

contributions to economic
analysis

János KORNAI

Economics of Shortage

Volume B

North-Holland

ECONOMICS OF SHORTAGE
VOLUME B

CONTRIBUTIONS
TO
ECONOMIC ANALYSIS

131

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NORTH-HOLLAND PUBLISHING COMPANY
AMSTERDAM • NEW YORK • OXFORD

ECONOMICS
OF SHORTAGE
Volume B

JÁNOS KORNAI
Professor of Economics
Institute of Economics
Hungarian Academy of Sciences



1980

NORTH-HOLLAND PUBLISHING COMPANY
AMSTERDAM • NEW YORK • OXFORD

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ISBN for Volume A: 0 444 85426 6
ISBN for Volume B: 0 444 86058 4
ISBN for both volumes: 0 444 86059 2

Publishers:

NORTH-HOLLAND PUBLISHING COMPANY
AMSTERDAM • NEW YORK • OXFORD

Sole distributors for the U.S.A. and Canada:

ELSEVIER NORTH-HOLLAND INC.
52 VANDERBILT AVENUE
NEW YORK, N.Y. 10017

Library of Congress Cataloging in Publication Data

Kornai, János.
Economics of shortage.

(Contributions to economic analysis ; 131)
Includes bibliographical references and index.
1. Scarcity. 2. Europe, Eastern--Economic
conditions. 3. Hungary--Economic conditions--
1968- I. Title. II. Series.
HC244.K66713 1980 330.947 80-19089

Printed in the Netherlands

Introduction to the series

This series consists of a number of hitherto unpublished studies, which are introduced by the editors in the belief that they represent fresh contributions to economic science.

The term 'economic analysis' as used in the title of the series has been adopted because it covers both the activities of the theoretical economist and the research worker.

Although the analytical methods used by the various contributors are not the same, they are nevertheless conditioned by the common origin of their studies, namely theoretical problems encountered in practical research. Since for this reason, business cycle research and national accounting, research work on behalf of economic policy, and problems of planning are the main sources of the subjects dealt with, they necessarily determine the manner of approach adopted by the authors. Their methods tend to be 'practical' in the sense of not being too far remote from application to actual economic conditions. In addition they are quantitative rather than qualitative.

It is the hope of the editors that the publication of these studies will help to stimulate the exchange of scientific information and to reinforce international cooperation in the field of economics.

The Editors

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Foreword

In 1976–77 I spent fifteen months in Sweden at the invitation of the Institute for International Economic Studies of Stockholm University. My work included a series of lectures held under the title “Economics of Shortage”. The present book has grown out of the notes of these lectures.

I have learned a lot from the discussions and arguments I had with the audience at my lectures, with my colleagues working at the Institute, and members of other universities and research institutes. I wish to express my thanks for stimulating questions and valuable remarks particularly to Åke E. Anderson, Rolf Eidem, Sven Grassman, Pentti Kouri, Harvey Lapan, Clark Leith, Assar Lindbeck, Erik Lundberg, Lars E. O. Svensson, Jörgen W. Weibull, and Bengt-Christian Ysander.

I remember with gratitude my Swedish hosts. The problems treated in my book became known to me while living in Hungary and participating actively in events. But a temporary leave and the distance away from my country made it easier for me to consider those problems thoroughly. The generous support of the Stockholm Institute allowed me an extended period to concentrate my efforts exclusively on writing this book.

I avail myself of this opportunity to express my thanks to all who helped me at home in Budapest in the final completion of the manuscript with editorial and technical assistance; in particular to Mariann Dicker, Zsuzsa Kapitány, Maria Lackó, Edit Makó, Péter Mihályi, Judit Szabó, and Teca Zimányi.

Ilona Lukács and György Hajdu cooperated with me in translating the book into the English language. The bulk of the work fell on Ilona Lukács. I am grateful for their care and devotion. I am indebted to Professor Paul Hare and Martin Cave (Stirling University, United Kingdom) for their extremely valuable help in correcting the English of the book.

Stockholm–Budapest, 1977–78

János Kornai

Notation

Symbols of real numbers are in italics, symbols of vectors in bold face italic type. An asterisk (*) added to the symbol of a variable denotes the *normal value* of the variable. A “hat” ^ over a symbol denotes an *upper bound*.

If the same concept occurs in several chapters of the book, it is given the same notation throughout. For these concepts parts of the Latin and Greek alphabets are used; their list is given below. The other Latin and Greek letters denote different concepts in different chapters of the book, but only such concepts as occur exclusively in an individual chapter. Even in these cases a particular symbol denotes the same concept throughout any one chapter.

Some of the symbols in the list denote concretely defined concepts. Others serve to denote *families of concepts*. For example, all kinds of shortage indicator are denoted by z . In individual chapters some category of shortage indicators is also defined in concrete terms, but the letter z will always be used as the symbol for any kind of shortage indicator. (Perhaps as a basic symbol, complemented by special notation, e.g. z_L is the symbol for indicators of labor shortage.)

The expression $\mathbf{x} \geq \mathbf{0}$ means that all components of vector \mathbf{x} are non-negative. The meaning of the expression $\mathbf{x} \geq \mathbf{0}$ is that all components of vector \mathbf{x} are non-negative, but at least one component is positive.

We shall use the following abbreviated notation:

$$(x)_+ = \begin{cases} x, & \text{if } x \geq 0, \\ 0, & \text{if } x < 0, \end{cases}$$

a = input coefficient,

c = cost,

d = demand,

g = consumption,

p = price,

P = price index,

q = slack,

s = supply,

t = time,

u = output stock,

v = input stock,

w = friction,

x = production,

y = trade, turnover,

z = shortage,

β = degree of the softness–hardness of the budget constraint,

ζ = rigidity parameter,

κ = degree of capacity utilization,

μ = forced substitution propensity,

ρ = resistance parameter,

τ = delay time.

PART II
ADJUSTMENT IN THE PRESENCE OF PRICES

Introduction to Part II

Part I of the book disregarded the roles of profit, prices, wages, and money; it is the task of Part II to draw these into the analysis. It is questionable how great their influence is. That is why Part II is not entitled “adjustment *through* prices”, but only: “...*in the presence* of prices”.

Chapters 13–15 deal with *firms* and at some places brief references are made to *nonprofit institutions* as well. The subject of Chapters 17–19 is the *household* sector. Chapter 16 falls between the two blocks, examining the wages paid by firms and nonprofit institutions to the household sector.

The last three chapters of the book cover all sectors. In Chapter 20 money is discussed, Chapter 21 treats macroeconomic interdependencies and, finally, Chapter 22 analyzes a few problems in the institutional background.

The firm: Budget constraint and profit

13.1. Introduction

In Part I of the book we referred several times to the role of the budget constraint in determining the behavior of the firm. Part II will start with a detailed examination of the firm's budget constraint and of profit, because the conclusion drawn therefrom will also serve as a basis for what we have to say about prices, wages, and finance.

In sections 13.2–13.6 we shall not continue our definitions and thoughts to either of the historically materialized systems. The question of the ownership of the firm is left open. The analytical tools thus developed will be used in sections 13.7–13.9 for the description of the various forms of the socialist and capitalist economies.

Finally, the last section of the chapter deals with general questions of theory and of the history of economic thought.

13.2. The financial balance sheet and budget constraint of the firm: Accounting interrelations

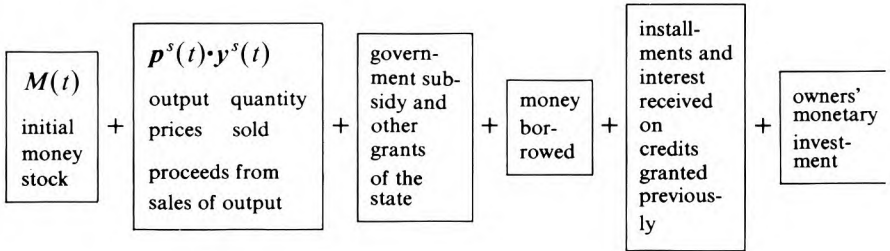
Formula (2.3) above outlined the meaning of the budget constraint. We shall now discuss it more comprehensively and in more detail, although we shall not go into too minute a description of the monetary and fiscal system.

For the time being it is assumed that the firm has a *single* financial balance sheet and together with it a single budget constraint. The money is not “labelled” so that one “cash-box” is for payment of wages only, another one for investment expenses, and so on. Once in the firm's possession, money can be spent on anything.

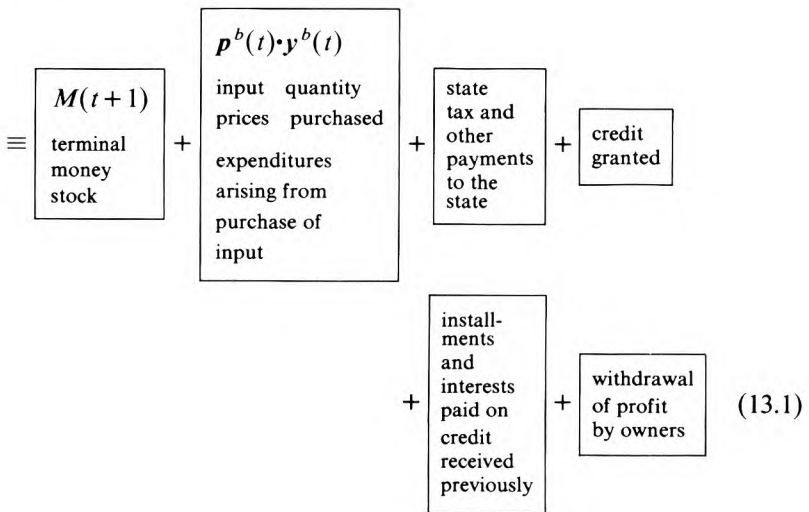
It follows from this that we do not distinguish expenditure of the firm in connection with investments from that on current production. Both investment and current production continuously require inputs to be purchased with money.

The *financial balance sheet* of the firm for a definite period (e.g. for a day) is as shown in (13.1).¹

Receipts



Payments



¹Most items in the balance are given only in verbal form. Symbols are used only for variables to which reference will be made later.

Formula (13.1) speaks for itself, and only two of its items need some explanation. One is M , the *money stock*. This corresponds roughly to category M_1 in monetary theory: it is the money stock of which the firm disposes directly and immediately, whether it keeps it in cash or in bank deposit available for withdrawal at any time. The stock of less liquid assets does not appear in the balance, but it is only the *change* in stock (i.e. a flow) that figures in the appropriate credit operations.

Since the question of ownership has been left open for the time being, it also remains an open question who can invest money in the firm, and also, how investment depends on the possibility of the withdrawal of profit. In cases where the owner is the state, two items of the “Receipts” side (“government subsidy” and “owners’ money investment”) virtually coincide.

The financial balance sheet (13.1) is an *ex post accounting identity*, which always holds by definition. This does not mean that the firm is always solvent. If, however, it does not pay for the goods delivered – in spite of the contract signed with the seller – it takes in fact a credit. Thus, the balance sheet identity does hold, since the item “money borrowed” contains not only credit granted willingly by the creditor, but also the credit forced out by violation of the contract of payment.

Since every variable of the financial balance sheet (13.1) is non-negative, the following inequality holds:

$$\begin{array}{|c|} \hline \text{Total payments} \\ \text{in the} \\ \text{rth period} \\ \hline \end{array} \leq \begin{array}{|c|} \hline M(t) \\ \text{initial money} \\ \text{stock} \\ \hline \end{array} + \begin{array}{|c|} \hline \text{Total receipts} \\ \text{in the rth} \\ \text{period} \\ \hline \end{array} \quad (13.2)$$

To avoid repetition, we shall not discuss in detail the receipts and payments in the inequality; they can be read from formula (13.1). The inequality (13.2) is the aggregate *budget constraint* of the firm. The adjective “aggregate” indicates that *total* receipts of the firm put a constraint on *total* payments.² Since it has been deduced from an *identity*, obviously the budget constraint in this general form always holds.

²Whenever we use the expression “budget constraint” without qualification, it always means the *aggregate* constraint. If we wish to talk about a constraint with a narrower scope (for example the budget constraint for investment expenditure, or a constraint on wage outlays), we shall always specify what we mean.

13.3. Hard budget constraints: The pure case

In what circumstances does the inequality (13.2) express not a mere *accounting* relationship that holds in all cases, but a *constraint actually restricting the behavior and freedom of action of the firm*? For this to happen the variables of the inequality must not be able to assume arbitrary non-negative values; their domain must be limited not only by the feasibility constraints of the real sphere but also by the internal regularities of the control sphere, its institutional arrangements, and the behavioral regularities of micro-organizations. Below we shall analyze these institutional arrangements.

First we examine the *pure* case of a *hard* budget constraint. We shall indicate five conditions the fulfillment of which guarantees hardness of the constraint. A theoretical construction is presented; one or other of the five conditions is never perfectly satisfied in reality. This will be explained in subsequent sections.

The five conditions together are sufficient to guarantee *perfect* hardness of the constraint. We do not claim that only this set of conditions guarantees it. However, these five conditions provide a good starting-point for further steps in our reasoning. To facilitate subsequent comparisons we shall add the letter H (hard) to the serial numbers of the conditions.

Condition 1-H. Exogenous prices. The vector of purchase prices for inputs, \mathbf{p}^b , and that of the selling prices for outputs, \mathbf{p}^s , are given for the firm. The firm is a *price-taker* and not a *price-maker*. From this point of view it does not matter who determines the price: an atomized market process that cannot be influenced by a single buyer or seller; a seller more powerful than our firm in fixing the purchase price, or a buyer more powerful in fixing the sale price; or a state authority. It may be anybody; the main point remains that our firm is unable to influence the price.

Condition 2-H. The tax system is hard. This does not mean that taxes are high, but that the following principles are strictly observed:

(a) The formulation of tax rules (laws, regulations) cannot be influenced by our firm; they are given exogenously for it.

(b) The tax system links taxes to various objectively observable and measurable criteria.

(c) The firm cannot receive any individual exceptional exemption.

(d) The tax imposed is collected unconditionally on the prescribed terms.

Condition 3-H. No free state grants. The state does not give any grants to cover current expenses, nor make any free contributions to investment.

Condition 4-H. No credit. All inputs purchased, $p^b \cdot y^b$, must be paid for exclusively in cash. Interfirm credit cannot be taken up either by agreement with the seller, or by breaking the contract, failing to make payments and thus forcing the creditor's role upon him. Nor can credit be obtained from any other source.

Condition 5-H. No external financial investment. Our argument does not cover the foundation of the firm, that is the question of how the initial financial investment in the firm was made. We consider only existing firms. Condition 5 says: the owners can draw profit from the firm. Yet if they do so, they cannot re-invest it in the firm.

Conditions 4-H and 5-H can be fully satisfied only in the abstract case of a strictly stationary economy.

Conditions 1-H to 5-H set *ex ante* behavioral constraints on the variables figuring in the financial balance (13.1) of the firm. In cases where these constraints are strictly observed, (13.2) summing up their effect will actually limit the firm's freedom of choice; that is to say, the budget constraint will become an *ex ante* hard behavioral constraint.

Let us now examine the implications of these five conditions.

How does hardness of the budget constraint manifest itself? (We shall again add the letter H to the serial numbers.)

Consequence (i-H): Survival. The firm's survival depends exclusively on the proceeds from sales and on the costs of inputs. If, for a short time the latter is greater than the former, the firm can avail itself of its money stock M to cover the loss, and can renounce the withdrawal of profit. But, if it has fully renounced the withdrawal of profit and used up its money stock and the loss is still not eliminated, it is compelled to reduce its expenditures. Fewer inputs lead to less output, proceeds will decrease, and finally the firm becomes insolvent and goes bankrupt. *The hard budget constraint is a form of economic coercion: proceeds from sales and costs of input are a question of life and death for the firm.*

Consequence (ii-H): Growth. Technical progress and growth of the firm, which require investment, depend on the same factors. *Financial resources to purchase additional inputs necessary for expansion of the firm are created exclusively by internal accumulation within the firm.*

Consequence (iii-H): Adjustment to prices. Prices being given exogenously, *the firm must adjust to prices.* Adjustment must be performed basically by *real* actions, first of all by increasing or reducing the level of production, or by modification of the input-output combination. These changes are internal to the producing plant and are not therefore directly linked to prices. Indirectly, however, they are all the more closely connected to

them, by purchases of input y^b which permits modifications in production, as well as by sales of output y^s which is made possible by modifications in production.

The firm may be helped in its adjustment by two *internal* financial variables: it may use its money stock M and it may reduce or suspend the withdrawal of profit. The money stock, however, may be exhausted, and withdrawals of profit can only be reduced to zero. The firm cannot maneuver by using *external* financial resources. Finally, therefore, no other means is left than to adjust through *real* actions.

Under such circumstances price is not merely a “signal” which the firm observes in controlling real actions if it feels like it, but need not observe if it does not feel like it. It *has to* observe it because otherwise it will be incapable of development or expansion, and might even go bankrupt.

At this point we can entirely ignore the properties of prices. “Optimal” prices or “nonoptimal” ones, “equilibrium” prices or “nonequilibrium” ones—it is all the same from the point of view of *hardness* of the budget constraint. It matters only that prices do not depend on the firm and that in the case of a hard constraint the firm has to adjust to them.

Consequence (iv-H): Uncertainty. The firm does not share its risks. It bears the consequences of external circumstances as well as of its own actions.

Since prices are exogenous, they may bring disaster or good luck for the firm. In either case it will be the firm’s own bad or good luck. If it is bad luck, nobody will help it to get out of it; if it is good luck, nobody will skim off the result.

Consequence (v-H): Demand of the firm. The consequences enumerated above together imply that the firm’s *demand for inputs is finite*. It depends closely on the purchase price of inputs p^b , and on the current and expected income $p^s \cdot y^s$ of the firm.

13.4. Almost-hard budget constraints

In every actual economic system there are several phenomena at work which may shift the budget constraint from the pure case of perfect hardness as described above. We shall discuss these in more detail in a later part of the chapter, but we wish here to mention a few of them.

(1) As a consequence of concentration in production, huge firms are created. One indication of their power is that they are not content with the role of price-taker but participate actively in making prices.

(2) As the social and economic activity of the state expands, its role in redistributing the financial receipts of firms also grows.

(3) Ever since firms have existed, a credit system has also existed. Firms can pay each other not in cash only; creditor–debtor relations also developing among them. A firm may receive credit from the banking system.

(4) Money holders can invest money—within the given organizational forms and institutional constraints—in the foundation of firms, or in the enlargement of existing firms.

The phenomena listed above imply the *possibility* of softening of the budget constraint. Yet the extent to which this possibility becomes *reality* depends on the special features of each system. We shall examine below under what conditions the budget constraint should be at least *almost-hard* despite the phenomena mentioned above. (The letters AH following the serial numbers of the conditions indicate the qualification “almost-hard”.) The expression “almost-hard” indicates that although the constraint is not so hard as in the theoretically pure case, it is approximately hard. This will be indicated by the *consequences*. A budget constraint is almost hard if it causes the consequences (i-H)–(v-H) of the preceding section. Again we shall be content to give a set of *sufficient* conditions; there may be other sets of conditions able to cause consequences (i-H)–(v-H).

Condition 1-AH: Price-making within narrow limits. Some of the firms are price-makers for some inputs and outputs. However, in deciding on prices they are constrained by the resistance of their trading partners and, finally, by the level of total demand.

Conditions 2-AH and 3-AH: No state redistribution. Here conditions (2-H) and (3-H) of the pure case must fully stand. The state cannot redistribute the financial receipts of firms either by differentiating taxes and other methods of skimming off profits, or by subsidies and other grants.

Condition 4-AH: Credit on hard conditions. This does not mean that the creditor demands high interest, but that certain *principles*—which are “orthodox” and “conservative”—are employed in granting credit:

The creditor (bank, etc.) grants credit to a firm only if it is fully guaranteed that the firm is able to repay it from the proceeds of its sales of output. That is, credit is an “advance payment”.

If the firm has taken a loan, it must always fulfill every obligation in the credit agreement: instalments must be paid on time, and interest must be added according to the agreement. The adherence to credit agreements is enforced with the full rigor of the law.

The buyer cannot force the seller to grant credit by failing to pay immediately—without preliminary agreement—for the goods delivered.

Condition 5-AH: External financial investment on hard conditions. The internal financial resources of the firm can be supplemented by monetary

investment by the owners. This may finance only technical progress and expansion of the firm and must be reimbursed from increased proceeds. No external financial resource can be used to surmount short-run financial difficulties.

We wish to avoid repetition. Reconsideration of what we said in the preceding section can convince the reader that consequences (i-H)–(v-H) listed there will occur in this case too. It must be added, however, that they cannot be guaranteed as strictly as in the theoretically pure case. It is true that conditions 2–3 have not changed: the possibility of state redistribution is still excluded. Yet even so difficulties may arise with conditions 1, 4, and 5. They deal with phenomena about which a simple “yes or no” statement cannot be made. We cannot say, for example, that credit is given either on hard or on soft conditions. There are many intermediate degrees possible. The situation is the same with price-making or price-taking, as well as with the hardness or softness of external financing conditions.

Intermediate cases will be discussed in section 13.6. At this point, however, we shall omit them and discuss the other extreme: soft budget constraints.

13.5. Soft budget constraints

When can we say that the budget constraint has become totally soft, that is it does not bind *ex ante* the freedom of choice of the firm? We shall go over the five conditions discussed in previous sections. (This time we shall put a letter S after the serial number.) In fact, a single condition—or perhaps even a single part—is sufficient to render the constraint soft, though usually several conditions apply simultaneously.

Condition 1-S: Price-making. The majority of firms are not price-takers but price-makers. Price is not exogenous for most firms.

Theoretically this could be the case on both sides of the market: in input prices as well as in output prices. In practice, however, it is usually the latter which soften the budget constraint. The firm is able to impose its own cost increases on the buyer. This may be because, in the case of free contract price, it is the seller who is stronger than the buyer. (For example, it is a large monopolistic seller faced with many scattered buyers. Or, there may be chronic shortage, and it can dictate the price for this reason.) Or it can influence the price because, although it is formally determined by an administrative price authority, the firm has a large influence on the authority’s decision.

Continuous imposition of all costs on the buyer is made possible ultimately by the fact that total demand in money terms is not strictly limited but adjusts more or less passively to the rising level of costs.

We shall revert to several aspects of this problem in subsequent chapters.

Condition 2-S: The tax system is soft. A few of its characteristic manifestations are these:

- (a) the formulation of tax rules is influenced by the firm;
- (b) the firm may be granted exemption or postponement as an individual favor; and
- (c) taxes are not collected strictly.

Condition 3-S: Free state grants. The firm can get these in various favors:

- (a) contributions to investment expenditures, without repayment obligations;
- (b) permanent subsidies paid continuously in compensation for a lasting loss or to encourage some activity over a long period; and
- (c) *ad hoc* nonrecurrent subsidies to counterbalance an occasional loss or to encourage a special activity.

Condition 4-S: The credit system is soft. It does not follow “orthodox” and “conservative” principles.

The firm is granted credit even if there is no full guarantee of its ability to repay it on schedule from its proceeds from sales. Credit is not strictly an “advance payment”; its granting is not closely related to expected production and sales.

The firm is permitted to fail to fulfill its repayment obligations undertaken in the credit agreement. Moreover, the firm, in the role of buyer of inputs, is allowed arbitrarily to postpone payment without previous agreement with the seller.

Condition 5-S: External financial investment at soft conditions. In the case of a firm in state ownership this cannot be distinguished from condition 3-S, free state grants. Phenomena of this kind may also be observed with private enterprise: owners invest money from their own resources in the firm—not in order to develop and enlarge it but to help it out of its financial difficulties.³

We can now contrast the accompanying phenomena and direct consequences of a soft budget constraint with those of a hard one.

Consequence (i-S): Survival. Survival of the firm does not depend only on whether it is able permanently to cover the costs of its purchases of

³For example, a family enterprise in difficulties which the owners try to refloat at the cost of their personal wealth. This is, of course, limited by the size of that wealth.

inputs from the proceeds of its sales. Even if the former permanently exceed the latter, that may be counterbalanced by tax exemptions, state subsidies, soft credit, etc. The difference between the proceeds from production and the costs of production is *not a question of life and death*.

Consequence (ii-S): Growth. Technical progress and growth of the firm do not depend solely on whether it is able to raise the financial resources for investment from *internal* financial accumulation (whether from its money stock, i.e. from savings from previous profit, or from hard investment loans which have to be repaid later from its own receipts). The financial resources needed to buy additional inputs for development and expansion may be provided by the state in the form of free subsidies or soft investment credits.

Consequence (iii-S): Adjustment to prices. The firm is not compelled to adjust to prices under all circumstances, for two reasons.

Either the budget constraint has softened as a consequence of above-mentioned condition 1-S. The firm is not a price-taker but a price-maker. For example, let us take the case when it is able to influence the selling price of its own product. It need not take much notice of the relative prices of inputs. However much they change, it will be able to adjust the selling price of its own products to cover cost increases.

Even if this factor does not operate and the firm is a price-taker, it still does not have to adjust to prices by altering its input-output combination. Even if it disregards prices and suffers losses as a consequence, these may be compensated for by remission of tax, state subsidy, postponement of credit repayment, extra credit granted under soft conditions, and so on.

Survival and growth of the firm do not depend on prices. The firm takes note of prices if it feels like it and does not take note of them if it does not feel like it. In the latter case it can still survive and even expand.

The firm may react to changes in prices in its *real actions*, namely, by a suitable change of its input-output combination. This changes the real quantity of inputs purchased (y^b) as well as the real quantity of sales (y^s), and thereby affects the firm's financial situation. Yet the firm may also react in another way. It may try to influence prices p^b and p^s , as well as the financial variables (tax, state subsidies, credit terms, etc.).

In the first case the firm reacts in the real sphere, in the second case in the control sphere. In the first case it acts in the *factory*, in the second case in the *offices* of the ministry, the tax authority, or the bank. In the first case the main element in the reaction is *production*; the adjustment of the input and output combination to the new situation. In the second case the main elements are: requests, complaints, and bargaining—in other words,

attempts to *manipulate* all those on whom tax remissions, subsidies, soft credit, and so on, depend.

Softening of the budget constraint does not exclude the first reaction, but it does not enforce it either. At the same time it offers large scope for – and even temptations to – the second kind of reaction.

Consequence (iv-S): Uncertainty. The firm does not bear risk alone, but shares it with the state. If circumstances develop favorably, it cannot be sure that it can keep the additional profit: probably it will be skimmed off. However, if it has bad luck, or cannot adjust itself adequately to conditions, it will probably be able to shift the consequences onto somebody else: onto the buyer by a price increase; onto the creditors; and primarily onto the state.

The financial situation of the firm and its budget constraint suffer from a double uncertainty. One is the kind of uncertainty that is present for every firm (also that with a hard budget constraint): prices and markets are uncertain. In addition, uncertainty is also caused by the continuous redistribution of the financial receipts of firms. The firm cannot foresee exactly how much the state will take away from it, or how much it will give.

Consequence (v-S): Demand of the firm. As a result of the consequences enumerated above the *demand of the firm for inputs is almost-insatiable*. It does not depend either on the purchasing price of inputs p^b , or on current and expected income $p^s \cdot y^s$ of the firm. Sooner or later it can expect to be able to cover its costs on inputs; and, if its proceeds from sales of outputs are not enough, it will be able to cover costs from an external financial source.

After all, a soft budget constraint does not bind the firm in its action in the real sphere, namely production and trade. *The soft budget constraint – as opposed to the hard one – is unable to act as an effective behavioral constraint, but exists only as an accounting relationship.*

13.6. Elementary events and general behavior

In previous sections we have considered the factors that harden or soften the firm's budget constraint. These factors influence the life of the firm at the submicro-level, through millions of elementary events. Objective events take place which are subjectively *perceived* by decision-makers in the firm. The latter are affected not only by their own experience, but also by their observation of other firms. Finally, all these experiences form *expectations*.

The hardness or softness of the budget constraint reflects what the manager of the firm expects for the future. The more he expects that the existence and growth of the firm will depend *solely* on production costs and on proceeds from sales, the more he will respect the budget constraint, and therefore the harder that constraint will be. And the less he expects this to be so, the less seriously he takes the constraint, the softer it will become.

It follows—as we noted earlier—that the constraint need not assume one of only two different values: *either* hard *or* soft. There are also intermediate stages, for two reasons. First, one or other decision-maker may himself expect an intermediate value. Secondly, within the same system the expectations of different decision-makers may vary; some expect a harder budget constraint, others a softer one.

There are, however, tendencies that lead toward uniform and extreme expectations. If an event occurs frequently enough which gives the impression of a soft budget constraint, and if its frequency goes beyond some critical value, a “public opinion” will develop that regards the constraint as soft.

The degree of hardness of the budget constraint is *observable and measurable*. Since it is a very complex group of phenomena, it cannot be described by a single cardinal indicator. It can only be measured ordinally, by several indicators together. Let us denote by β the vector of indicators of the hardness of the budget constraint. According to the notation conventions of the book followed so far, $\beta_i = 0$ should represent that state of the phenomenon described by the *i*th indicator corresponding to perfect hardness of the constraint. The softer the constraint, the higher the positive value of the indicator.

Some of the indicators may be based on *subjective* observation: the expectations of managers of firms about factors influencing their financial position and the role of the financial position in determining their choice of action can be found out through interviews. The interview method is indispensable, in spite of its uncertainties, since it can provide important clues for judging the situation.

We can infer the degree of hardness of the budget constraint from the *consequences* of the hardness or softness of the constraint. (See in the preceding section the items listed as (i)–(v).) We shall consider three different phenomena, well observable and quantifiable by *objective* methods.

State redistribution of the firms' receipts. This can be described by numerous kinds of indicator. What is the relation of money drawn away

from the firm under various titles to the amount granted to the firm also under various titles? What is the frequency of state interventions drawing away money from and granting money to firms? What is the ratio of interventions announced previously to those not announced, and so on?

The financial situation and the survival of the firm. What is the relationship between short-run or permanent financial loss of the firm and its survival? How frequent are bankruptcies and financial rehabilitations; what is the distribution of bankruptcy among the different types?

The financial situation and the expansion of the firm. What is the relationship within the firm between genuine profits (or losses) arising from differences between proceeds and expenditures on the one hand and investment carried out in the firm on the other hand? This partly overlaps with the observation and measurement of the state's redistribution of financial income mentioned under the first paragraph.

A single event in each of the three groups of phenomena listed above can be described more or less with certainty. Regarding the economy as a whole they are, however, *stochastic* events. In measurement we must strive for a *statistical description*, characterizing their probability distribution.

By making observations over a longer period the *normal degree* of hardness of the firm's budget constraint within the system can be established for given social conditions.

13.7. Observations about capitalist and socialist economies

Up to this point in the present chapter we have discussed the budget constraint on an abstract level. We wished to elaborate the *analytical tools* (concepts, relations of cause and effect, principles of observation and measurement, etc.), for the examination of historically materialized specific systems. Now, in possession of the analytical tools, we shall begin to tackle this task.

First of all we shall make a few remarks about the hardness of the firm's budget constraint in a *capitalist* economy. Differences between countries are considerable. Nevertheless looking back over a long period a common trend is evident.

The normal degree of hardness of the constraint seems to have shifted: *the trend is in the direction of softening*. Perfect hardness in its absolute purity may never have existed, even though the capitalist system came close to this abstract extreme point, that is to the state $\beta=0$, in the nineteenth century. Bankruptcy was real bankruptcy; the firm that failed

was not helped out by anyone but crushed ruthlessly by more successful competitors. The receiver selling up the bankrupt businessman's personal belongings and the debtor's prison were symbols of the hard system of taxation and credit. With a few exceptions (the railways, shipping, insurance, a few big companies engaged in colonial trade) firms were not big; prices were in fact formed mainly by anonymous market processes and were thus given exogenously for the firm.

Significant changes have taken place since the initial period of classical capitalism, and these move the degree of hardness of the budget constraint away from the extreme point $\beta = 0$. Although they are well known, we shall briefly review them.

The economy is becoming highly concentrated; huge corporations are being founded. They are no longer price-takers, but price-makers. This is one of the basic factors from the point of view of softening the budget constraint. A large capitalist corporation is able to react to input price changes not by adopting its input-output combination, but by adjusting output price to actual costs plus the expected mark-up. By its price-making power it can almost "automatically" guarantee its survival, its self-perpetuation.

Historical experience draws the attention of society towards employment, and not only the attention of workers directly suffering from unemployment but also the attention of capitalists and other strata of society. Bankruptcy is not solely a problem for the capitalist owner, since it always affects employment. Workers in the shut-down factory are dismissed. What is more, modern economics has shown that there are multiplier and accelerator effects; every bankruptcy reduces aggregate demand, thereby endangering employment at other places as well. It is not only the owners who are involved, but trade unions as well, and almost the whole society presses the state to save the threatened firm: it should be given a tax allowance, subsidy, and credit with governmental guarantees. Rescue action sometimes takes the form of nationalization.

Protectionist state intervention is growing in numerous fields. The state protects domestic companies left behind in international competition, if their performance either in exporting or in import substitution is weak. For various sociopolitical reasons it subsidizes unprofitable products and services.

The growth of a firm depends not only on its success in atomistic markets but also on its power: the pressure it can put on its business partners, the connections it has with banks and, last but not least, the extent to which it can influence state decisions, taxes, subsidies, and government orders.

Principles of credit are softened; in the Keynesian spirit they deviate from “conservative” and “orthodox” principles. A budgetary deficit is deemed to be permissible and even desirable in certain conditions. There develops an “overdraft economy”:⁴ money is created to increase demand.

We repeat that all the above-mentioned phenomena are well known from Marxist literature⁵ as well as from works of non-Marxist economists.⁶ Here we have collected them according to a single criterion: we wished to point out that these processes all contribute to the softening of the capitalist firm’s budget constraint. Today’s capitalist firm does not react to circumstances merely through *real* actions. The bigger and more powerful the firm, the better our observation applies. The firm can influence its life in numerous other ways: from price-making to “lobbying” the authorities.

As regards the degree of hardness of the budget constraint of the capitalist firm, no general proposition can be made. The normal degree of hardness is different in each country, depending on the level of concentration, on the economic activity of the state, and on other social factors. It also varies within one country; it is different for the powerful and the weak firm. There is a sphere in which it could be said that the budget constraint is still “almost-hard”, and other spheres where it is “not very hard” or “rather soft” – although nowhere under capitalist conditions has the budget constraint reached full softness, with an automatic guarantee of the firm’s survival.

It is not the task of the present book to analyze in more detail the position of the capitalist economy. We have gone into the question this far mainly to avoid distorted comparison. We may compare theoretical cases: the “pure hard” and the “pure soft” budget, as defined at an abstract level.

⁴See Hicks (1974a, b). In banking terminology it is an “overdraft”, for example if the owner of an account pays with a cheque when there is not enough in his account to cover the cheque.

⁵The historical importance of the concentration of capital was first stressed by Marx (1867–1894a, b), and later it played an important role in the thought of Hilferding (1910), Lenin (1917), and Luxemburg (1913). Amongst Marxist literature on the role of the modern capitalist state see also the works by P. Erdős (1966, 1971, 1976).

⁶The price-making role played by the big firm was first stressed in the literature of imperfect competition; starting-points were works by Robinson (1933) and Chamberlin (1933). Monopolistic competition is described with the aid of modern mathematical formalism by Nikaido (1975a, 1975b). The work of Galbraith (1967, 1970, 1973) on the relation between the contemporary capitalist corporation and the state raised great interest.

The basic source on active government economic policy pursued in the interest of full employment is Keynes (1936a, b); related pro- and anti-Keynesian literature is plentiful. The neoliberal school must be mentioned especially: Hayek, Friedman and their followers who, while feeling nostalgic about the classical free market period, point out sharply several aspects of the softening budget constraint. (See, for example, Friedman, Hayek et al., 1974; Friedman, 1977a; Hayek, 1944.)

Or we may compare one *real* system with another *real* system. And in this case we must compare the empirically observable behavior of the modern capitalist firm with what we can also observe empirically about the socialist firm. In respect of the latter our main hypotheses are as follows:

(1) *In the traditional socialist economy the budget constraint of the firm is soft.*

(2) *A partially decentralizing reform like the 1968 Hungarian reform shifted the normal degree of hardness of the firm's budget constraint – but only a little. The constraint remained basically rather soft.*

These hypotheses require *thorough empirical testing*. The observations in this book do not have the force of proof. Rather, the subsequent parts of the chapter give an account of some evidence that seems to support hypothesis (2).

I do not discuss hypothesis (1) (traditional firm). But our observations in connection with hypothesis (2) will also indirectly support hypothesis (1).⁷

13.8. Reasons for and consequences of the redistribution of firms' financial receipts

In commenting on the situation after the Hungarian reform of economic management we shall focus our attention on the state's redistribution of the financial receipts of firms.⁸ First we discuss financial matters linked with *current production* and later on come to the subject of investment.

Let us call *gross profit* the amount which remains from sales revenue after deducting expenditure on inputs, as well as due repayment of debt and payment of interest. This amount must be used to cover taxes and other payments into the state treasury; it is used to increase *M* the money stock of the firm, and within *M* to augment funds for the self-financing of investments, and also for what we called "withdrawal of profit" in balance (13.1), namely the profit share to be paid to workers, and contributions to various social funds, and so on.⁹

Part of the gross profit is taken away from each firm under various titles, and given to other firms under various other titles. The redistribution is

⁷An indirect conclusion, based on the logical principle *a fortiori*. If we agree that the postreform firm's budget constraint is rather soft, then the prereform traditional firm's budget constraint must be *even softer*.

⁸Polányi (1944, 1976) considers the *redistribution system* a fundamental form of the organization of socioeconomic activity, which he contrasts in his own terminology with the market.

In the post-reform system of economic management both the market and redistribution by the state exist and are interwoven.

⁹I do not adopt the frequently changing terminology of Hungarian business life, but I use the terms as defined in the present chapter.

carried out by different authorities (tax offices, custom-offices, price authorities, other financial agencies, industrial and foreign trade management authorities, etc.) through various money-flow channels. Therefore, it may also happen that while one authority draws money away from a firm, under one title, the same firm is given money by a second authority under another title. (The firm pays tax, but receives a foreign trade subsidy.) In any case, the final result is that *the share of gross profit redistributed under various titles through all the channels is very high in relation to total gross profit; it is more than half at least.*¹⁰

The credit system plays an important role in this redistribution. Banking has remained strictly centralized even after the reform. At this point we mention it only for the sake of completeness, and shall treat it in more detail in Chapter 20.¹¹

Redistribution takes place by means of several thousands of measures of greater or lesser importance, through occasional partial actions and regulations operating on a larger scale and more permanently. Each measure can be justified by some specific reason. Behind the various direct reasons, however, there lie *deeper and more general motivations.*¹² Without seeking completeness we shall single out three.

One of the most important motives is the search for *stability*, which implies “stabilization” of every firm, and even of every job. Activities must be aided which are not profitable, or not profitable enough.¹³ The effect of this effort is contradictory. On the one hand it substantially reduces insecurity. Anxieties about failure of the firm disappear; neither managers

¹⁰In the 1970s a rich empirical literature was written on the subject. On financial subsidies to firms and their relation to prices see Deák (1972a, 1972b), (the latter work contains exceptionally plentiful and valuable material), Bauer (1975a, 1978), Szabó (1977), and Vincze (1971).

¹¹On the credit system see Tallós (1976, pp. 47–48, 181–182).

¹²The author’s article “Is Profit Sharing to be Corrected?” (Kornai, 1958) called attention to the problem ten years before the reform, after early experience following the introduction of profit sharing.

¹³The idea can be illustrated by two quotations.

“...indirect forms of support are also considerable. In a number of fields (sectors, subsectors, firms) the state exempts certain activities from charge, or requires only reduced payments of charges on assets or wages; moreover, it grants tax allowances, and offers advantageous terms for credit repayment and interest... Although between 1968 and 1970 the sphere of exemptions was restricted, since then exemptions and allowances have constantly increased. The main purpose of such preferential treatment is to maintain activities not profitable enough in themselves”, from a book by Minister of Finance L. Faluvégi. (See Faluvégi, 1977, p. 119.)

“Exceptions to the general rules of credit (preferential treatment, corrections, etc.)—both for short- and long-term credits—are made mainly in the case of firms that cannot satisfy, temporarily or permanently, even average requirements, or in the case of those wishing to be free from the consequences of inefficient activity in the past”, says Tallós (1975a, b).

nor workers need be afraid of bankruptcy. Not only is employment guaranteed, but even the actual place of work. The state functions as a universal insurance company which almost fully compensates every loss, even if occasionally only after some bargaining. On the other hand, so much security is debilitating. In fact, the firm does not need to struggle to survive.

Another important motive is the wish for equality of income and to assert the principles of socialist wage determination. The traditional postulates of socialist distribution are the following: "to each according to his work," and "equal pay for equal work". It follows logically from these postulates that income differences are only justified where there is a difference in performance, that is in contributions to social welfare. On the other hand, all differences are unjustified when their source is good luck or bad luck, the favorable or unfavorable development of external circumstance independent of performance. Why should workers of a factory suffer if the prices of its products have decreased in the world market? If, therefore, trouble hits the firm which is not a consequence of mistakes by managers or workers of that factory, the firm must be compensated. The burden of "objective" difficulties cannot be borne by the firm alone, it has to be shared with the whole of society. The logical conclusion of this train of thought is the following: in any such case the firm is *entitled* to subsidy, state price support, or the adjustment of the centrally fixed price. And if this must be granted in one place, then resources have to be taken away from another. But this is not the only reason for reducing higher incomes. The aim of equalizing incomes always implies the condemnation of excessive incomes.

The results of striving after equality of incomes are contradictory, just as those of the striving after stability are. On the one hand it satisfies the sense of justice of many. On the other hand it weakens the incentive effect of profit, prices, and costs.

Finally, there is one more motive possible: *strengthening the importance and social role of authorities performing redistribution*. In case of a hard budget constraint the firm is *economically* dependent upon the market. On the other hand, a soft budget constraint and large-scale redistribution of financial incomes of firms strengthen the *administrative* dependence of the firm on the redistributing authorities. In the traditional system of economic management, as was pointed out in Chapter 3, *plan bargaining* took place between central authorities and firms. Now this has been replaced by *redistribution bargaining*: the firm is bargaining with authorities in order that the latter should take away less money from it and give more.

We now go on to discuss redistribution connected with *investment*; here we meet with phenomena similar to those which we examined in treating financial aspects of current production.

The firm finances a minority of investment from its own savings; financial resources for the majority are provided by central credit and state investment. The proportion of projects financed exclusively by savings of the firm is relatively small. Even if the firm uses self-financing as one of the resources, it still needs credit or central subsidies as a complementary resource.

All this gives the central planning and financial authorities a large role in redistributing financial resources for investment. At the sectoral or subsectoral levels there seems to be positive correlation between the profitability of a sector or subsector, and its share in investment or the rate of growth of investment.¹⁴ There is some, but only slight positive correlation in more disaggregated analysis at the firm level.

13.9. Countertendencies

While very strong tendencies operate towards a softening of the firm's budget constraint, there are also countertendencies.

These appear partly in the behavior of *central* authorities. Profitability is considered in many different kinds of decisions—granting credit, planning foreign trade, making investment decisions—if not as a primary, but at least as a secondary criterion. As a consequence of the reforms the weight of the profitability criterion has grown.

Tendencies counteracting the softening of the budget constraint also appear in the behavior of the *firm*. The most important motive in this regard is the demand for *independence*. It is not a good feeling to ask for something. Subsidies, state price support, and investment contributions can be received through “lobbying”; bargaining and fighting take place to obtain funds, and this often puts the manager of the firm in an awkward situation. He feels at the mercy of those from whom money must be obtained. The behavior of the firm's representatives is not uniform from this point of view. Some are less embarrassed by this “client–patron” relationship, others more so. The latter try to remain within the budget

¹⁴See Tallós (1976, pp. 259–270).

constraint rather than to extend it. In other words, they are more affected by the constraint.¹⁵

Among the forces operating against softening of the budget constraint are *material incentives linked to profit*; for example the managers' bonus, the profit share of the staff which complements wages, and the size of the firm's welfare funds may depend on the profit. Material incentives acting in this direction were less emphasized before the reform, than after it.

It happens – though only occasionally – that where firms work at a permanent loss a thorough investigation and later a so-called “reorganization process” are started; managers may be relieved and new ones appointed. The knowledge that serious and permanent losses may have such consequences certainly exerts its effect towards hardening the budget constraint.¹⁶

The existence of counteracting tendencies entitles us to formulate the second hypothesis as follows: the reforms *have hardened* budget constraints *a little*.

One more remark on the subject is in order. It will strike those acquainted with the literature on the reforms that we have touched upon a number of questions that are amply discussed in the literature. Yet the focus of the reform dispute in this connection was “profit-incentive”, whereas in this book the focus is on “softness of the budget constraint”. This would not be worth mentioning if it were just a terminological difference. In that case the book might be blamed for changing terminology unnecessarily.

Yet the issue here is not merely a change of words, but differences in the logic of the argument and in the order of importance of the explanatory factors. The fact that the owners, managers, and workers of a firm are

¹⁵The behavior of firms in the various sectors differs to a certain extent. The sectors that have priority in central economic policy are more readily granted allowances and benefits. Firms in sectors more in the background feel that the budget constraint is harder, and may therefore be more ready to economize on costs.

¹⁶It is questionable how much such a reorganization undermines the feeling of security which we described in the preceding section in the following words: knowledge that the survival of the firm is guaranteed. We recall what was said in section 15.6: the gravity and frequency of events must reach a certain critical value to change public opinion. It is my impression that this critical value has *not* been reached in Hungary. Permanent losses do not give rise to any genuine sense of threat. That is why they do not lead to a greater increase in the normal degree of hardness of the constraint.

To support this impression of mine a single comparison may be enough. I quote from an article in an American weekly about Japan: “...the combination of slow economic growth, competition from abroad and the rapid appreciation of the yen has proved fatal to many companies... Last year, a record 18,000 companies went bankrupt... the transformation may be painful...” (Nagorski, 1978). In Hungary scarcely any firms have gotten into a situation which could be called a genuine “financial failure”.

interested in increasing profits does not in itself determine their behavior. When profit incentives are combined with a hard budget constraint, efforts are directed towards the line of real actions. Combining profit incentives with a soft budget constraint gives at least an equal role to the manipulation of financial variables, price increases, running after state donations, etc.

The crucial question affecting the situation of the socialist firm is not whether the managing director's personal share in the profit amounts to zero, 10, or 50 percent of his basic salary. Nor is it crucial by what formula profit shares are distributed among workers, or how welfare funds or tax paid on profit are linked to profit. All this is important, but *not primarily* important.¹⁷ In the case of a hard budget constraint the managing director would not be indifferent to profit even if his personal share were zero – since he has identified himself with the survival and expansion of the firm. What the reform literature calls “profit incentives” are included in our argument, but in the last place, as one of the tendencies counteracting softening. We do not seek merely to change the terminology, but to draw attention to the fact that the main question – both theoretically, and in practical economic policy – is not the actual form of incentive, but the rules for the survival and growth of the firm and, linked to these phenomena, the relation between firm and state.

13.10. The place of the budget constraint in micro-theory

In analyzing the budget constraint we have touched upon several questions which lead to *the foundations of standard micro-theory*.¹⁸ This postulates, as an axiom, that the economic actor has a budget constraint (by our terminology, his budget constraint is *hard*). We have used the work axiom to indicate that the theory does not regard whether the constraint exists at all and whether it affects the decision-maker as empirical questions. Let us

¹⁷This was emphatically pointed out in an article by Péter (1967) a year before the reform. In the reasoning of the article the firm's viability was placed at the center of attention. “The grounds for the existence of the firm become doubtful, if it is not profitable.”

¹⁸The pioneer of the theory on the budget constraint is the classical study by Slutsky (1915) of household behavior. Its modern versions were founded first of all by Hicks (1939a, b) and Samuelson (1945), and later it was merged with *general equilibrium theory* in the work of Arrow–Debreu (1954), Debreu (1959), and others. The book by Patinkin (1965) fitted money into the model of general equilibrium theory.

An excellent summary of general equilibrium theory is provided by Arrow–Hahn (1971). For an introductory account see Samuelson (1948a, b), Henderson–Quandt (1958), and Malinvaud (1972).

cite in this connection Clower's formulation.¹⁹ In his opinion the budget constraint is not an accounting identity, but a rational planning postulate. "...no transactor consciously plans to purchase units of any commodity without at the same time planning to finance the purchase either from profit receipts or from the sale of units of some other commodity...". It (i.e. the existence of the budget constraint) "may indeed be regarded as a fundamental convention of economic science, akin in all relevant respects to such basic ideas of physical science as the second law of thermodynamics... unless we presuppose something of the sort, we have absolutely nothing upon which to build an account of individual decision processes."

Clower is very pessimistic in feeling that if we do not accept the existence of the budget constraint as an axiomatic starting-point, there will be nothing on which to build the description of decision processes. This axiom is by no means indispensable for *every kind* of description of the functioning, control, and decision processes of socioeconomic systems. However, Clower's pessimism is quite justified if applied to a *narrow category* of scientific attempts at description. *It shakes the foundations of modern mathematical microeconomics and general equilibrium theory, if the existence of the budget constraint is not postulated.* There is virtually no such essential result in this theory – from propositions concerned with the properties of demand and supply functions to Walras's law and the determination of the characteristics of the equilibrium price system – which does not involve the assumption of a budget constraint.

In our view the existence and role of the budget constraint is *not the axiomatic starting-point* of a general theory of economic systems, but an *empirical* question. Experience may prove that in a given economy and at a given historical period certain economic actors are effectively constrained by a hard budget constraint. And it may also be proved by experience that

¹⁹In the quotation which follows Clower (1965) uses the designation "Say's principle" as a synonym for the existence of the budget constraint. We have omitted this phrase from the quotation, since we wish to avoid the historical and terminological confusion surrounding "Say's principle" and "Say's law". Here we are not considering whether the law is valid, logically or empirically. We refer only to the labyrinth that has developed around the expression. Baumol (1977) proved by detailed quotations that at least eight "laws" of different formulation and content can be read from Say's work, all of them connected in one way or another with what is generally known as Say's law. And we must mention that various interpreters even add a ninth and tenth to the series of versions of "Say's doctrine", "Say's equality", or "Say's identity".

Clower is certainly right in saying that existence of the budget constraint is closely connected with what is meant – more or less obscurely – by "Say's principle". His terminology is therefore not unfounded. Instead of a term from the history of economic thought, however, we prefer to use the clearly defined term "budget constraint".

the decisions and actions of other actors in the same or in another economy, in the same or another period are not effectively limited by the budget constraint. This last statement does not exclude the possibility that regularities can be found in the behavior of these same actors. Numerous works attempt to reveal such regularities – the present book among them. It obviously follows from our analysis that in a *socialist economy* – *exactly because of the soft (or rather soft) character of the budget constraint – Walras’s law summing up excess demands and excess supplies does not hold.* There are, however, other regularities which control economic activities.

In this chapter I do not accept or reject the existence of the budget constraint, but try to describe it: its effect may be strong or weak; in other words, it is measurable on a continuous scale. (See indicators β .) It is an important characteristic of the system how strongly or weakly the budget constraint operates in various types of decision.

Clower has been cited not only because he formulates very clearly the central role of the budget constraint axiom in standard microeconomic theory. His study is a point of departure and a classic of the above-mentioned “disequilibrium school”. It is remarkable that this new school – while having broken away of the old school in some important points – has remained strictly orthodox in some of its microeconomic foundations.

In my opinion the full theory of the macro “disequilibrium states” – either permanent unemployment, underemployment, low capacity utilization, or permanent “overheating”, the shortage economy – cannot be elaborated without returning to the *micro*-foundations of the theory. There are numerous interactions between the macro-state of the system and the micro-behavior of the actors. Macro-theory cannot be based on the assumption that there are schemes of micro-behavior *valid in all conditions*. The scheme that adequately described the capitalist textile factory working in Manchester in the mid-nineteenth century (an almost completely hard budget constraint) is no longer valid for today’s capitalist economy, (with its symptoms of softening budget constraints), and it is not at all appropriate for describing the socialist firm, even though the latter also prepares accounts of receipts and expenditures in money terms. Micro-behavior is a historical product. All its important components (demand formation, responsiveness to prices, etc.) depend on the social reality surrounding the actor: the relation of the micro-organization to the state, the extent to which it is subject to income redistribution, the influence it has on prices, the power relations between buyer and seller, and so on. And, conversely, if micro-behavior is given, it has a certain impact on the

macro-state of the system. As we saw in the example of the shortage economy, the agents' insatiable hunger for investment and tendency to hoard material (micro-behavior) represent one of the direct causes of the chronic shortages and the resource-constrained character of the economy (i.e. of the macro-state).

This book is centered primarily on problems of the socialist economy; it analyzes the relation between the macro-state and the micro-state in relation to this economy. I think, however, that a number of problems have been touched upon – including for example the question of the budget constraint – which require reconsideration in studying the capitalist system as well.

The firm: Responsiveness to price

14.1. Introduction

There are interactions between the socialist firm and prices. In one direction of cause and effect the firm is not a passive price-taker but, to a considerable extent, a price-maker. This relationship will be discussed in Chapter 15. Our present subject is the other direction of cause and effect. Suppose that prices have been determined in some way, whether influenced by the firm or not. The question arises of how the firm reacts to them.

We wish to avoid repetition. All that has been said about the behavior of the socialist firm in Part I will now only be *completed* by a discussion of the role of prices. We set out our conclusion, that prices do have an effect, but it is rather weak or *secondary*. Of the mechanisms controlling economic processes, those which have the *primary* effect are mechanisms in which prices do not play a considerable role.

In respect of responsiveness to price there is a difference in the behavior of the traditional and of the postreform firm. As will be seen, *the majority of our propositions concerned with responsiveness to price will be given as a function of the degree of hardness of the budget constraint*. Accordingly, we shall apply the results of sections 13.7–13.9. Every statement made on the assumption of a *soft* budget constraint will refer to the traditional firm. And those that hold with a somewhat harder – yet still *rather soft* – budget constraint can be considered as valid for the firm operating within the framework of post-reform economic management. In order to simplify discussion, this will not be repeated as a refrain: it is left to the reader to relate relationships given as a function of the degree of hardness of the budget constraint to prereform and postreform states. Beyond this, in a few places in the book we shall describe separately the behavior of the traditional and of the postreform socialist firm.

Table 14.1
A summary of types of the firm's responsiveness to price in different contexts.

	1	2	3	4
	Instantaneous and short-term adjustment		Long-term adjustment	
	On the input side	On the output side	On the input side	On the output side
1. Decisions concerning total volume	Determination of the overall level of initial demand Section 14.2	Determination of the overall level of output Section 14.6		Determination of planned capacity Section 14.8
2. Decision concerning product composition	2A. Determination of composition of initial demand Sections 14.3 and 14.5 2B. Revision of initial demand before forced substitutions Sections 14.4 and 14.5 2C. Instantaneous and short-term determination of the composition of inputs Sections 14.4 and 14.5	Instantaneous and short-term determination of the composition of output Section 14.6	Choice of technology Section 14.9	Determination of the composition of output Section 14.8

Since this set of problems is rather complex, it will be useful to go through the discussion in advance. This is done in table 14.1.

Rows 1 and 2 of the table distinguish two classes of decisions concerning *quantity* and *composition*. In terms of demand this distinction is parallel with the well-known distinction in standard microeconomics between the *income effect* and the *substitution effect*¹ of a change in price. It is our aim to examine these effects, or the lack of them, under the conditions of a shortage economy.

Not all problems included in the table will be treated in the same detail. The case defined by the entry [column 1, row 2] will be treated at greatest length. This is the effect of relative prices on the firm's instantaneous and short-term demand and the actual input combination. It is not only the importance of the subject that justifies discussion in full detail, but also the fact that *analytical tools* will be developed which will also be used to examine other aspects.

We shall generally disregard special issues related to the effects of export and import prices; they will be treated only briefly with regard to investment.

14.2. The income effect

Let us begin with the phenomenon that is called *the income effect* in standard consumption theory. How does the change in price affect the *quantity* demanded by the firm within the framework of instantaneous and short-term adjustment? At this point we fully disregard substitution, which will be treated a little later. Let us therefore consider the problem in extreme form. What happens if it is not the price of a single input that changes but that of a whole group of inputs which are all substitutes? (For example all kinds of raw material that can be used in the manufacture of a product.) Their prices increase simultaneously in the same proportion, while the prices of complementary inputs are unchanged.

According to standard microeconomics, demand for the group of inputs that has become more expensive ought to decrease, since the same budget can now purchase only a smaller quantity. This is true, however, only with a hard budget constraint. *In the case of a soft budget constraint the income effect does not materialize.* If the firm has a demand for any input which is on sale, it will buy that input in spite of the higher price. Where the

¹See Hicks (1939a, b) or, for a survey, Green (1976).

increased costs cannot be covered within the limits of its budget constraint, it will sooner or later charge them to the buyer or the state.

Let us examine carefully not only the two polar cases but also all intermediate cases between hardness and softness. The relationship shown in fig. 14.1 is of course highly simplified. We consider – as a function of the input price p – the instantaneous increase in initial demand d from firms buying a single input. We shall carry out a comparative static analysis.

From the set of indicators showing the degree of hardness of the budget constraint (i.e. from vector β) we shall pick out a representative component which will be illustrated in the figure. It has two extreme values. One is $\beta_{\text{hard}}^* = 0$ where the constraint is perfectly hard. The other one is $\beta_{\text{soft}}^* > 0$ where softness of the constraint has reached the critical value. If the softness of the constraint exceeds the critical value, the constraint does not restrict the actions of the firm at all.

Let us start from the case of the traditional socialist firm whose demand was discussed in detail in Chapter 5. There it was explained that although strong tendencies drive demand toward infinity, instantaneous demand is finite. We assume that instantaneous demand is given, and denote it by \bar{d} .

The horizontal straight line in the upper part of fig. 14.1 is the demand curve for the case β_{soft}^* . It is perfectly price-inelastic, although it changes, of course, as a function of *other* explanatory variables.

The demand curve associated with the degree of hardness β_{hard}^* slopes downwards, as is well known from micro-theory. Here we shall exclude all kinds of substitution possibilities, and therefore may disregard also the special case of inferior goods. Under these assumptions postulating a hard

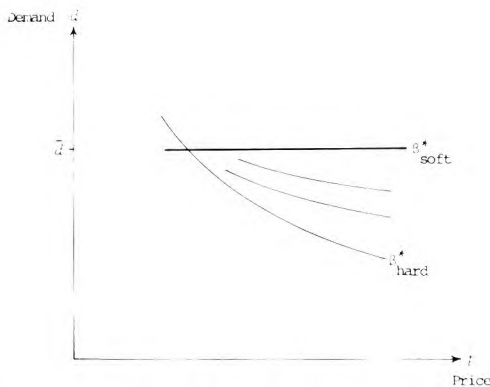


Figure 14.1. Shifts of the firm's demand function as the softness of the budget constraint changes.

budget constraint is sufficient, because of the income effect, for this downward slope to appear. The *same* amount of money will buy less if prices rise – this trivial relationship guarantees the result. It is assumed that there is a price at which the demand level incorporating the price effect is equal to demand \bar{d} formed independently of any price effect. This is the point of intersection between the two curves. If the price is higher than that, the demand remains below \bar{d} .

Between the two limiting curves there is a host of other curves. *The shape of the demand function is shifted as the budget constraint is softened (i.e. as the value of β increases), from the customary downward sloping shape to the horizontal price-inelastic shape.*

We can present our observation more exactly if we take into consideration the *reaction time* to a change in prices. Instantaneous reaction to the rise in price may be larger, even with a relatively soft budget constraint, not only because of the “first shock” caused by the higher price, but also because it takes time to charge the increased costs to somebody. Thus, the horizontal upper straight line of fig. 14.1 and the curves lying near to it describe not instantaneous but short-term adjustment.²

This is consistent with what we said about the demand function of the firm in Chapter 5. If the budget constraint is soft, a purely “quantity” adjustment takes place and the demand functions (5.1)–(5.4) need not include the prices of inputs as explanatory variables. If, however, the budget constraint hardens somewhat, the price of inputs will be included among the explanatory variables in the firm’s input demand function. The income effect of the rise in input price also contributes to the tendencies described in Chapter 5 that exert a countereffect to the forces driving demand toward infinity.

14.3. The substitution effect: Instantaneous initial demand

Much more complicated than the income effect is the substitution effect or the impact of relative prices on the choice among alternative inputs. We begin by examining *instantaneous initial demand* for inputs and we discuss later the revision of demand, actual purchase, and short-term adjustment.

We shall use a simple model to represent our argument. A choice must be made between two inputs which are direct substitutes – though not

²In the distinction between instantaneous and short-term reactions counteracting tendencies also operate. Habit and rigidity weaken first reactions. *Real* adjustment usually takes time. This interrelation would be give more prominence only if substitution were permitted, but at this point in the analysis we disregard it.

equivalent technologically – A and B. (In our earlier example of the screw factory these were steel of qualities 10 and 11.) In period zero their prices were p_0^A and p_0^B , respectively. Now, at the beginning of period 1, A became relatively cheaper: $p_1^A/p_1^B < p_0^A/p_0^B$.

Let us assume that the total volume of products A and B traded within this market and the volume of production of firms manufacturing A and B do not change over time. Thus we are dealing with a stationary trade and production process, and what we observe is only the internal composition of trade or the changing proportions between A and B.

The instantaneous initial demand of all buyers (the screw factory, machine factories, etc.) for inputs A and B at the beginning of the t th period is denoted by $d_t = [d_t^A, d_t^B]$.

We distinguish between two pure types of initial demand formation.

*Demand responsive to price.*³ The buyer's initial demand is determined in accordance with standard demand theory. This is shown in fig. 14.2 which illustrates the *isoquant* that represents the substitution possibilities between inputs A and B for all buyers. This is the *engineering* side of substitution; it shows to what extent input A is able to replace input B. In our figure the transformation curve is convex. In reality it is not always so; since, however, textbooks usually assume convexity – and since the shape of the curve does not affect our reasoning – it is convenient if we, too, draw a convex curve. Thus, it will be easier to show where the relationship we describe is the same as the neoclassical model, and where it differs from it.

The budget constraint is represented by the *budget line*. As usual we assume that an amount M of money is given, to be spent by all firms on A and B. As a consequence of a relative price change the straight line is shifted: for the same amount m the customers can buy more A and less B in period 1 than they could in period zero.

The initial demand of all buyers is at the point most advantageous for the firms, the point of tangency between the isoquant and the budget line. As a consequence of the change in price ratios this shifted from point $d_0[\text{price}]$ to point $d_1[\text{price}]$.⁴

³The Hungarian text uses – in literal translation – the term “price-sensitivity”, since there is no exact Hungarian equivalent of the notion “responsiveness”. The term “responsiveness” is better in this context, since we mean not only the firm's perception of price, but its reaction to it as well. [*Translator's note.*]

⁴In Mathematical Appendix A, λ , the *voluntary substitution propensity* of buyers, denotes the proportions in which buyers would choose product G voluntarily, on the basis of relative prices, in preference to substitute product H. The relationship between variables there and those used in the present model is the following:

$$\lambda(P) = d^G(p^G, p^H) / (d^G(p^G, p^H) + d^H(p^G, p^H)). \quad (14.1)$$

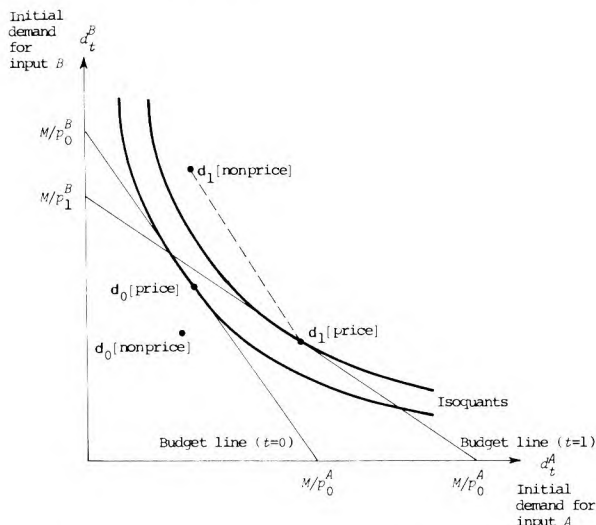


Figure 14.2. Formation of instantaneous initial demand.

This model is based on a number of assumptions which we shall not describe here in detail. We shall indicate two of them, however, since they play a special role in our later argument.

(1) The budget constraint is hard. Therefore the point $d_1[\text{price}]$ cannot be chosen above the budget line. Buyers cannot increase their demand for a product to such an extent that they cannot pay for it.

(2) Firms maximize profit. Therefore initial demand $d_1[\text{price}]$ cannot be at an interior point of the area marked off by the budget line. It is worth moving to the boundary, to the point of tangency between the isoquant and the budget line.

Let us now go on to discuss the other pure type of instantaneous demand.

Demand unresponsive to price. The pure case which entirely disregards the price effect could be interpreted in a general sense, valid for any system. Yet we shall interpret it now in the narrower context of a resource-constrained socialist economy.

In Chapters 4 and 5 we explained that although the initial demand of the firm is driven strongly towards infinity, it still remains finite because of counteracting tendencies. In fig. 14.2 we consider it given and denote it by points $d_0[\text{nonprice}]$ and $d_1[\text{nonprice}]$, respectively.

It is assumed only for the sake of sharpening the contrast that when demand is not responsive to price it moves in the opposite direction than in

the price-responsive case, so that the demand for input B increases, while that for input A falls.

Although we discussed them in more detail in Part I, and particularly in Chapters 4 and 5, we now remind the reader of a few factors which may cause such a shift in initial demand.

(1) The superior authority expects the firms to make such a change. This expectation may be expressed in the form of an instruction, or only as an emphatic request; in either case, it may compel the firm to alter its earlier demand.

(2) The seller of inputs A and B (the metallurgy works in our example) prefers to sell B since it has a large unsold stock. A buyer in a shortage economy seeking to obtain the goodwill of the seller tries to make allowance for this preference.

(3) Buyers of goods produced from inputs A and B would like to get more of the product made from B and less of the product made from A. They ask and encourage their suppliers to fulfill their wish, and the latter forward this wish to the suppliers of the inputs.

(4) Users will need both A and B in the future. However, supplies of input B seem more uncertain, and must therefore be hoarded.

The list is far from complete. Any factor that influences choice between A and B, except prices p_A and p_B and the *engineering* substitution possibilities expressed in the isoquant, should be included.

Figure 14.2 leaves open how the initial demand d_i [nonprice] depends on the explanatory variables listed above and on others not mentioned. It only assumes that explanatory variables of a nonprice character determine the demand d_i [nonprice].

In drawing the figure we assumed that d_i [nonprice] was chosen by a firm with a *soft* budget constraint, and by a firm whose objectives could not be described as “profit maximization”. Therefore, points d_i [nonprice] may be either above or below the budget line.

Actual initial demand is formed as the joint result of two kinds of effect, price and nonprice. This is described by formula (14.2):

$$d_i = \vartheta^{i-\text{dem}}(\beta) d_i[\text{nonprice}] + (1 - \vartheta^{i-\text{dem}}(\beta)) d_i[\text{price}].$$

actual
initial
demand

damper
factor

degree
of
hard-
ness
of the
budget
con-
straint

initial
demand not
responsive to
price

initial
demand
responsive
to price

(14.2)

According to (14.2) actual demand is a weighted average of demand in the price-responsive case and the case when demand is not responsive to price. $\vartheta^{i\text{-dem}}$ is a weight⁵ the economic interpretation of which is the following: it is the relative weight of nonprice effects which dampen the impact of prices. That is why it is called the *dampener effect*. It is a function of the hardness of the budget constraint.

As we said in the previous chapter, for a perfectly hard budget constraint $\beta = 0$. All its components increase as a function of softening of the budget constraint. Let $\hat{\beta}$ be the critical value at which the budget constraint is perfectly soft, where it does not bind the decision-maker's choice at all.

We stipulate that $\vartheta^{i\text{-dem}}(\beta) = 0$, if $\beta = 0$. That is to say, in the case of a perfectly hard constraint actual demand is the pure price-responsive demand. We further stipulate that $\vartheta^{i\text{-dem}}(\beta) = 1$, if $\beta = \hat{\beta}$. In other words, if the budget constraint is perfectly soft, actual demand is at a level found in the case when demand is wholly unresponsive to price. And in intermediate states $0 < \vartheta^{i\text{-dem}}(\beta) < 1$, the actual initial demand being a convex combination of the two pure cases. Therefore, d_i in fig. 14.2 is found on the dotted straight line connecting $d_i[\text{price}]$ and $d_i[\text{nonprice}]$.

The formulation of (14.2) is based on several arbitrary assumptions, such as the "normalization" of the dampener factor $\vartheta^{i\text{-dem}}$ to the domain $[0, 1]$, or the assumption that actual demand is a *convex* combination of the two pure cases. But this only serves the expository purpose of presenting what we have to say in the simplest and most illustrative form possible.

What are not arbitrary however, but, at least in the author's conviction the reflection of genuine relationships, are the two main ideas expressed in formula (14.2).

In the formation of actual initial demand both price and nonprice factors have a part.

The relative strength of these two different kinds of effect depends, not exclusively, but mainly, on the degree of hardness of the budget constraint.

The Walrasian solution of the problem becomes a special case of the general choice problem. In our simple formal model⁶ the system is Walrasian if the budget constraint is perfectly hard ($\beta = 0$), and the effect of a price signal on initial demand is not dampened at all, so that $\vartheta^{i\text{-dem}}(\beta) = 0$.

⁵The index "i-dem" beside the symbol is an abbreviation for "initial demand". Dampener factors affecting the revision of demand and supply will be discussed below.

⁶Indicators for the degree of shortage, and some of the parameters for the system's control mechanisms have been uniformly defined in the book so that value zero represents the Walrasian state or the Walrasian system. This convention is now used again in specifying the function ϑ .

In the argument above the damper factor is related to a single recurring problem of choice (input A or input B) in a single partial market. If we wish to characterize the initial determination of demand for all inputs in the whole firm sector, we should do it with a vector $\mathfrak{D}^{i\text{-dem}}$ the components of which are the partial indicators $\mathfrak{D}^{i\text{-dem}}$.

Indicators $\mathfrak{D}^{i\text{-dem}}$ describe one of the characteristic aspects of buyer's behavior. They are important components of what we called in Chapter 4 the *buyer's attitude* which is made up of the constant elements in the buyer's behavior.

14.4. The substitution effect: Forced substitution and short-term adjustment

Determining initial demand is only the first step. It is followed by the buying process which ends with actual purchase and actual production. How are all these events affected by the price signal?

Let us begin by a mental experiment: each phase takes place within the framework of *perfect Walrasian adjustment*. We stick to the example of the previous section: input A becomes cheaper relative to B. Since the effect of the price signal is not dampened by anything ($\mathfrak{D}^{i\text{-dem}} = \mathbf{0}$), the initial demand in fig. 14.2 shifts from point $d_0[\text{price}]$ to point $d_1[\text{price}]$. And the next step is for buyers to enter the market. If the market is Walrasian there is no shortage. Initial demand can be satisfied immediately and without difficulty.

The firm adjusts not only as a buyer but also as a producer. Let us recall the concepts and notation introduced in Chapter 8: there is no delay ($\tau = 0$), no rigidity ($\xi = 0$), and in general no friction ($\mathbf{w}^* = \mathbf{0}$). The hard budget constraint forces the firm to carry out a shift from the relatively dearer to the relatively cheaper input. Adjustment of inputs to a price signal takes place immediately and perfectly.

Real economic systems are, however, non-Walrasian in nature: adjustment is not perfect. We could analyze this using various systems as an example, yet we shall center our attention on the resource-constrained socialist economy. We illustrate the interlinking of the phases of adjustment in fig. 14.3. Fields with a heavy line represent certain *behavioral features* of firms, those with rounded corners represent *decisions* and *actions* of the firms, and boxes with a thin line represent the signals received by the firm as buyer *from the outside*, and supplies available externally.

It is not necessary to discuss again the relationships between *Fields A, B, C, D, and E*, since this was done in the previous section. We know that the

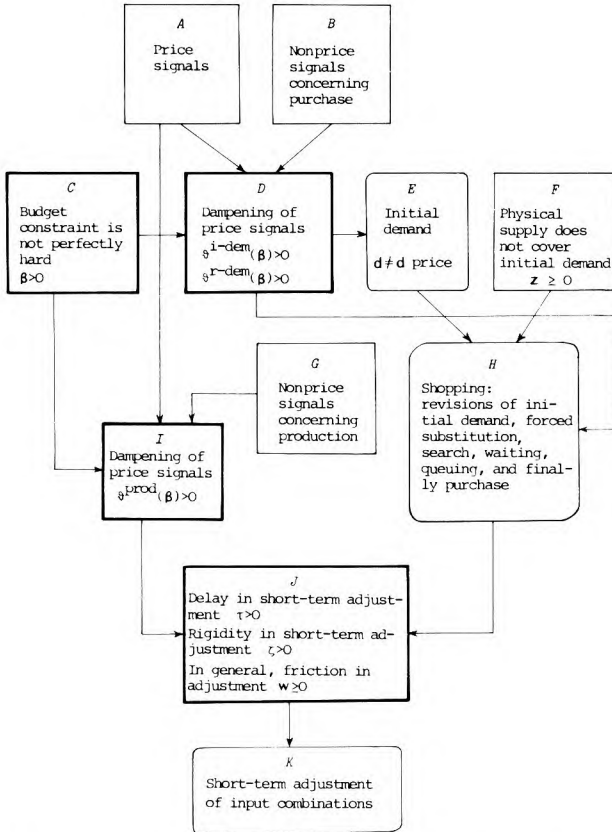


Figure 14.3. Effect of price and nonprice signals on the short-term adjustment of input combinations.

instantaneous initial demand of buyers does not correspond to the initial demand $d[\text{price}]$ that would have materialized if the price signal operated without a countereffect. Hence, buyers set out to purchase a quantity $d \neq d[\text{price}]$. They find themselves faced with a certain physical supply (Field F). We are in a chronic shortage economy ($z > 0$), therefore it is to be expected that initial demand cannot be fully satisfied. *Therefore not only may nonprice signals dampen the effect of the price signal, but shortage may also impede its operation.* The greater the shortage the more difficult it will be for the price signal to get through.

The *shopping process* gets started. (Field H its events were described in Chapter 4.) Let us assume that one of the buyers (e.g. the purchasing agent

of the screw factory) could not get input A, which he intended to buy. However, input B is available as a forced substitute, and in two versions, B-1 and B-2. In making his choice between them, the buyer considers the relative prices of B-1 and B-2.⁷ As before, in forming *initial* demand, so now in forming demand *revised* by forced substitution the effect of the price signal does not operate purely. It can again be dampened by nonprice signals and impulses. This is represented by the symbol ϑ^{r-dem} to be seen in *Field D* in the figure.⁸ (The index “r-dem” refers to “revised demand”.) The relative prices affect the choice between inputs B-1 and B-2 to an extent which depends on the magnitude of the damper factor; for the sake of brevity we do not present a relationship analogous to formula (14.2).

After repeated revisions of demand and perhaps after a long search, delays and queues the purchase is effected.

What happens *in production* in the meantime? As it was before the purchase, the price signal is again complemented by nonprice signals and impulses. (The former come from *Field A*, and the latter from *Field G*.)

These include instructions of superior authorities concerning inputs, material allocations, and other input quotas, and so on. The outcome of the two different groups of effects depends on how important it is for the firm to follow the price signal. The softer the budget constraint, the more the principle that “cost does not matter” spreads among production managers. This is expressed by the damper factor $\vartheta^{prod}(\beta)$ which weakens the effect of the price signal and strengthens the effect of nonprice signals. (The combined result of the two different effects would be produced by a relationship analogous to formula (14.2); we shall not go into the details.)

In addition, production managers are influenced by the experience they gained in making the purchase. (This is represented by the arrow starting from *Field H*.) It is worth considering abandoning use of an input which is continually in short supply, even if it is comparatively cheaper than the substitute which is available more easily and reliably. The firm’s stocks of inputs and backlogs of unfilled orders are a joint result of the buying and producing processes. Their levels serve, in the framework of the vegetative control discussed in Chapter 7, as further signals.

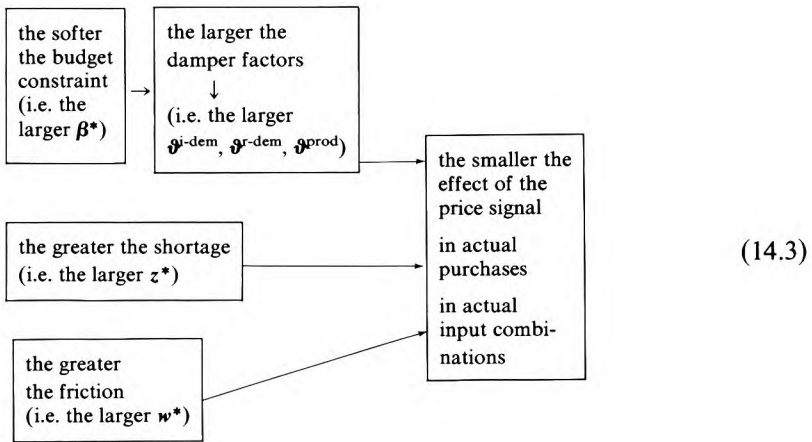
All these effects together form the opinions and aspirations of production managers with respect to input combinations. However, this is still not

⁷In the model of Mathematical Appendix A this is expressed in accordance with the assumption that the propensity to make forced substitutions is a function of relative prices. We disregard there the influence of other, nonprice factors.

⁸Indicators ϑ^{i-dem} , like indicators ϑ^{r-dem} , are elements in the *buyer's attitude* which express the permanent features in the buyer's behavior.

the reality of production. We refer the reader to Chapter 8 where we explained that adjustment is impeded by *friction*, expressed by a vector of friction indicators $w > 0$, particularly by two friction phenomena, *delay* ($\tau > 0$) and *rigidity* ($\xi > 0$) of *adjustment*.⁹ The effect of friction appears in *field J*. Even this obstacle must be overcome in order to get to the last stage, *field K*, representing actual short-term adjustment of the input combination.

Figure 14.3 is, unfortunately, a complicated one consisting of eleven fields. Although it would be much more attractive to present to the reader a simpler and clearer scheme, I have found it necessary to present the process in all its complexity. In order to facilitate understanding, however, we shall emphasize separately, the main direction of the causal relationships. The starting point is the price signal appearing in the *control* sphere (*Field A*), and the terminal points are events taking place in the *real* sphere, *actual purchases* (the final result of *Field H*) and the *actual input combination* (*Field K*). Which *causes* explain the strength of the reaction between the starting-point and the end-point? The answer is summed up in formula (14.3):¹⁰



⁹Again the reader is referred to the chapters of Part I, where we described in detail quantity adjustment, disregarding price effects. Now we seek to understand the operation and interconnection of quantity adjustments and price adjustments.

¹⁰We content ourselves here with a verbal formulation of the relationship between dependent and independent variables. For a mathematical formalization we need to know more about the relationship.

The demand relationships described in Chapter 5, and formulae (14.2) and (14.3) are both to be considered as drafts of an exact theory of a firm's demand function valid in the resource-constrained system.

Now we can clearly formulate the meaning of the title of this chapter, *the firm's responsiveness to price*. At this point we refer only to instantaneous and short-term adjustments in input combination, but the interpretation can obviously be generalized either to outputs or for both inputs and outputs for all degrees of adjustment. *Responsiveness is the closeness of the linkage between price signals and reaction of the firm*. Responsiveness depends partly on the behavioral characteristics of the firm, and partly on technology and on the state of the market.

With given institutions, control mechanisms, and signal systems a *normal price-responsiveness* of firms develops. This is a stochastic phenomenon. With different firms at the same time, or with the same firm at different times, reactions may be different. In speaking of *normal price-responsiveness* we have in mind the *interfirm and intertemporal* average of the behavior of firms displayed over a particular historical period.

Responsiveness to prices is a *vector*; it can be described only by several indicators together. This leads us to the issue of observation and measurement, which we shall discuss in the next section.

14.5. Hypotheses and the possibilities of empirical testing

The analysis of sections 14.2–14.4 and consideration of the nature of the causal relationships suggest the following hypotheses.

(1) *The normal price-responsiveness of the traditional socialist firm on the input side is slight for instantaneous and short-term adjustment. The influence of relative prices is almost totally dampened by weakness of economic forces, by the possibility of shifting the burden of rising costs (i.e. softness of the budget constraint), by the high intensity of shortage, and by frictions in adjustment.*

(2) *Following the reform of economic management the price-responsiveness of the socialist firm increased somewhat on the input side in terms of instantaneous and short-term adjustment, but the increase is slight. The impact of prices is still largely dampened by the fact that the budget constraint is rather soft, and because shortages and friction are considerable.*

These hypotheses are supported not only by logical analysis but also by casual empiricism. Their validity needs thorough empirical testing. Three main methods can be considered.

(i) *Statistical investigation* of the interrelations between changes in relative prices on one hand and actual purchases or actual input combination on the other. This can be done using time-series or cross-section data. It is

worth trying, even though serious difficulties may be expected. Separating the effect of change in price from the influence of other factors is a difficult problem. Let us assume that input B became relatively more expensive than input A, and that subsequently purchases and use of A increased. What is the cause; or at least, what is the major cause of this? Is it the change in relative prices? Or is it perhaps that B is *not available* at all? Is it the case that, as relative prices changed, administrative restrictions were put on the use of B? Statistical examination cannot be applied in a mechanical way, but it must be accompanied by thorough causal analysis.

(ii) *Case studies*. Here detailed examination is made of all the effects of some actual price change, using data and asking questions of those affected. What took place in purchase departments and workshops as a result of the change in price? If no adjustment to price changes took place and this led to increases in costs, how large were the extra costs imposed on buyers or on the state?¹¹

(iii) *Interviews* can be held to reveal the attitude of firms' managers. Questions regarding hypothetical situations may be asked: how would they react to price changes of various types and sizes? Check questions may add to the reliability of answers.

Although none of the methods promises fully to clarify the problem, they may still bring us closer to a recognition of price-responsiveness of firms in practice. Unfortunately, for the time being we have very little basis for deciding the question. Hundreds of books and thousands of articles discuss what the relative prices of inputs *should be*. Meanwhile not one study gives a reliable answer to the question *whether changes in the relative prices of inputs have any effect at all on the real actions of firms*. We shall maintain the assumptions formulated in hypotheses (1) and (2) above until they are empirically refuted.

14.6. Instantaneous and short-term adjustment of output

Having dealt with the input side of instantaneous and short-term adjustment, we shall turn our attention to the *output* side. Let us take first the *total volume* of output. For a moment we consider the firm's composition of output and the relative prices of its products as given. We denote the

¹¹This is exactly what frequently happened in Hungary as a consequence of price explosion on world markets. The effects of drastic changes in import prices were dampened by temporary and permanent compensatory grants to firms—customs and tax allowances, subsidies, etc.

aggregate volume of output by x . The maximum *capacity* of the firm is denoted by \hat{x} .

In fig. 14.4 we recall the well-known propositions of standard microeconomic theory about the behavior of the profit-maximizing firm.¹² Two basic types are usually distinguished in this context. One is the price-taking firm operating in perfect competition. For this firm the selling price p is exogenous. (Since, by assumption, product composition is fixed, p is the price of the composite product.) The profit-maximizing output level, x^{perf} , is at the point where price equals marginal cost, $p = c'(x)$. Its size depends on p and on the shape of the curve $c'(x)$ but it is generally assumed to be less than full capacity utilization: $x^{\text{perf}} < \hat{x}$.

The output level of the firm under perfect competition is controlled by price. Increased price would cover higher marginal costs and thereby would lead, other things being equal, to increases in output.

The other basic model in standard microeconomic theory is of the firm operating under imperfect competition, for example a price-maker oligopolist. The price it asks depends on the demand function of its customers. This is indicated in our figure by the decreasing marginal revenue function $r'(x)$. The profit-maximizing output level, x^{imperf} , is at the point where marginal revenue equals marginal cost: $r'(x) = c'(x)$. It depends on the shape of curves r' and c' . It can be proved, however, that under certain conditions it is smaller than the profit-maximizing level with perfect competition and exogenous price: $x^{\text{imperf}} < x^{\text{perf}} < \hat{x}$.

In a sense *the output volume of the oligopolist described above is also controlled by price*. If buyers were prepared to pay a higher price for a given quantity (in other words if the marginal revenue curve shifted upwards), the output level x^{imperf} would also increase.

The behavior of *the traditional socialist firm* is radically different from the behavior of firms in the models above. *Its output level is not controlled by price*. Powerful forces which are independent of prices drive the firm toward full capacity utilization. As explained in detail in Chapter 12 full capacity is not the maximum production attainable by the firm in ideal conditions, but the maximum attainable given the normal frictions of the system. Capacity is not a single, uniquely defined number, but rather a "zone". At every moment the firm hits certain bottlenecks on the input side; these resource constraints limit capacity. The traditional socialist firm is driven to taut capacity utilization by the output plan, by the quantity

¹²See the microeconomic literature mentioned in footnote 18 of Chapter 13. The model can be interpreted as a description of instantaneous or short-term adjustment.

The marginal cost curve is U-shaped in the standard model of the firm. (See sections 12.1 and 12.5.) Fig. 12.4 also shows a U-shaped curve.

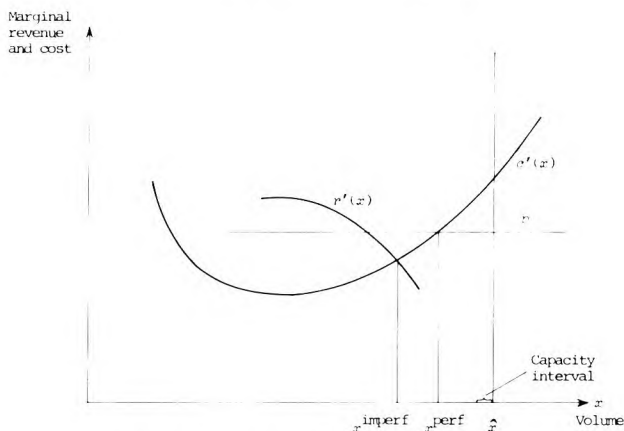


Figure 14.4. Output levels of various types of firms.

drive, and by the pressure of buyers queuing up for the product. (See Chapters 2, 4, and 6.)

It may happen that price does not cover the marginal costs in the zone near full capacity utilization. This does not stop the firm from increasing output. The budget constraint is soft. If the firm incurs loss through increasing its output, it can expect the state, or perhaps the credit system, to cover the loss in some way by giving price support, subsidies or special credits. Alternatively a price increase takes place sooner or later. *It is not volume that is adjusted to price, but much more frequently price which is adjusted to the high costs caused by high output.*

The standard microeconomic rules ($p = c'$, or $r' = c'$), in practice never limit increases in total output. If it is restrained at all, it is by bottlenecks on the input side.

It seems that in this respect (the control of total output) the role of price has not increased even *after the reform*. The firm is still not interested in any kind of restriction, and moreover the specific form of profit incentive encourages it to increase the volume of production. The budget constraint is still rather soft; higher marginal costs may be compensated by higher selling prices or higher government subsidy.

The reform brought more change in the instantaneous and short-term effects of prices on the *composition* of output.¹³ However, let us first take

¹³The formalizations and methodology introduced in sections 14.3–14.6 to describe the interrelations between substitution, choice of inputs and relative input prices and the firm's price-responsiveness on the input side, can be applied in an analogous manner to the output side. We do not elaborate the parallel here.

the case of the *traditional* socialist firm. Output composition is to a large extent determined by the firm's efforts to fulfill the plan. Either, the central plan regulates the detailed composition from the outset or, even if a partial choice is left to the firm it considers first of all what composition of output will fulfill (or overfulfill) the aggregate production plan in the easiest way. This latter consideration gives rise to a *special kind of price-responsiveness* of the composition of output. If products C and D use identical physical inputs, the firm will prefer to manufacture C if its selling price is higher than that of D. It acts in this way because manufacturing product C from given physical resources enables the firm to produce more output in aggregate, measured in value terms. The firm will prefer to manufacture C even if customers want to buy D as well. This special price-responsiveness may – sticking to our example – make the shortage of D more intense, while unproductive stocks of C accumulate.

The reform has brought considerable change in this respect. For example, in Hungary the firm does not get a detailed central plan for the volume and composition of output. This allows *the firm to give preference in manufacturing to those products which are the most profitable*. The firm is *somewhat responsive* to price in the instantaneous and short-term adjustments of its output composition.¹⁴

The attribute “somewhat” is to indicate that this price-responsiveness is not very strong since, as we have seen, profitability is not a question of life and death for the firm. If, it does not in the end succeed in finding an output composition advantageous from the profitability point of view, it can still live safely and expand. Yet a higher profit has certain advantages, as explained in section 13.9. Therefore if a firm has to choose between products it will choose the more profitable one.

14.7. Asymmetry: Responsiveness to price on the input and output side

The responsiveness to output prices of a socialist firm operating in a resource-constrained system is very different from that of a capitalist firm operating in a demand-constrained situation. The firm bound by a demand constraint is forced to take the demand of its customers as determining the composition of output. It may be happy to manufacture a good which

¹⁴The supply function of the socialist firm was outlined in formula (6.1). In addition to the main explanatory variables examined there in more detail, a reference is also made to “other effects” which influence the supply of the firm. Relative prices of outputs should be included here as an explanatory variable for supply because they influence the firm's supply according to the preferences described above.

yields a relatively small profit as long as its inclusion in the production program yields a positive marginal profit. That is because producing such goods allows the firm to enlarge its sales and reach output level x^{perf} or x^{imperf} . On the other hand, in a suction economy, where chronic shortage prevails, the seller is not forced to do this, since he can sell his products anyway. Therefore, he can choose what to produce on the basis of profitability more than the demand-constrained capitalist firm can. If of two substitute products G and H the first is more profitable, the producer firm will give it preference, even if the customer would prefer H. (Relative prices, as we shall see in a subsequent chapter, do not always reflect the preferences of customers.) The producer rightly expects that, since there is shortage, the buyer will finally accept G, if only as a forced substitute for H.

In the situation described above, the socialist firm chooses what to produce more on the basis of profitability than the capitalist firm not because it is greedier than the latter, “more capitalist than the capitalist”, but because it operates in a shortage economy and does not experience selling difficulties.

As a customer the firm gives in to the seller who decides what to produce according to relative prices. The customer does not even resist price increases because of its dependence. And the soft budget constraint enables the customer to charge the increased costs to its own customers or to the state.

There is a remarkable asymmetry between the input and the output side. While the firm as customer does not select inputs on the basis of their relative prices, on the output side its choice is strongly based on relative prices. This asymmetry follows logically from the nature of the resource-constrained shortage economy. In a seller’s market the seller dictates and the buyer must conform. In fixing the composition of its output, a firm in the shortage economy can relatively easily be guided by the profit incentive, while it can hardly be so guided in fixing the composition of its inputs.

We already noted in Chapters 5 and 6 that the *attitude* of buyer and seller is asymmetrical. In the suction case it is the customer who makes the effort to win over the other party – in the pressure case it is the seller. Here we must incorporate the price-responsiveness of the buyer and the seller as one of the elements of this attitude on both the input and the output side.

Table 14.2 compares the two different situations and the two different attitudes. It is concerned exclusively with trade between firms. The left-hand side shows a market characterized by suction. The firm is resource-constrained. Although it is interested in increasing profits, its budget constraint is soft. The right-hand side shows a market characterized by

Table 14.2
Asymmetry in the behavior of market actors.

Market state	Sellers' market: suction	Buyers' market: pressure
Effectiveness of constraints	Resource-constrained production; soft budget constraint	Demand-constrained production; hard budget constraint
Are stocks held chiefly as inputs or as outputs?	Inputs	Outputs
Who makes greater efforts at winning the other party?	The buyer	The seller
In terms of instantaneous and short-term adjustment, on which side is the firm more responsive to price?	Outputs	Inputs

pressure. The firm is demand-constrained. Not only is it interested in increasing profit but also, its budget constraint is hard. The table recalls also the phenomenon discussed in Chapter 6, the levels of stocks of inputs and outputs in the resource-constrained and in the demand-constrained systems, because this partly explains the price-responsiveness of the system.

We add one more remark to our comparison of resource-constrained and demand-constrained systems. On the inspiration of Keynes, and following Hicks,¹⁵ two control mechanisms have been contrasted: "fix-price and flex-price". In the fix-price case "quantity" adjustments take place; quantities supplied and demanded are adjusted to the given price and to one another. In contrast, in the case of flexible prices, changes in price bridge the gap between supply and demand; prices are adjusted to quantities. The fix-price assumption constitutes one of the foundations of Keynesian macroeconomics, and the flex-price assumption constitutes one of the foundations of Walrasian microeconomics.

The distinction is applicable only to demand-constrained economics consisting of firms with hard budget constraints, that is, to a pressure economy. Therefore, it can be used in the analysis of modern capitalism. On the other hand, in a socialist economy, although it does matter, whether prices are fixed or flexible, the distinction is of secondary impor-

¹⁵See Hicks (1965) and Leijonhufvud (1968).

tance. Among firms “quantity” adjustment is dominant not because prices are fixed or rigid, but because the effect of prices is slight. That is why we called Part I of this book not “‘Quantity’ adjustment at fixed prices”, but “...without prices”. And the title of Part II is not “Adjustment through price flexibility” but “...in the presence of prices”: indicating that, although price changes have an effect, it is not a strong one.

14.8. The effect of price on investment decisions: Outputs

After examination of the role of prices in instantaneous and short-term adjustment in sections 14.2–14.7 we go on to discuss *long-term* adjustment. This time the order of discussion will be reversed. In the present section we begin with the output side, and the next section covers the input side.

Many different aspects of the question have already been treated, mainly in Chapters 9, 10, and 13, yet for the sake of completeness some of our earlier remarks will be repeated here, if only briefly.

Sections 14.8 and 14.9 will first deal with the case of the *traditional* system of economic management, and the postreform situation will only be briefly referred to at the end of each section.

By the *investment output decision* we mean a decision as to where fixed capital investment should take place and how much new capacity should be created. The decision may also include the composition, at least in aggregate terms, of the output to be produced with the new capacity.

As was pointed out in Chapter 9, there are always many more investment proposals than can be accepted by the chief economic authorities or the planners. What *selection criteria* do they use in making their investment decisions? In answering the question we do not strive for completeness, since to do so would go beyond the scope not only of the chapter but of the book too.

First of all it must be emphasized that the selection *cannot be covered by any single rule; no unique criterion can be set out upon which acceptance or refusal would be based*. In this negative statement stress is laid on the word “unique”: the decision taker weighs up *multiple criteria* and compares them in a “qualitative” way, establishing in the end a kind of compromise between them.

It is well known from socialist planning manuals that an important role in selection is played by study of the so-called *balance relationships* of the national economy. This means systematic mutual adjustment of future outputs and inputs. From the product balances of medium- and long-term

plans fairly unambiguous conclusions can be drawn concerning the investment decisions which must be taken and the new capacity which must be created to produce nontradable goods and services. (If, however, expansion of home production is in competition with increasing imports or if the output may also go for export, the decision is closely linked with foreign trade problems. But these are outside the scope of this book.)

Although investment plans have a long time-horizon, investment choice is nonetheless influenced by the current situation. It has already been mentioned that the initiator of an investment project is encouraged by the knowledge that there is shortage of the product. This is not only an unspoken motive, but also an argument which is made openly and usually convinces the allocator of investments. It improves the chances of approval if the claimant can prove that there is serious shortage of his product or service. Although everybody knows that allocations ought to be based first of all on information about the *future*, it is hard to break away from complaints just heard or from the emotional effect of the *immediate* signal.

The selection criteria just described are based upon *nonprice* signals. The signals partly comprise numbers and data and partly the "tone of voice" or even "loudness" of those participating in the allocation process. Although methods of mathematical planning are beginning to be used, they play little role in the actual selection of investment projects. As a matter of fact, the selection is made not by models and computers but by flesh-and-blood people. Planners, managers of firms and nonprofit-making institutions, and members of other interested organizations often talk to each other: they argue, bargain, and "fight". This has the advantage of concentrating the information of all the parties concerned (both true and distorted information), which makes possible a clash of opposing opinions and interests and thus brings to the surface many foreseeable problems and difficulties. *The richness of information and the variety of the opposing interests are an important quality of the decision process here described.*

Yet the decision is taken by people who are not immune to *subjective influences*. We do not mean corruption, which does not occur in the selection of investments. The phenomenon is much more complicated. It may be a factor that the director of firm A has greater prestige than the director of firm B, and therefore it is more difficult to say no to the former. The parliamentary representative or the Chairman of the County Council may intervene to support firm C, while firm D has no supporter. A section leader formerly worked for firm E, and therefore he feels drawn towards firm E and not towards firm F where he has no acquaintances. Lobbies exist in the forms of mutually supporting groups of managers. It can

happen that investment goes not to the firm or nonprofit institution in greatest need but to the one that can put the largest pressure on the decision-maker. It is difficult to find out how far such effects operate. Although not decisive they can to some extent alter the decisions that would otherwise be based exclusively on arguments and computations.

We may now ask what roles are played in investment decisions by the *price* of output to be produced with the new capacity, and by *profitability* of the output. In making an investment decision, how far is preference given to the alternative which promises to be more profitable?

In the framework of traditional economic management, for a long time no computations of the expected profitability and of the investment had to be made at all. In recent years, however, such computations have been made compulsory and the results must be submitted with the investment proposal. These are partly calculations made at current or expected *domestic* prices (profitability calculations, in the strict sense of the word) and partly calculations made at "shadow prices" which differ from both current or future domestic prices. (In Hungarian usage they are called "efficiency calculations", which corresponds to "cost-benefit analysis" in English terminology.) Numerous kinds of "shadow prices" are used in socialist countries: "world market prices" determined in various ways, discount and exchange rates, and so on. In Hungary the scope of profitability and efficiency calculations has widened since the reform.

Our hypotheses are the following.

(1) *In the traditional system of economic management the criterion of profitability as calculated at current or expected domestic prices does not influence the investment decision.* The decision is not responsive to price. Selection of investments is almost exclusively a "quantity" control process.

Each participant in the decision, from the firm to the higher level planner, feels that if investment is shown to be important and advantageous by nonprice criteria, then there can be no problem with profitability either. The budget constraint on investment expenditure is soft. The domestic price of the output made possible by the investment will sooner or later be adjusted to actual costs. It is not possible for an investment to be completed and then fail subsequently, in the sense that the firm goes bankrupt.

Efficiency calculations made at shadow prices may exert some influence on the allocation; however, their influence is much weaker than that of other, nonprice criteria.

(2) *As a result of the reform of economic management the effect of the profitability criterion has strengthened somewhat, particularly with investments*

financed from the firm's own resources. However, this effect is still much weaker than those of nonprice criteria which are independent of profitability.

The hypotheses require empirical testing. Hypothesis (2) is in dispute among Hungarian economists. Some feel that the influence of the profitability criterion is stronger than we described it above. The question can be decided only by thorough examination. We mention a few methods of checking the validity of the hypothesis.

(a) How close is the relationship between on one hand the proportions in which the state redistributes investment resources between sectors, subsectors or types of output, and on the other the profitability of those sectors, subsectors and types of outputs? (This was already mentioned when we discussed softness of the budget constraint.)

(b) How close is the relationship between profitability, as shown in calculations attached to investment proposals, and the acceptance or rejection of the proposals?

(c) How reliable are *ex ante* calculations of profitability and efficiency? (This can be shown by comparison with *ex post* values.)

14.9. The effect of price on investment decisions: Inputs

The *input decision* for investments determines the input combination or technology chosen for the production activities specified by the output decision. We shall list a few criteria that have great weight in the choice of technology in the *traditional* system of economic management.

Engineering preferences. The engineer (as well as the planner and economic policy-maker under his professional influence) likes what is "modern" by a natural instinct of his profession. He prefers a more productive, reliable, and maneuverable machine to an older type, without regard to differences in the prices of the two machines. If at all possible, he would like to see the most up-to-date machinery and equipment in the factory.

Nonprice shortage signals. The decision-maker perceives in his everyday experience that there is "labor shortage", "foreign exchange shortage", and "shortage of construction capacity". He tries to be sparing of these resources not because wages, or the rate of exchange, or costs of construction are relatively high, but because he expects difficulties in acquiring the resources.

Foreign exchange quotas and foreign trade commitments. Authorities allocate some scarce resources administratively, by quotas. That is the

situation, for example, with convertible currency. This influences technological choice. As another example, in foreign trade between socialist countries intergovernmental agreements control many different kinds of concrete export and import transactions. Tie-in sale are not infrequent: if country A wishes to receive some product from country B that is much in demand on the world market, she has to accept together with it a product that is less in demand and more difficult to sell. Some investment goods fall in the latter category. In this way country B's supply of investment goods for export predetermines to a certain extent the investments and choice of technique for new projects in country A.

This is not a complete list of the criteria influencing the choice of technique. Yet these few examples are sufficient to illustrate what we call nonprice criteria.

The above-mentioned criteria may coincide. For example, the engineer's preference for modern equipment and protection against labor shortage both turn the decision-maker towards technologies with high labor productivity. In other cases, however, these criteria contradict one another. The most up-to-date machine favored by the engineer may perhaps only be available with convertible currency, which is particularly scarce. Such conflicts of criteria must be solved by compromises after disputes, bargaining, and competition for the scarce funds. Yet profitability calculations do not play an important role in this case either.

If the fundamental choice has already been made on nonprice criteria, perhaps some minor decisions may yet remain in which the cost-reduction criterion can come to the foreground. For example, the foreign exchange quota to be used for the project may already have been allocated. It is then worth considering whether the machines required should be ordered from firm M or firm N. Or, if two construction firms are ready to do the work, the cheaper one must be identified.

Let us summarize our hypotheses.

(1) *In the traditional system of economic management the investment input decision is not responsive to the relative price of inputs. In decisions between technological alternatives the cost-minimization criterion plays a small role.*

(2) *After the reform responsiveness to price in the choice of technique has grown somewhat, but is still not strong. It has a relatively greater effect in sectors and subsectors and small firms which are less well supplied with investment resources.*

Problems of empirical testing of the hypotheses will not be discussed for lack of space. But we shall raise one more question that is linked primarily

to the investment input decision but which also affects the output decision: the effect of the *interest rate*.¹⁶

Interest is paid on financial investment resources in several socialist countries including Hungary. The method of calculation and the actual form of payment differ from country to country, and they have changed in some countries over the years. Here we disregard the differences and try to make generalizations. For the sake of simplicity we shall use the expression "investment interest rate" for all forms of "prices" paid for the use of financial investment resources and for long-term credits.

A firm with a soft budget constraint is in practice wholly unresponsive to the investment interest rate.

On one hand the level of the interest rate does not influence total investment demand. It could be said that a change in this particular price has no income effect on the firm's demand. If the investment interest rate were raised tomorrow from 8 to 12 percent, investment demand would not decrease in the least. Each claimant would expect to be able to compensate for the 4 percent increase: either through price subsidies, tax allowances or, most probably, through price increases.

On the other hand a change in the investment interest rate has no substitution effect. *The firm or its superior authority making investment decisions does not respond to relative factor prices in the choice of technology.* Interpreting standard microeconomics as a normative theory, the firm ought to consider interest rate and wages as relative factor prices in deciding the capital-intensity and labor-intensity of the technology. This is out of the question. If the interest rate were doubled or halved, it would have no effect on the choice of technology. The latter is made, as we have already seen, on other criteria of a nonprice character.

In the intensive period of growth in a resource-constrained economy following the absorption of potential reserve labor, the decision-maker does not clearly perceive "relative scarcities". He is never in a situation to say that capital is less scarce than labor, or, conversely that labor is less scarce than capital. There is chronic shortage of both. His hunger for investment is insatiable; he feels that no solution of any of his persistent problems is conceivable without much more capital. At the same time, after absorption of the labor surplus inherited from the capitalist system, labor shortage becomes permanent. Whether the firm likes it or not, it

¹⁶A similar problem is presented by bank interest payable on current credits. This will be examined in Chapter 20.

must finally adjust itself to relative scarcities, since both investment resources and labor have physical limits. Yet relative factor prices do not play a role in this adjustment. As was explained in Part I, as the economy comes against bottlenecks and repeatedly hits resource constraints, it discovers what levels of investment and what factor combinations satisfy the currently given physical constraints.

After the reform the budget constraint has hardened somewhat. In spite of that it does not seem to have hardened enough to render the investment interest rate an effective regulator of total demand for investment or of the choice of the capital–labor combination.

14.10. Relative prices and shortage

After our examination of price-responsiveness of the firm on both the input and the output side and at all three stages of adjustment, we can challenge a rather widely held opinion. According to this view the main cause of shortage phenomena (or at least one of their most important causes) is to be looked for in wrong relative prices. The refutation of this opinion follows clearly from our analysis. *If all the circumstances described in the book – all the institutional conditions, control mechanisms, motivation, behavioral regularities – remain unchanged, no change in relative prices is able to eliminate shortage in the firm sector.*

Changes in the relative prices of products traded among firms may influence the intensity of shortage in the case of any single product. Since in terms of instantaneous and short-term adjustment the firm is responsive on the output side to relative prices to some extent, unfavorable prices may keep the firm from manufacturing certain kinds of products of which the shortage then increases. *Yet in the resource-constrained system shortage depends not on the supply side but on the demand side.* Supply can be of any size if demand always tends toward infinity. And this is exactly the situation if the budget constraint of the firm is not hard enough and if no economic force operates to constrain demand. Under such circumstances the firm's demand for both current and capital inputs is almost-insatiable. Whatever the relative prices of inputs are, there are and always will be numerous inputs for which demand is unsatisfied.

Our proposition has important theoretical and policy implications. Normative disputes about the relative prices of inputs are carried on in a vacuum if prices do not control the demand of the firm effectively.

14.11. A detour: The nonprofit institution

From Chapter 2 up to this point we have been dealing almost exclusively with the *firm*. Here we shall insert a few remarks about *nonprofit institutions*.

Let us look back to the questions treated in Part I. It is true that the output of the nonprofit institution is usually a so-called nonmaterial service, while most firms produce products and so-called material services. Therefore, the nonprofit institution did not receive a production plan as the firm did even in the traditional socialist economy. Yet apart from this the behavior of the firm and of the nonprofit institution is similar in many ways.

(a) Managers' motivation is similar; their primary identification is with the institution under their charge.

(b) There are a large number of such institutions demand for whose services is almost-insatiable (for example, health service and higher education). A queue of applicants forms. The urging of those in the queue as well as superior authorities often induce them to a "quantity drive".

(c) Increases in their activity come up against bottlenecks, usually on the input side. Their situation is characterized by resource constraints.

(d) Their hunger for investment is no smaller than that of firms. What is more, since they often suffer from postponement, their hunger for investment is especially intensive.

The difference in behavior between nonprofit institutions and firms is connected with their financial status. In this context it is worth discussing not just two but three types.

The first type is a firm operating under a hard budget constraint. It can count only on its own revenue from sales. The state will not help it out if it gets into financial trouble. Nor does the state interfere with its use of its own money.

The second type is a firm with a soft budget constraint. It relies mainly on its own proceeds. Yet if it is in financial difficulties the state will help it out. It is also true that the state intervenes in the spending of its money.

The third type is the nonprofit institution. It has no proceeds at all. It receives money to cover its expenses entirely from the state budget and the state also controls its expenditure.

It is worth remarking that the firm with a soft budget constraint is in a certain sense a transitory type: the more the constraint softens, the more the firm becomes a "quasi-nonprofit institution".

No unambiguous statement can be made as to whether the budget constraint of the nonprofit institution is soft or hard. *Before* approval of the budget, the constraint can be loosened. The nonprofit institution tries to put pressure on its superiors to get as much as possible to cover its expenses and for investment purposes.

In the course of *implementation* the hardness of the constraint depends on budgetary discipline. Experience has shown that in respect of current expenditures this is rather hard. Therefore, the nonprofit institution is rather responsive to the relative prices of current inputs. Yet the investment budget is as often exceeded by nonprofit institutions as it is by firms. Their responsiveness to the relative prices of investment inputs is rather low.

We make this brief reference so that later, in discussing macro-interrelationships we can take the behavior of nonprofit institutions into consideration. A more detailed analysis of the economic role of nonprofit institutions is beyond the scope of this book.

Price formation in the interfirm sphere

15.1. Introduction

In the preceding chapter we discussed, *how prices affect the firm*. Now we examine the opposite direction of causation, namely *how the firm affects prices*. This way of putting the question may seem unusual in the economic literature of socialist countries. Most of the literature deals exclusively with state price policy, and the principles and methods of central price policy. Our intention, however, is to demonstrate *that price formation is the common result of central price policy and the efforts of firms: prices change or remain unchanged as a result of conflicts and compromises between these forces*.

Hundreds of books and thousands of studies treat the question of prices in socialist economies. We made much use of this abundant literature,¹ although we do not attempt to summarize and evaluate its conclusions. Only a few problems will be selected from the broad subject area.

We intend in this chapter to stay close to the subject of the preceding two chapters, i.e. the *firm*. (Although, as will be seen, we shall also have to touch upon some general questions of price theory.) We take one category from the vast flow of transactions, that in which seller and buyer are both producers.² And we cannot cover the totality of prices even of this type. We disregard agricultural products because, owing to the limited size of the book, we cannot analyze the special political, social, and economic questions of agricultural prices. Thus, the subject of our investigation will

¹The following books are outstanding: Bálint (1970), Bródy (1967, 1969, 1970), Csikós-Nagy (1974, 1975b), Hoch (1972, 1979), Jávorka (1973), and Megyeri (1976); see also the following articles: Nagy-Esze (1963), Nagy (1967), and Szokolczay (1973).

²The "prices used for goods traded between producer firms" are a *subset* of a larger set that is usually called "producers' prices". The latter includes other subsets as well.

Because of space limitations this chapter cannot cover the prices of products sold by firms to households or to state foreign-trade companies, or the domestic market price of the imported produce goods.

be the *prices of intermediate goods bought and sold by nonagricultural producers*. For the sake of brevity we shall call these *interfirm prices*, and we ask the reader always to add mentally the further qualification that only *nonagricultural producers* are considered.

Even this narrow category of prices provides an opportunity to deal with a number of *general* problems of price theory. Further studies will have to decide whether our propositions hold for other categories of product flows or what modifications are needed.

One exception will be made: there is a further category of product flows not treated in the present chapter that we shall analyze later on. After dealing with the position and behavior of the *household* in Chapters 16–18, we shall examine in chapter 19 the formation of *consumer prices* faced by households. There we can use some of the results of the present chapter.

We shall restrict the subject not only by dealing with a certain limited category of prices, but also by approaching the price problem from a particular *viewpoint*.

We shall examine prices, here as well as later in Chapter 19, exclusively in a *descriptive* manner. In several past periods discussions on prices have developed in nearly all the socialist countries. In many of the discussions, however, as already noted in the preceding chapter, the subject of the analysis is what the price system *should be* and what principles and methods of price formation *should be* applied. While recognizing the extreme importance of this approach, we must state with regret that the literature offers little help in accomplishing the task assumed by the present book. We wish to find out *what role prices play in reality, what are the mechanisms for forming them*, and what economic forces cause them to change.³ This question is also treated in the literature, although to a much lesser extent than research focusing on practical proposals. And many descriptive works try mainly to give an account of the official rules for price formation. Practice may coincide with these rules, but it may also deviate from them. Rules are implemented by human beings who are influenced by their environment, their partners in discussion, “public spirit”, and is on. A few thorough case studies are badly needed to present a real and detailed history of the formation of individual prices.

Since we can rely very little on empirical examinations, our descriptive propositions are purely hypothetical. We shall put them forward in the hope that their validity will be tested by careful empirical observation at a later date.

³We may further ask what the *actual effect* of prices is. In the previous chapter we found the descriptive literature on this question to be wanting.

We further restrict ourselves entirely to questions that are closely related to the main subject of the book, that is, to *shortage*. Just to give a foretaste, we shall list the problems which belong here.

What tendencies towards price-drift appear in a chronic shortage economy, where firms have a soft (or rather soft) budget constraint? Does state intervention eliminate these tendencies?

It is apparent from the mere formulation of the questions that shortage is closely related to the phenomena mentioned at the outset, the *centralized* processes (starting from central price policy) and the *decentralized* ones (starting from firms) which affect prices. Conclusions regarding shortage will be drawn towards the end of the chapter. Our explanation begins with the *state control of prices*, and the *possibilities of as well as limits on* this control.⁴

In connection with some of our propositions and hypotheses we shall stress whether they apply only to the traditional system of economic management, or only to that operating after the reform. Elsewhere, however, we shall mention phenomena observable in a socialist economy without distinguishing the actual system of management.

15.2. Prices which are easy or difficult to administer

The view has become widely held that all or almost all prices in a socialist economy are controlled by the central organs of the state at their discretion. Some consider it an important merit of the socialist system, others regard it as a source of troubles. We shall not challenge either of these viewpoints, as we believe that it is largely simply a myth. Central economic control determines many kinds of prices and state price policy has a serious influence on the actual development of prices. Yet it is not omnipotent: it cannot (and maybe does not want to) “keep in hand” every price. Therefore, before discussing the role of state price policy, we would like to examine the objective constraints (independent of the authorities’ intention) on state control of prices, and the limits of the state’s powers.

Let us start from the situation where the government price authority wishes to set a price on a product and to ensure that the price is precisely observed. To do so, it has to settle the following issues amongst others.

(1) An exact, clear, and full *description* of quality must be provided for all the quality attributes of the product in question.

⁴What is said in Sections 15.2–15.4 also holds—*mutatis mutandis*—for consumer prices, treated in Chapter 19.

(2) It has to check whether the product in question is in fact sold at the officially prescribed price and whether all its attributes conform exactly to the parameters laid down in the quality description. If not it has to enforce its prescription exactly.

With some products the two requirements mentioned above are comparatively easy to satisfy. The quality of coal, oil, petrol, sulphuric acid, cement, granulated sugar or milk can be described by one or two parameters, or at the most by three or four. Let us call this category *standard mass-produced goods*. Most raw materials, some semifinished products, and mass-produced traditional foodstuffs with a low degree of processing come into this category.

Yet with other products tens, or hundreds, or maybe even thousands of parameters must be specified in order to make the quality description exact, clear, and full. Let us take, for example, a portable radio. There are a thousand variations. Even in the same country with identical market conditions the price of the most expensive type is a multiple of that of the cheapest type, which indicates the possibility of wide quality differences. And the portable radio is still a relatively simple device. Let us just think of the much more complicated products of the engineering and construction industries. We shall call this category of goods *differentiated products*.

Distinction between standard mass-produced goods and differentiated products is, of course, an abstraction. Obviously, there are numerous intermediate and transitional cases. Nevertheless, with most products after a little thinking we could state which of these two categories they belong to. And theoretical consideration of the problem is made easier if these two "pure" categories are considered.

The number of standard mass-produced goods has not increased much even over a long historical period. Most of them are traditional products. It is only from time to time that new products are added to this group. (Examples are some basic synthetic fiber products.)

On the other hand, the number of differentiated products increases continuously and rapidly. *One of the most important processes in economic development, as a consequence of technical progress, is differentiation of production and consumption.*⁵ Some products are driven out, but many more

⁵Product differentiation came to the center of attention in connection with the *theory of imperfect competition*. (See the pioneer works of Robinson, 1933, and Chamberlin, 1933.) Our observations at this point correspond to the findings of the theory of imperfect competition. In the case of intensive differentiation the assumption of strictly uniform price becomes untenable. It cannot be guaranteed either by an atomized market or by an administrative authority.

new ones take their place, and then the viable ones multiply by subdivision. Differentiation is a measurable category, for example we could state how many kinds of industrial products are manufactured in a country at a given time, distinguishing between products with the finest breakdown possible. Unfortunately, we have no such data. Yet it is likely that this differentiation increases much faster than the total volume of production. Many disapprove of fast differentiation: they consider it unnecessary waste, and view it mainly as manipulation of buyers. Others accept it, while criticizing excesses, as a sign of technological development and rising standards of living. We do not feel under an obligation to form a value judgement. We merely emphasize that the historical process under discussion seems to be *irresistible*.

The above remarks lead to important conclusions concerning government price control.

The price control for standard mass-produced goods can be administered easily, while that for differentiated products cannot. The more differentiated is production, the more difficult it is to determine prices in an administrative way and to enforce them.

With a differentiated product the producer can impose a *hidden price increase* without much difficulty.⁶ Two forms of it exist, though they are not mutually exclusive. The first is hidden price increase *associated with the introduction of a new product*. The price authority once fixed the price of a product, at the same time laying down all its quality parameters. In the meantime costs have risen, and the firm would like to increase the price. It produces a new type. It may in fact have useful new attributes, but it may have been changed only for the sake of appearance. The introduction of the new type gives an opportunity to have the increased costs recognized in the new price. The second form is a hidden price increase achieved *by reducing the costs of the old type*. This may be legal. When prices are fixed, quality is not prescribed in every detail. This allows, for example, the manufacture of a part from a cheaper or poorer quality material. Or the quality prescription may be contravened, in the expectation that the price authority will not be able to test the product in every detail. *The more differentiated production is, the greater the possibilities for both forms of hidden price increase.*

We have said of differentiated products that it is difficult for the state to prescribe their price, not that it is impossible. Much depends on the

⁶On hidden price increase see the article by Csikós-Nagy (1975a) and the book by Radnóti (1974).

capacity of the price authority. It depends on the number of staff dealing with the administration of prices, and their technological and commercial skill. It also matters a lot, what technique they use to simplify the complicated work of price formation and price control. In any case, although administrative capacity can be increased, it is still finite, while the process of differentiation is continuous and rapid. In consideration of these interdependencies we advance the following propositions.

As long as a country is at a low level of economic development, prices for most products can be easily administered. At a higher level of development, however, an increasing part of production can be administered only with difficulty. If the apparatus of the price authorities grows only to a limited extent, for example if it grows no faster than the rest of state administration, the proportion of all prices which can be administered effectively will be constantly diminishing.

We do not take a stand on the question of whether the apparatus of the price authority should be increased or reduced. We merely make a *prediction* based on the extrapolation of observable tendencies.

15.3. Administrative, pseudoadministrative, and contract prices

In the preceding section we talked about the *possibilities* of an administrative prescription of prices. On the basis of this analysis we shall survey the main forms of centralized and decentralized price determination.

One form is called *administrative pricing*. The price authority in fact prescribes the price and simultaneously lays down quality parameters exactly, clearly, and fully. In fact it controls and enforces the prescribed price and quality.

It can be seen that we have added the expression "in fact" to each term of the definition. It is not enough if everything is on paper only. It must take place in practice for us to call a price a genuine administrative price.

The other pure type is the *contract price*. Its main property is a negative one: it is *not* prescribed by an administrative order, but is agreed by buyer and seller. In a subsequent part of the chapter we shall examine what factors affect buyer and seller in determining the price and how the agreed price depends on the relative power of the two contracting parties. The contract price is influenced by general economic policy and measures of central economic control; it is also affected by state price policy through withdrawals of profits, taxes, subsidies, tariffs, and other measures, and

perhaps also in an indirect way by the administrative determination of the prices of inputs or substitutes. Yet by definition administrative pricing of the product in question cannot be counted here as part of state price policy, since otherwise it ought to come into the first category.

Finally, there is an intermediate form that we shall call *pseudoadministrative pricing*. Apparently, the price was laid down by the price authority, while *in fact* it was formed by the parties concerned, in most cases fixed by the seller and accepted by the customer. This would be the case if in fact the seller decided what profit he wanted on top of his costs, presented the detailed calculations so that the price would be acceptable – in accordance with given principles of price formation – to the price authority, and if the price authority did not go into the detailed technological and cost analysis of the product, nor into the market situation, but “put a rubber stamp” on the price proposed by the producer.

We note by the way that the problem we are discussing is one that arises not only in connection with price determination but with every central decision. Centralized and decentralized decisions can be clearly distinguished in cases where there are disputes between the central authority and the subordinate organization. If the former says A and the latter B, and the approved decision is A, it was certainly a centralized decision. But what if the central authority simply sanctions what the subordinate organization suggests in its own best interest? In such a case no unambiguous answer can be given to the question whether the decision was in fact centralized. What is more, in the case of pseudoadministrative pricing this is not the only question. As will be explained in detail later on, the firm’s suggestion is often opposed to the general objectives of central price policy, to the requirement of a stable price level for example. Yet if on paper it does not clash with the principles of price formation and methods of calculation, the suggestion will get the central stamp and signature, and from that time it qualifies as an “administrative price”. And yet the firm got what it wanted and what it would openly have got as a contract price. The price is in fact contrary to the true principles of the central price authority. For this reason we call this form pseudoadministrative pricing.

The breakdown of the three forms is closely related with the classification in the preceding section, that is with whether or not the price of a product can easily be administered. The interrelation is represented in fig. 15.1.⁷

⁷The figure presents only the logic of the interrelations. Neither the width of the columns, nor the height of the bands represent quantitative ratios.

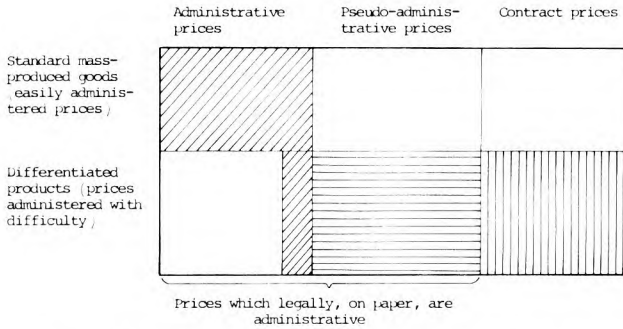


Figure 15.1. The administration and administrability of prices.

Let us assume that the price authority wishes to extend the scope of administrative prices as far as possible. It can prescribe a genuine administrative price for standard mass-produced goods (first row, first column) without any particular difficulty. Depending on its administrative capacity, it is also able to prescribe genuine administrative prices for a small number of differentiated products (the thin, cross-striped section of the second row, first column). The prices of all other differentiated products, which cannot easily be administered, will not be genuine administrative prices. This is either openly acknowledged by the price authority (second row, third column, vertically-striped) or the authority pretends to prescribe administrative prices, which it is unable to enforce (second row, second column, horizontally-striped section).

The differentiation of products and the increasing difficulty of prescribing prices administratively are independent of legal regulations concerning price determination. It does depend, however, on the system of economic management whether the difficulties are openly acknowledged; for example, whether the center prescribes administrative prices for differentiated products where only an illusion of state price determination would appear. The Hungarian reform of 1968 made an important step forward in comparison with the earlier position when it gave up this illusion for a considerable part of products. That is the situation for example with a great many products produced by the construction and engineering industries, and traded between state firms. The price authority could not control their prices anyway. Since the reform it has not even pretended that these prices are centrally prescribed.

The three forms of pricing mentioned above must be clearly distinguished, because economic managers can only fix *genuine* administrative prices *at their discretion*. Contract prices are formed by a more or less decentralized process which is controlled by internal forces and specific mechanisms. And pseudoadministrative prices, are formed in a similar manner to contract prices. In spite of the "official stamp" they are mainly formed by a decentralized process. Therefore, it is not sufficient to understand the intentions of price policy; we must also be acquainted with the nature of decentralized pricing processes if we are to see clearly what factors affect this intermediate form of pricing.

15.4. Measuring the price level

We have to make a short detour at this point to touch upon questions of measuring the price level. The difficulties are well known,⁸ and it is exactly the problem discussed above, i.e. the recording of quality, that is the chief concern. While the product composition of commodities is permanently changing it is almost impossible to find out whether a change in price expresses a quality change and whether it is a genuine change in price. Although this is a general problem for all systems, there are special additional difficulties in the socialist economy.

In a few advanced capitalist countries successful econometric investigations have been carried out to clarify the interrelations between quality and price.⁹ This can be successful, however, only if a buyers' market prevails. There the customer is prepared to pay a higher price for A if in his judgement it is better than B. Therefore, the price difference between A and B expresses, at least approximately, the consumer's valuation of the difference in quality between the two products.

In chronic shortage conditions, however, if the buyer cannot implement his choice and if he is forced to substitute A for B, because B is not to be had, any possible price difference says nothing about quality differences.

⁸From the theoretical literature on price indices see Frisch (1936, 1974), Köves-Párniczky (1973), Drechsler (1966, 1974), and Maunder (1970). The practical problems of international comparison are illustrated by the study of Hungarian and Austrian consumer prices undertaken by Marton (1976).

⁹See Griliches (1968) and numerous articles in Griliches (1971). The interrelation of quality and price is also analyzed by Drechsler (1974) and by Zafir (1974) who use another approach.

Therefore, the econometric methodology used to investigate the interdependence of price and quality by observing buyers' actual choices cannot be applied in a shortage economy.

Otherwise, such investigations are rare even in capitalist countries, and are usually limited to research of a scientific character. The official price statistics have not successfully overcome this difficulty. Nor can they capture the phenomenon of hidden price increases. The latter are not infrequent in advanced capitalist countries, where several big firms may be reluctant to announce unpopular price increases, and prefer to conceal them behind changes in the product. Notwithstanding all this we have the impression that difficulties of measurement are greater in socialist countries, not because statistics are less developed, or reports less honest, but because of the nature of the processes under observation.

Let us assume that in a capitalist country, in which the state does not intervene in price formation, statistics register the price movements only of products which are *intertemporally comparable*, all quality parameters of which are unchanged over time. This group of products coincides more or less with what we called standard mass-produced goods. Under the given social conditions these products may represent very well the totality of products with respect to price movements. Since capital can be continuously reallocated, it is improbable that standard mass-produced goods would be permanently either much more profitable or much less profitable than other products. It may be assumed, therefore, that if price statistics base the price index on observations of prices of intertemporally comparable goods, the estimates obtained will not be biased in either direction.

The situation is different in a socialist economy. There *the list of products capable of intertemporal comparison for the compilation of price statistics coincides more or less with the list of goods whose prices can easily be administered*. With these products the price authority is able to enforce the administrative price, whereas with contract and pseudoadministrative prices price stability cannot be guaranteed. Owing to cost-push or demand-pull, prices in the latter category may be rising, while with administrative prices the state can successfully counteract the tendency for price-drift. If price statistics are centered, understandably, on the observation of changes in prices of intertemporally comparable products, the price index will be biased downwards.

The same downward bias may also appear in the price statistics of capitalist countries, if the prices of some or all standard mass-produced goods are administratively determined, and if the administrative prices are

enforced. In this case the changes in the prices of intertemporally comparable products do not faithfully represent the change in the general price level there, either.

15.5. Forces encouraging and counteracting price-drift: The role of the firm's interest

We needed the results of sections 15.2–15.4 before turning our attention to the next subject, an examination of the *movement* of interfirm prices. The remaining part of the chapter is concerned with the category of prices described in section 15.1, even if we do not always put the words “inter-firm” (or, even more exactly “between nonagricultural producer firms”) before the word “price”.

First we make an abstract distinction: we separate *centralized* effects influencing the development of prices from *decentralized* ones. In reality the two groups of effects may interact. However for clarity of analysis we shall sharply distinguish them on an abstract level. Initially we shall only discuss decentralized effects. Accordingly, genuine administrative prices will be excluded from the scope of analysis and only contract and pseudo-administrative prices will be treated.

Of course the state also influences the absolute magnitude of contract and pseudoadministrative prices through taxation, financial support granted to firms, and so on. But let us assume that financial relations between the state and the firm (tax rates, levels of financial support, etc.) do not change from one year to the next. Since we are going to deal precisely with the effects of such changes in the next two sections, it is permissible to neglect for the time being the effort of government measures.

The first stage of the analysis will be a discussion of the *interests of firms*. Our starting point is the following proposition.

*The socialist firm, both as seller and as buyer, has an incentive to increase prices. Both the cost-push tendencies (shifting increases in costs onto the buyer in the form of higher prices) and the demand-pull tendencies (the unsatisfied buyer offers a higher price) can be discerned in the behavior of the firm.*¹⁰

¹⁰On the distinction between cost-push and demand-pull inflation see, for example, Machlup (1960), Radnóti (1974), and Csikós-Nagy (1975a).

Is there no logical contradiction between the above proposition and our earlier assertions that the socialist firm is not particularly responsive to price? Earlier we stated that the firm's budget constraint is soft in the traditional system of economic management, and did not become hard even after the reform. But if this is true, why should the seller strive to raise prices? And why should the buyer try to influence the seller by offering a higher price?

In my view there is no logical contradiction at all. We must only beware of interpreting earlier propositions found in the book in a rough and inexact manner. We emphasized that the softness of the budget constraint manifests itself not only by the firm shifting a possible rise in costs onto the state, but also by its shifting it onto its own buyers in the form of price increases. We stressed that the firm, in spite of the softness of the budget constraint, is not indifferent to profitability and that in forming the composition of output it does respond to some extent to output prices.¹¹

What is contradictory is not our analysis, but the situation of the firm and the relationship between seller and buyer in price formation. Two aspects of our analysis which we have already used several times will be of some help to us in understanding this relationship. One is the clear distinction between instantaneous, short-term and long-term processes. The other is the asymmetry between buyer and seller.

Let us first consider the *traditional* socialist firm, in its role as producer and seller. It has a double interest in taking action which—directly or indirectly—contributes to raising the prices.

(a) The firm is given a taut short-term *production* plan. The most important plan target carrying the strongest financial and moral incentive is the aggregate output plan. (See section 3.2.) It is easier for a firm to fulfill a given short-term plan if it produces as many as possible of the more expensive products. This may happen in the way described in the preceding chapter; with given prices the firm incorporates as many of the relatively more expensive products as it can into its operational (daily or weekly) production program. This shift in the composition of output may contribute to raising the average price level.

The second method may operate simultaneously with the first and interact with it; it is open or hidden price increases.

¹¹On the importance of the price-making role of the firm in softening the budget constraint, see section 13.5; on profitability, see section 13.9; and on responsiveness to output prices, see section 14.6.

(b) The centrally prescribed short-term plan also comprises *financial, cost, and profitability targets*. True, these usually have a weaker effect than the target for aggregate output, but their fulfillment still influences the firm's decisions and perhaps even its financial position. Should costs rise in the course of implementing the short-term plan and should profitability develop less favorably than planned, this would be disadvantageous for the firm. This prompts the managers of the firm to try, at least in a concealed form, to raise prices. (Here the elements of cost-push price-drift can be seen.)

Neither of these two motives is particularly strong; they only affect the firm in the short run. The managers realize that, when the next short-term plan is set, the financial results already attained will be taken as the basis of the next production and financial plans set by the higher authorities. And managers know that in the last resort neither the survival of the firm nor its growth depend on financial results.

Although the *producer's efforts* to raise prices are not very strong, the *customer's* resistance is even weaker. He may feel that if he yields to the seller he may gain the goodwill of the latter and together with that the desired input. (This is a demand-pull price increase.¹²) And the return to the firm in terms of fulfilling its production plan or realizing an investment in process may exceed the rise in cost, if only because the customer, in his other role, is a seller and may itself do anything that is done to him by the firm from which it purchases its inputs.

To sum up, there is still a tendency, even if not a strong one, towards price-drift. *Since the reform of the management system* the firm has received no short-term plan targets covering either production, costs, profitability, or financial variables. It is thus no longer prompted to raise prices in order to fulfill or overfulfill these plans. But its interest in increasing profit has grown. Whatever the actual form of financial incentives (bonuses paid to firm's managers depending on profit, profit sharing for workers, the possibility of investment financed from the internal savings of the firm, etc.), the firm would like to earn more profit. This may stimulate it, among

¹²We recall section 4.7 where we first became acquainted with the notion of *the buyer's attitude*. We mentioned there that the efforts made by the buyer to win over the seller are one component of this attitude. Further components were mentioned in Chapter 14 on the responsiveness of the buyer to input prices. Here we describe another component, the strength of the buyer's resistance to the seller's efforts to raise prices. The various elements jointly characterize permanent features in the buyer's behavior (and also affect one another).

For the sake of brevity, the parallel elements of the *seller's* attitude will not be reviewed.

other things, to give preference in production scheduling to goods which secure higher profit, and this may contribute to increases in the average price level. At the same time, it will try to raise prices, openly or covertly.

The producer may be forced to do so by a rise in its own costs. (This is cost-push price-drift.) True, in the last resort the firm may attempt to shift the burden of more expensive inputs onto the state. Yet it is more comfortable, if it does not need to ask for state help, but can shift the burden – almost imperceptibly – onto the buyer. And, of course, it is worth trying to raise prices even if no increase in costs has taken place – merely in the interest of higher profits.

We must add, however, that the incentive to raise prices is not very strong, even in the case when the profit motive is at work. If the attempt succeeds, well and good, but if it does not, no mortal peril will arise on this account.

The customer, being himself interested in profit, is in two minds. On the one hand, it would be expedient to resist the seller, since, in the final analysis a rise in costs will impair his own profitability. On the other hand his resistance will be slackened, for reasons already mentioned, and he may even outbid the price set by the seller. (This is demand-pull price drift.) The shortage economy, the quantity drive, and the expansion drive form the atmosphere in which he lives, and this is why the most important thing for him is to get the input. If necessary, he prefers to pay the higher price. If this leads to an increase in his own costs, he too tries to pass it onto his own buyers¹³ or to the state.

Our hypothesis is the following: *interest in profits, if not coupled with a substantial hardening of the budget constraint, increases the tendency towards price-drift. Since the reform both the seller's attempts to raise prices and the customer's resistance to higher prices have grown, but the former more than the latter.*

Important general theoretical conclusions follow from what has been said. If we look at the relationship between seller and buyer in forming price in a *static framework* and *on the submicro-level*, their interests are diametrically opposed. We have here a “zero-sum game”. The buyer loses as much as the seller gains, and conversely.

But quite a different picture will emerge if we examine the processes in a *dynamic framework*, on the *micro-level*, observing many products together

¹³This is well exemplified by a quotation from an interesting case study: “The firm... continually looked for an opportunity to raise the price. The rise in the cost of materials which occurred in the meantime made this possible... After agreement had been reached between the supervisory ministries, the parties considerably raised the price”. (See Vince, 1977, p. 33.)

the circular relationships between buyers and sellers and the continuous repetition of purchases and sales. This is no longer a “zero-sum game”. The buyer does not continually lose what the seller gains, since he can always pass on his momentary losses.

15.6. The effects of shortage and rising costs

Let us remain for the time being with *decentralized* effects on prices. Let us assume that in some socialist economy the system of economic management is given together with the form of financial and moral incentives for the firm, the normal degree of hardness of the budget constraint, and so forth. *What further explanatory variables* affect the tendency towards price-drift?

While making no claim to completeness, we emphasize two types of phenomena: the effects of *shortage* and of *cost increases* occurring outside the firm. Both have been already touched upon several times in the preceding section, but now we discuss them in some detail.

In the preceding section we considered a factor, the motivation of the firm, which affects the whole firm sector almost *uniformly*. Now we pass to examining factors which operate with different strength in particular markets.

Let us start with the effect of *shortage*. In the preceding section we made it clear that the buyer firm offers little resistance to possible price increases made by the seller; in fact, it may initiate the price increase itself. We noted that this phenomenon may occur in the traditional firm, but it gathers momentum after the reform of economic management. We now assert that the *extent* to which the phenomenon operates depends on the intensity of shortage of the input in question. *The more intensive the shortage in some particular market, the more the buyer is inclined to tolerate an open or hidden increase in input prices on the part of the seller and the more he is inclined to offer a higher price himself.* This demand-pull effect of chronic shortage, or suction, can be felt most palpably in the markets for investment goods and services. The continuous increase of the price of construction may serve as an example. This is a characteristic result of the chronic tension on the investment market.

As a matter of fact, we have here a *unidirectional* causal relationship. *A high degree of shortage operates to raise prices, but there is no reverse relationship: a higher price does not lead to a lasting easing of the tension.* On the submicro-level, payment of the higher price may work for the buyer.

He obtains the input which he greatly needs, and perhaps he will be preferred to his competitors. The intensity of shortage has momentarily diminished for him. But *on the micro- and macro-levels*, for the whole firm sector in which purchases take place continuously, the normal intensity of shortage has not diminished. On the *supply* side, relative prices may momentarily influence the composition of output, but they do not basically affect the total volume. (See Chapters 6 and 14.) The main thing, however, is not supply, but *demand*. The demand of all firms is almost-insatiable, even with higher prices. (See Chapters 5, 13 and 14.) Therefore, the actual intensity of shortage continues to fluctuate around the normal level. We shall revert to this highly important proposition, that a general rise in prices does not reduce the normal intensity of shortage, in later chapters of this book.

We now turn to the effects of *higher costs*. What factors operating *outside* the buyer-producer firm may lead to rising costs?

(a) The foreign price of imported materials, intermediate goods or machinery and equipment may increase. If the state does not intervene, and if the domestic price is converted at an unchanged rate of exchange, a price rise abroad may lead to an increase in domestic costs.

(b) The price of domestically produced materials, intermediate products, or machinery and equipment may increase. It is a different question why this occurred; every factor mentioned in the last section and in the present one may have played a role. However, if a price rise has occurred, it increases costs for our firm.

(c) Nominal wages and taxes linked to wage costs may increase for reasons outside the control of the firm, for example as a result of government measures, regulating wages, by a greater amount than the increase in productivity within the firm. (The determination of wages will be discussed in detail in Chapter 16.)

Besides the above factors operating *outside* the firm, factors *inside* the firm may also contribute.

We recall the relationship described in section 12.5. The firm's marginal cost curve is U-shaped. As capacity is utilized more intensively the marginal costs rise more and more steeply. Production more and more frequently hits resource constraints with several harmful consequences. Forced substitution occurs with greater frequency and increases costs. There is more overtime, more waste and more shoddy production, the machinery deteriorates, and so on. There is a growing tendency to hoard stocks of inputs, which increases the costs of storage and also interest due. In the last resort, *there is a close relationship between the high levels of*

capacity utilization and shortage on the one hand, and the steep increases in marginal costs on the other. Shortage works to drive up the price through both causal chains both by the demand-pull and cost-push mechanisms.

To facilitate our survey of cause-and-effect interrelations we present fig. 15.2. Each field in the figure symbolizes a group of phenomena. The fields are denoted by capital letters (M, Z, and so on). The subscript i beside a letter indicates the i th product group; while those without a subscript refer to the whole interfirm sphere. Each field represents one *explanatory* variable, except for the field on the right-hand side, which represents the *explained* variable, the tendency towards price-drift resulting from decentralized factors $P_i^{\text{decentr}}(t)$. This is a national price index; for the i th partial market between years $(t-1)$ and t , if prices were affected exclusively by decentralized factors.

As a matter of fact, fig. 15.2 illustrates the relationship between the explanatory and dependent variables; that is, it outlines a *price-drift function*. The explanation above showed the direction of dependence and some of its characteristics. But we do not have sufficient knowledge of the nature and quantitative characteristics of the relationship, and thus cannot describe it exactly.

The main direction of causation is illustrated in the figure by arrows from left to right.¹⁴ But we draw attention to the fact that there are two kinds of interactions; that is, there are also arrows from right to left.

One of these is the “*price, cost, price*” spiral. Fields C_i , P_i , C , and again C_i are connected by a loop. Costs increase for the producers of product group i ; this raises the price index P_i^{decentr} , increases costs for product groups k, j , etc. and raises the prices of these products; this may again increase the costs of production for product group i , and so on. This phenomenon is well known from the theory of cost inflation.

The other interaction is between the tendency for price-drift (*Field P_i*) and the degree of softness of the budget constraint (*Field M*). We have emphasized from the outset that softness of the budget constraint may appear in two forms. The firm may shift its losses onto the state and it may also shift them onto the customer. The softer the constraint, the more the customer tolerates the latter (because he can shift his own losses onto his customers or the state)—and the budget constraint “becomes softer” precisely because this operates everywhere. In this sense the phenomena indicated by *Field P_i* and *M* are both cause and effect at the same time.

¹⁴In order to simplify the rather complicated figure we do not illustrate those interrelations between the softness of the budget constraint and shortage which were extensively dealt with in earlier chapters.

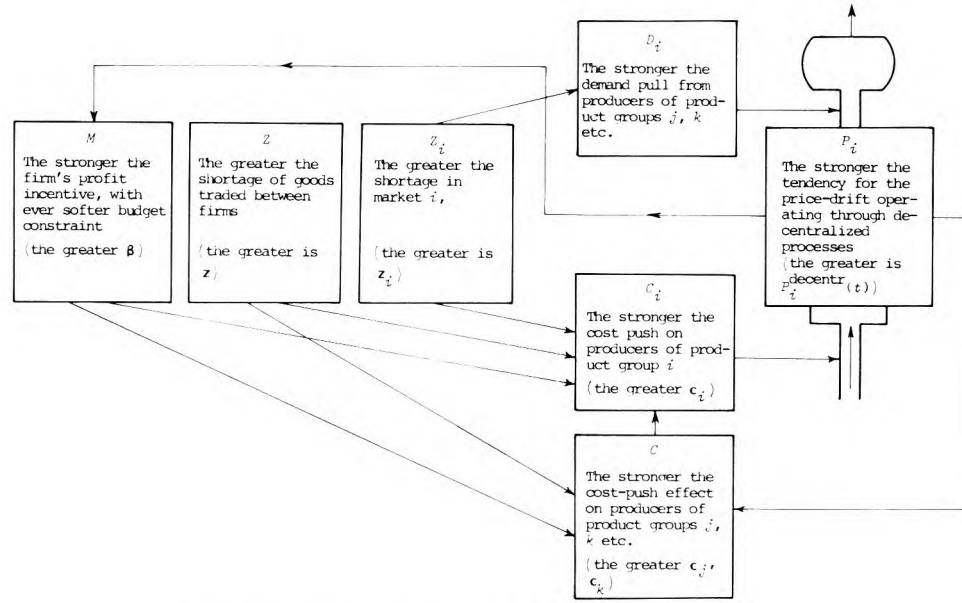


Figure 15.2. A diagram illustrating tendencies towards price-drift.

15.7. State intervention on interfirm prices

Having presented in fig. 15.2 the *decentralized* process that drives up prices of goods traded by producers, let us now turn our attention to *centralized* control of prices. Not only official declarations but also actual experience prove that *in a socialist economy one of the most important aims of state price policy is price stability*. If the state does not or cannot achieve this aim perfectly, at least it strongly resists the spiralling of prices by trying to set an upper limit to price increases and keep them at the planned level. Price policy has other objectives as well, but if there is a conflict between objectives, *then stability is given priority in the majority of cases*.¹⁵

Let us denote by $P_i^{\text{centr}}(t)$ the price index which the central price authority *desires* at time t . This expresses the aspiration level set by the economic leadership. The *actual* price index $P_i(t)$ will be as follows:

$$P_i(t) = \rho_i P_i^{\text{centr}}(t) + (1 - \rho_i) P_i^{\text{decentr}}(t). \quad (15.1)$$

actual price index	re- sistance para- meter	price index centrally desired	price index formed through decentralized processes
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The price index $P_i(t)$ on the left-hand side is an *ex post* magnitude, while the indices $P_i^{\text{centr}}(t)$ and $P_i^{\text{decentr}}(t)$ are *ex ante* magnitudes.

In this formula the parameter ρ_i measures the effectiveness of state *resistance* to price-drift in market i . If $\rho_i = 1$, resistance is absolute; the price level desired by the state is realized. If $\rho_i = 0$, there is no resistance on the part of central authority; the price level is entirely the result of decentralized processes. In the case of an intermediate value of the resistance parameter there is some resistance, but the price-drift arising from the decentralized processes also operates to a certain extent. This intermediate situation [$0 < \rho_i < 1$] is most characteristic of price formation in the interfirm sphere.

Formula (15.1) is analogous to relationship (16.11) to be presented in the next chapter in connection with wages. There we describe a spontaneous tendency towards *wage*-drift and here a spontaneous tendency towards *price*-drift; there, as here, the parameter ρ_i expresses the state's resistance

¹⁵We emphasize the restriction "mostly" in the above sentence. There may be periods when, for various considerations, economic policy does not give priority to price stability. But, if we survey the decades of history of any socialist country, such periods seem to be exceptions, which do not invalidate the rule that the priority is given to price stability.

to the tendency. We wish to emphasize that *there is no such "built-in" mechanism in a socialist economy guaranteeing price or wage stability. On the contrary, "built-in" mechanisms and incentives of the firms work towards inflation in prices and wages.* If price stability is preserved, this is a consequence of active resistance to increases.¹⁶ If resistance slackens (i.e. ρ_i is reduced), the tendencies towards price- and wage-drift may grow stronger.

In Chapter 11 we pointed out that elimination of unemployment, is one of the greatest achievements of the socialist system and in the last resort is not the result of economic management or economic policy. The inner laws of motion of the system lead sooner or later to the elimination of unemployment. Another achievement of the socialist economic system is that whereas in several developed and developing capitalist countries inflation has accelerated, socialist countries have succeeded in maintaining price stability, or at least in preventing anything more than rather slow, creeping inflation. This second achievement, as opposed to the elimination of unemployment, is not automatic. It is not guaranteed by inner laws of motion, and it may be achieved only through active government measures.

What are the instruments of central price policy?

(1) The most obvious method of intervention is prescription of administrative prices. Although it is true that the circumstances under which this method can be applied are not too wide, it can be very effective. We only need recall that the prices of most important raw materials, energy, and semifinished products can easily be administered, and that fixing these prices has a stabilizing effect on the costs and prices of products for which they are used.

At a low level of economic development it is easier to secure price stability by prescribing administrative prices, since the prices of a high proportion of goods are easy to administer. The more developed the economy becomes, the greater the differentiation of output and, consequently, as was pointed out in section 15.3, the smaller the proportion of prices which can be administered. If the price authority still tries to attain price stability using mainly fixed prices, pseudoadministrative prices will appear in ever greater numbers, and tendencies towards price-drift may break through in disguised form. This can also be expressed by stating that

¹⁶According to Csikós-Nagy "...in most socialist countries the price level would be higher if the governments did not regulate prices. In other words money relations operate in such a way that their inflationary effect can only be prevented by price fixing...In the long run the price level in some socialist countries rises rather than falls although prices of individual products are reduced from time to time." (See Csikós-Nagy, 1975b, pp. 146, 151, and 1974.)

government resistance to price-drift, parameter ρ_i in formula (15.1), is a decreasing function of product differentiation.

(2) If the cost-push tendency is strong, the central authorities may forestall the rise in price by improving the financial position of the firm by means of state redistribution. They may subsidize either the whole firm, or particular products. Or, if the firm is already receiving such subsidies they can be raised. Perhaps the burdens of the firm can be reduced by tax exemptions or in some other way. It is as if some steam is released from an overheated boiler; the internal pressure diminishes.

But this is a contradictory instrument. On the one hand, it may *instantaneously* prevent the trouble from spreading. A government subsidy given at a suitable place and at a suitable moment may break the "cost, price, cost" spiral. On the other hand the firm is demoralized by state subsidies and is thus no longer forced to reduce costs. The budget constraint becomes soft, and as we have repeatedly emphasized this leads directly to the perpetuation of shortage, which amplifies the tendency towards price-drift both *in the short and long run*. (See the interrelations shown in fig. 15.2.)

(3) As well as the direct methods presented above there are indirect methods for calculating costs, laying down which costs can be counted, and how much profit can be added to the unit production costs thus calculated. If frequent and thorough checks are made to see that the rules are observed, and if transgressions are punished, this will restrain the firm's efforts to raise prices.

State intervention may be complemented by the controlling influence of public opinion and by the Press and political organizations. A "social climate" develops that condemns open or hidden forms of price increase.

The influence of these indirect effects is restricted. They may restrict the tendency towards price-drift but are incapable of containing it.

(4) The crucial question is whether the demand constraints of buyers can resist the price-increasing efforts of the sellers. We cannot answer this question at this point. We have postponed until later our investigation of household demand and a discussion of the total quantity of money coming into the hands of firms and nonprofit institutions. Only after this can we undertake the *macro*-analysis of demand. But it is already clear from the *micro*-analysis of the firm sector that firms' demand for inputs for current production and particularly for investment is almost-insatiable, primarily because their budget constraint is not hard and their financial position sets no effective limit to their purchasing intentions. Taking notice of this justifies us, even before a full macroeconomic exposition, in advancing the following proposition.

In a socialist economy the authorities withstand the tendencies towards price-drift generated within the firm not with fiscal and monetary policies, but with price and wages policies. They are successful to a certain extent, though – as we have seen – the effectiveness of these policies is limited.

Let us now return for a moment to formula (15.1).

There is interaction between the centralized and decentralized elements in price-formation. On one hand decentralized tendencies towards price-drift affect government measures. In many cases the administrative price simply “sanctions” the price that would be formed, anyway, by the decentralized processes, shown in fig. 15.2. Or, if an administrative price deviates considerably from the price desired by the firm, financial support may be granted to the firm, lest it should resist an administrative price which leads to losses. As a matter of fact, we could say that the price index desired by state price policy (P_i^{centr} in formula (15.1)) is from the outset not very far from the price index P_i^{decentr} that would be formed as a result of contracts between firms.

On the other hand the active resistance to price increase shown by the central authorities and the “social climate” has a restraining influence. It is not worth going too far, as a strict administrative price might be prescribed or “excess” profit might be taxed away or the firm driving up prices might be publicly unmasked. This self-restraint may bring the price indices P_i^{centr} and P_i^{decentr} closer to each other.

15.8. On the price-theoretical background

As we are coming to the end of our examination of interfirm prices we shall make a few remarks about the *theoretical* background to the problem. Theory likes pure cases such as (a) “price unit cost plus normal profit”,¹⁷

¹⁷The price theories of the *classical* economists agree, in spite of substantial differences between them, that *capitalist* economies operate on a “cost plus normal profit” rule for price formation at least as a general tendency. This is formulated in the model of the *Marxian production price*, and in the price theories of the *neo-Ricardian school*. See Marx (1867–1894a, b). There are several attempts at modelling this mathematically, the contributions by Brödy (1964, 1969, 1970) are outstanding. See, furthermore, Kalecki (1964), Kaldor (1960a, 1960b), Robinson–Eatwell (1973), and Sraffa (1960a, b). An approach in similar spirit was developed by P. Erdős (1976) and further elaborated by T. Erdős (1977, 1978).

The “cost-plus” rule is also expounded on the basis of empirical observation by several economists who – as regards their theoretical roots – are far from the Ricardian and Marxist currents.

It should be added, however, that others, also relying on empirical observation, deny that the “cost-plus” rule of price formation operates in capitalist economies, even as a dominating tendency.

or (b) “the Walrasian equilibrium price balancing demand and supply”, or (c) “fully arbitrary administrative price”. These are three examples of pure cases. However, much as such models would facilitate a theoretical analysis of the problem, none of them describes satisfactorily the formation of interfirm prices in socialist economy. The foregoing account contains elements of all three pure models. This is not because the author is particularly attracted to an eclectic theory as opposed to pure models, nor even because on the basis of a personal value judgement he would like to arrive at some synthesis of the various price models. It is simply that actual experience shows a peculiar mixture of the various pure principles of price formation, as we now show.

By (a) an increase in costs pushes prices up. This establishes a relationship between the actual development of prices and the price formation rule based on cost. But recognizing this relationship does not mean that the socialist economy operates on the principle that “price = unit cost plus normal profit”. This is not so, if only because in this system there is no *normal* profit.¹⁸

We restate what was emphasized earlier, that in our framework a “norm” is not a simple statistical average. Of course, the individual rates of profit do have a statistical average. But this becomes a *normal* rate of profit only if a social mechanism operates which drives the individual rates of profit which deviate from the normal one back near the norm. In a socialist economy elements of such a mechanism may be found in the form of government interventions. Serious losses are not tolerated for long, but sooner or later, in the course of general price revisions, attempts are made to eliminate them (although there are considerable exceptions). “Excessive” profits are also sooner or later taxed away. But this mechanism operates with many frictions and lags, through “spasmodic” interventions. And in any case only profits are redistributed. There is no reallocation of capital underlying the process; real capital does not flow from the loss-making or less profitable places to the more profitable ones. Under such conditions no uniform, socially accepted norm for the rate of profit can develop.

It is outside the scope of this book to describe the development of prices in capitalist economies. It is certain however that the principle of “cost plus normal profit” has not become the dominant rule for price formation in the *socialist* economies, as we now show.

¹⁸We do not here clarify the precise relationship between profit per unit of output (expressed as a percentage of the unit price or the unit cost) and the rate of profit (expressed as a percentage of capital). It would be superfluous to discuss since our proposition is the negative one that there is no norm in terms of either of the variables.

According to (b) unsatisfied demand may prompt the buyer to raise the price. This creates a relationship between the actual development of prices and the Walrasian model of a price mechanism which establishes equilibrium between demand and supply. But a tendency towards demand-pull inflation would not by itself ensure a lasting Walrasian market equilibrium, even if there were no resistance to it from government price policy. *A tendency for prices to rise is compatible with a non-Walrasian normal state perpetuating a high intensity of shortage, provided that the socio-economic conditions, control mechanisms, incentives and rules of behavior which perpetuate the shortage have become established.*¹⁹

According to (c) the state sets administrative prices for goods which may essentially differ from either “costs plus normal profit” or the “Walrasian equilibrium prices”. To this extent reality bears some resemblance to the third “pure” model of “arbitrary” administrative pricing. But, in fact, in a developed economy with differentiated products many prices cannot be administered. Actual prices are substantially influenced by decentralized processes.

The proportions in which the three “pure” kinds of rules for price formation are combined may vary. They depend at any time on the form of economic management, on price policy, on the level of economic development, on the current situation of the economy, and so forth. But it seems to be *a general property of price formation that the three “pure” rules are always combined. In the socialist economy prices of goods traded by firms are the result both of government price policy and of the operation of decentralized processes.*

¹⁹Chapter 20 on money and Chapter 21 which discusses macro-interrelations justify this statement in detail.

Wages

16.1. Introduction

Although we indicated in Chapter I that the Hungarian economy serves as a background for the whole book, in the chapter on wages it should be emphasized right at the outset that we are writing here primarily about Hungarian experience.¹ It is an open question how far this can be generalized to other socialist countries.

We shall discuss only the *state* sector, that is the wages paid by the state-owned firms and nonprofit institutions.² We shall not deal with money incomes paid by cooperatives to their members. Similarly, we shall neglect personal incomes accruing from outside the sector comprising firms and nonprofit institutions.

One of the main topics in our analysis is *central wages policy*. The general guidelines are determined by the highest political leadership and the government, after consultation with the central leadership of the trade unions, and their implementation is compulsory for the whole economic system.

Nowadays every government in the world has a wage policy, whether enforced or not. In a socialist economy the analysis of wages has to start from central wage policy because the latter is actually enforced. Hardly any indicator in the economy-wide plan is fulfilled more precisely or with smaller relative deviations than the targets for wages. This is an empirical fact which can easily be verified by the data.

¹At the same time we refrain from getting too involved in a detailed description of the contemporary Hungarian situation. We are trying to draw conclusions of more general validity from Hungarian experience.

²Hungarian economic terminology, like that of other countries, makes a distinction between the wages of blue-collar employees and the salaries of white-collar employees. In the following the term "wages" will be used as a common term for the two kinds of income.

This is so not only because the planners' forecasts are particularly good in this field, though this, too, plays a part. *The government has effective instruments at its disposal to enforce the implementation of its central wages policy.* We do not discuss the question why the economic authorities wish to and are able to implement the targets related to wages more exactly than many other important indicators in the plan, such as investment expenditure. Here we state only the fact itself and draw attention to some of the instruments used to implement the wage plan.

“Wage money” and “nonwage money” are separated from each other. With some exaggeration it might be said that money is not fully convertible, even at home. The money a firm or a nonprofit institution intends to spend on wages, or does actually spend is “labelled” and clearly delimited from money spent or to be spent for other purposes. This is the case with every aspect of economic activity. It starts with *planning*: in the plans for the circulation of money the money to be paid as wages is a separate item; similarly, wages are separately treated among the costs of production and so forth. It is also true of *credits*, where credit granted for wages is sharply separated from any other kind of credit.³ Strict separation is enforced on every *actual spending decision*, at whatever level of management. The principle that “1 Forint = 1 Forint” does not apply. On each occasion the question is asked: “shall we spend this Forint on wages or on some other item?” And the separation ends with every form of *accounting*. Naturally, wages are handled separately in the accounts of firms and nonprofit institutions; credit granted for payment of wage is separately recorded by the banking system; and wages also receive special treatment in the official statistics.

This total separation is important in itself. It not only facilitates a clear presentation of facts, but makes every decision-maker consider whether or not his action directly contributes to increasing the purchasing power of the population. But, beyond this educational and disciplinary note, the separation serves the primary purpose of improving various administrative obstacles on the free conversion of the two kinds of money. In many cases the limits operating in *both* directions to prevent the money destined for wages from being spent on nonwage purposes and vice versa are not absolute. Mostly we have a “valve” which works in one direction only, to prevent nonwage money from being spent on wages. The forms of this prohibition are diverse; nor are they necessarily uniform in all sectors or

³At present also the *taxation* of firm's profits in Hungary sharply distinguishes profit used for investment from that used for personal income.

even over all time periods. In the period of traditional economic management the wage fund was prescribed in absolute terms, and was binding for every firm: it was prohibited to exceed a precisely specified amount under any title. While the aggregate budget constraint which limited total expenditure by the firm proved to be soft, the budget constraint on an important part of expenditure, wages, was hard, and effectively limited the freedom of action of the firm.

In the postreform system of economic management the wage fund is no longer prescribed in absolute terms, but wage payments are still restricted in several ways. Several funds may not be spent on wages, or may be used for wage payments only on definite conditions which are specified in detail. Thus, for example, each firm must accumulate a so-called "reserve fund". Although these funds are savings made by the firm, the manager is not entitled simply to distribute them among the workers in the form of wage rises. The state budget determines for the nonprofit institutions not only a limit for their total expenditure, but also what they can spend within that limit on wages. We shall not continue, since these few examples were meant only to illustrate how the conversion of nonwage money into wage-money is prevented by various administrative prohibitions.

The legal prohibitions are complemented by the *incentive* system. Bonuses paid to firm executives have always been closely linked, amongst other things, to the observance of wage-discipline; only the actual form of the link has changed several times in the course of time. Initially the bonus was conditional on observance of an absolute wage fund. Later various relative indicators have played a role such as the observance of an average wage per head, computed for the whole of the firm. There have also been bonus schemes which established a functional relationship between acceptable wage increases and the increase in labor productivity, and which discriminated against increases of wages not supported by productivity increases. Since the reform of economic management methods which try to assert wage-discipline mainly by indirect ways, through financial incentives have become increasingly prominent, for example by making progressive taxation of firms' profit a function of the rise in personal wage income. Again, we do not have space for a detailed description, but wish only to emphasize the most important common feature of such schemes. The forms of incentives mentioned and those similar to them all give managers a financial interest in economizing not simply on the Forint, but on the "wage Forint". This financial stimulus is complemented by many kinds of "moral" incentives. Every manager from the shop foreman to the minister, will certainly be called to account by his superior for his wage payments. If

he has exceeded the estimates he will be rebuked. Every manager feels that the observance of wage-discipline is a very important criterion whenever his work is evaluated and judged.

In the discussions preceding the reform this practice was often sharply criticized. The critics pointed out that this approach may easily lead to waste. The decision-maker is inclined to be careless with nonwage inputs if by doing so he can remain within the limits prescribed for wage expenditures. It is worth noting that *the same* phenomenon has been expressly acknowledged by quite a few Western observers of the socialist economy.⁴ Inflation is one of the gravest problems of contemporary capitalist economies. Although the various economic schools are divided as regards its explanation, at least some economists consider that the wage-price spiral, induced by the pressure for higher wages, is the main (or one of the main) explanatory factors. For those who reason along these lines, the approach and practice of the socialist economic leadership may serve as an example. They feel that there is justification for an approach which says that the "wage expenditure" is not identical with "nonwage expenditure" and that the former should be given *particular* attention at every level of management, from the smallest decision to the biggest one. Fear of wage inflation has become much more deeply ingrained in the everyday management routine of socialist firms than in that of present-day capitalist ones.

From the fact that the central authorities in a socialist economy have effective instruments for implementing their own policy, *it does not follow* that this policy may be an arbitrary one. They cannot make any decision whatever in the hope that it will be implemented. Although policy has a certain degree of freedom, it is limited. The remaining part of this chapter mainly discusses these limits. In particular we shall try to establish whether there are lasting regularities in the formation of wage policy. The "politician" is not the external manipulator of a machine who can push buttons and turn levers at will. *The "politician" is part of the system,⁵ who reacts with definite action to definite signals.* Are there any "rules of thumb" or decision routines in the formation of wage policy? What are the signals and feedbacks which serve as a starting-point for decisions?

⁴See, for example, the article by Wiles (1974). It is understandable that a *British* economist should appreciate this feature of socialist economic management, since this is a central problem of the British economy.

⁵In his paper Lindbeck (1976), using the language of mathematical model-builders, speaks of "endogenous politicians", and contrasts this with the standard principle of model-building which considers policy always as a factor exogenous to the system.

This last question is closely related with another set of problems. What is the *effect* of wages on employment and on the allocation of labor? This is the most important element of “feedback”. If a given wage policy results in an allocation of labor which is different from what the authorities wanted, then either allocation plans have to be modified or the wages policy, or both.

These two sets of problems – the rules of behavior in the determination of wages policy and the effect of wages on the allocation of labor – will be the main subjects discussed below. The second part of the chapter makes clear how these opening sections are related to shortage and “quantity” adjustment, the main subjects of our book.

16.2. Determination of short-term wages policy

An attempt will be made to describe the algorithm for determining short-term wages policy.⁶ The term “algorithm” is used because what we face here is not a single huge simultaneous decision, but a chain of partial decisions, whose sequence results partly from the logic of the relationships between them and partly from political and economic considerations; one choice can only be made after another problem has been resolved. Although we shall speak of an algorithm, we do not wish to give the impression that wages policy is determined in the socialist planning practice using formalized procedures and computers. The planners, of course, begin with numerical analyses, but then try to reconcile their forecasts and computations by personal discussions. Debates and bargaining entail repeated revisions of the initial computations. Our algorithm is an *abstract descriptive model*⁷ of this harmonizing process carried out by actual *human beings*.

⁶In developing section 16.2 I used the paper by Kovács (1975).

⁷The description is extremely sketchy: it indicates what happens in some of the steps by little more than the title. The majority of the formulae are definitional identities. Decision rules occur only at a few places.

One of the reasons for the sketchy character of the presentation is that some of the interrelations will be explained in detail later, in the chapters on household consumption, consumer prices, and money. The algorithm now reviewed is a comprehensive summary of the later discussions. Another reason is the limited space available. We are compelled to neglect several extremely important problems since they would take us far beyond the central subject of the book.

Planning is an *iterative* procedure. Below we shall describe a cycle consisting of seven steps, which may be repeated several times, in whole or in part, should some essential change occur in the parameters. If, for example, the planners have obtained fresh information, or if new viewpoints have emerged concerning the parameters which link the planning of wages to the other sections of the plan.

Step 1: total household consumption. The planner deals here in terms of *real* magnitudes; monetary aspects will be dealt with later on.⁸ A forecast for the level of household consumption is worked out together with the other basic indicators of the plan (production, investment, the real foreign trade balance, etc.). We cannot analyze this part of the planning process here, although it is of key importance. We only emphasize those interrelationships which from the consumption aspect restrict the range of plans acceptable to the highest authorities.

In planning real consumption in Hungary the following two *postulates* have been asserted in the last decade or two:⁹

$$\boxed{\begin{array}{l} \text{growth rate of} \\ \text{real consumption} \\ \text{per head} \end{array}} \cong \boxed{\begin{array}{l} \text{lower limit of tolerance} \\ \text{in the growth rate of} \\ \text{real consumption per head} \end{array}}, \quad (16.1)$$

$$\boxed{\begin{array}{l} \text{growth rate of} \\ \text{real consumption} \\ \text{per head} \end{array}} \cong \boxed{\begin{array}{l} \text{normal growth rate of} \\ \text{real consumption} \\ \text{per head} \end{array}}. \quad (16.2)$$

The magnitudes on the right-hand sides of the two formulae are parameters which are specific to the system; they may be bigger or smaller depending on concrete political and economic conditions. In the past 10–15 years many Hungarian planners felt that an annual increase in real consumption of 3–4 percent is “normal” and a 2 percent increase is “tolerable”.

We have used the word “postulate” since this seems to be a requirement or goal in the *consciousness* of economic policy-makers; it is an aspiration level. It is not a hard physical constraint we are faced with, but a behavioral constraint of economic policy-makers, which constraint may be transgressed by the particular decisions of a certain period. But it is much

⁸For the purposes of macro-level planning the real levels of production, consumption, and so on are calculated by aggregation at fixed prices.

⁹See, for example, Hoch (1977).

more than this. However the problem is formulated in the consciousness of the planner, what we have here is *an historically observable tendency actually in operation*. This is a hypothesis that can be empirically tested, and would be confirmed if the trend fitted to the time series data on per capita consumption is an increasing one, if the dispersion around the trend is not too big, and if growth is in almost all cases monotonic. According to our hypothesis the interrelations (16.1) and (16.2) operate as stochastic regularities. This is a basic achievement of the system. (Of course, the cases of stationary, or even decreasing, real consumption per head cannot be excluded from the theoretical possibilities of the analysis. Consideration of these cases, however, would lead to the study of decision mechanisms substantially different from those examined in this book.)

As with *normal* values discussed earlier, here too we may state that a norm means not only that a variable fluctuating over time has some time trend. We are justified in speaking about a “norm”, if there exists a *control mechanism* which pushes the system towards the norm, if it deviates from it. There exists such a mechanism covering increases in living standards, though an analysis of it would reach far beyond the scope of this book and would lead to the field of political sociology. Holding back increases in living standards, or their absolute reduction, and infringing the lower limit (16.1) sooner or later entails serious political and social consequences, tension, and even shocks,¹⁰ which after a shorter or longer lag force a correction. A deviation in the opposite direction conflicts with the hunger for investment and with the expansion drive (and perhaps causes difficulties in foreign trade and in payments). The idea that a country is living beyond its means usually leads to a slowing down in the growth of consumption, which has grown faster than the normal rate.

While postulates (16.1) and (16.2) are important, attention should be drawn to the fact that they are compatible with the following phenomena.

(a) The growth rate of *per capita* consumption is not regular; periods of deceleration and acceleration alternate.

(b) The increases are not evenly distributed among the various strata of the population.

(c) *While the level of per capita consumption increases, shortage may persist and even grow in intensity.* The growth of real consumption does not necessarily entail a growing intensity of shortage. There is no positive correlation between the two, nor is there a negative one for that matter. It is possible to consume more year by year—while the consumers continue

¹⁰This has already been discussed in connection with investment cycles in section 9.10. We emphasized there that there are minimum “tolerance limits” to increases in living standards.

to queue, to wait, and to make forced substitutions. These will be discussed in Chapter 18.

Step 2: total household consumption of commodities. From total household consumption those items should be deducted which the population does not purchase but receives as fringe benefits. In the next chapters this distinction will be treated in greater detail. Planned economies – adopting the terminology of Marxian political economy – call the consumption of goods purchased by households, consumption of commodities.

In this stage of planning a balance is drawn up of commodities to be sold to the population. Every item of the balance is an aggregate at constant prices:

$$\begin{array}{|l} \hline \text{terminal} \\ \text{volume of} \\ \text{stocks of} \\ \text{commodities} \\ \text{available} \\ \text{for house-} \\ \text{hold pur-} \\ \text{chase} \\ \hline \end{array} = \begin{array}{|l} \hline \text{initial} \\ \text{volume of} \\ \text{stocks of} \\ \text{commodities} \\ \text{available} \\ \text{for house-} \\ \text{hold pur-} \\ \text{chase} \\ \hline \end{array} + \begin{array}{|l} \hline \text{production} \\ \text{+ imports} \\ \text{- exports} \\ \text{of consumer} \\ \text{goods} \\ \hline \end{array} - \begin{array}{|l} \hline \text{volume of} \\ \text{commodities} \\ \text{sold to} \\ \text{households} \\ \hline \end{array} . \quad (16.3)$$

The figures for production, imports and exports are derived from the other sections of the plan. Should these targets undergo modification in the course of compiling the plan, the algorithm just described has to go through a new iteration.

There are fairly reliable forecasts on initial stocks at the time when the annual plan is compiled, but determining what terminal stocks should be causes problems. The size of stocks (and, of course, their composition) affects the supply of goods to the population. What was said in this context about the productive sphere in Chapters 5 and 8 also holds, *mutatis mutandis*, for household consumption. If stocks are reduced, there is an increased probability that queuing will be more frequent and longer, that waiting and searching will increase, that there will be more, and more painful, forced substitutions, and so on. But an increase in stocks on its own, without any improvement in their composition may make the planners worry that they are unnecessarily drawing resources away from other uses.

Step 3: nominal value of household commodity consumption. The consumer price index is easy to forecast if only because the expected price level is shaped to a considerable extent by the government price measures provided for in the plan. This price index now replaces the initial, fixed prices

used for aggregating the real variables:

$$\boxed{\begin{array}{l} \text{nominal value} \\ \text{of sales to} \\ \text{households} \end{array}} = \boxed{\begin{array}{l} \text{consumer price} \\ \text{index} \end{array}} \times \boxed{\begin{array}{l} \text{real volume} \\ \text{of sales} \\ \text{to households} \end{array}} \quad (16.4)$$

Step 4: cash balance of the household sector. First we describe the aggregate balance of the household sector as a whole, and later in step 5 how it is disaggregated among the different groups of the population. In practice aggregated and disaggregated forecasts are made more or less simultaneously:

$$\boxed{\begin{array}{l} \text{terminal} \\ \text{stock of} \\ \text{cash in} \\ \text{the} \\ \text{household} \\ \text{sector} \end{array}} = \boxed{\begin{array}{l} \text{initial} \\ \text{stock} \\ \text{of cash} \\ \text{in the} \\ \text{household} \\ \text{sector} \end{array}} + \boxed{\begin{array}{l} \text{money} \\ \text{incomes} \\ \text{of the} \\ \text{house-} \\ \text{holds} \end{array}} - \boxed{\begin{array}{l} \text{consumers'} \\ \text{expenditure} \\ \text{on goods} \\ \text{and services} \end{array}} - \boxed{\begin{array}{l} \text{other monetary} \\ \text{expenditure} \\ \text{of} \\ \text{households} \end{array}} \quad (16.5)$$

This is an extremely rough description of the balance. The stock of cash includes both the cash in the hands of households as well as bank deposits. Since the bank deposit of every household can be immediately withdrawn, it functions in practice as cash. The increase in the money stock of households, that is the monetary savings of households, will be discussed in Chapter 18.

Money incomes include any incomes received by households from firms and from nonprofit institutions.

The third item on the right-hand side of the balance, consumers' expenditure on goods and services, must be equal to the left-hand side of formula (16.4) which again is related to commodity balance (16.3). A methodological remark must be made here which has certain theoretical implications. In the planning process the value of consumers' expenditure on goods and services is derived from two sides, from the side of the *seller* in (16.3) and in (16.4) and from the side of the *buyer* in (16.5). Since the two values are derived from different preliminary computations, it is not certain that they will coincide at the first attempt. However, planners modify and improve their computations until they finally arrive at identical figures from both sides. They have to secure this equality, since this is an *identity*. Even if the plan were not exactly fulfilled, the identity holds; sales to households and purchases by households are obviously the same

event. This coordination in planning has nothing to do with whether demand and supply of consumer goods are equal. Even if the commodity purchases of the household sector are identical in the balances compiled from the sellers and from the buyers point of view, there may still be either shortage or slack in the market.

Step 5: the disaggregation of cash balances. The total household money income in (16.5) has to be disaggregated:

$$\begin{array}{|c|} \hline \text{total money} \\ \text{income of} \\ \text{households} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{total wages} \\ \text{paid for work} \\ \text{performed} \\ \text{in state} \\ \text{firms and} \\ \text{nonprofit} \\ \text{institutions} \\ \hline \end{array} + \begin{array}{|c|} \hline \text{other money} \\ \text{incomes of} \\ \text{the household} \\ \text{sector} \\ \hline \end{array} \quad (16.6)$$

Other money incomes include the money income paid by cooperatives, receipts of sales from household plots, the revenue of private artisans and private retailers, pensions, sick-pay, stipends, family allowance, maternity allowance, etc. Their amounts are partly predetermined by various legal regulations or by planned government measures, partly they develop as a function of production and circulation in the plan period. The incomes of agricultural workers, which are a function of production, are an example of the latter.

The disaggregation (16.6) requires not merely good forecasts of the individual items. The central economic authorities endeavor to enforce their *income distribution policy* in this breakdown. In the course of disaggregation (16.6) decisions are made on such issues as how money income should be distributed between those working in state, cooperative and private sectors, between workers in manufacturing and agriculture, between towns and villages, between those of working age and pensioners, and so forth.

Although it would be useful to follow the further stages of planning "other money incomes" in detail, in view of the limitation indicated at the start of this chapter, in the next two steps we shall trace only the first item of the right-hand side, i.e. wages.

Step 6: the committed and noncommitted parts of the wage fund. The planner weighs up how much expenditure firms and nonprofit institutions would incur on wages in the following circumstances.

(a) The level of output grows as planned, as does the productivity of labor.

(b) Changes in wages (usually increases) to which the political and economic leadership are already committed are implemented.

(c) Apart from the changes under (b), wage rates remain unchanged.

Accordingly, the wages to be paid by state firms and nonprofit institutions can be divided into two parts:

$$\begin{array}{|l} \hline \text{total wages} \\ \text{paid for work} \\ \text{performed in state} \\ \text{firms and nonprofit} \\ \text{institutions} \\ \hline \end{array} = \begin{array}{|l} \hline \text{committed} \\ \text{part of} \\ \text{wages} \\ \hline \end{array} + \begin{array}{|l} \hline \text{uncommitted} \\ \text{part of} \\ \text{wages} \\ \hline \end{array} \quad (16.7)$$

The first item on the right-hand side is “automatic”. True, it has been essentially influenced by political and economic considerations, particularly in step 1 in connection with the general increase of consumption, and in step 5, which is related to income distribution. But, when these earlier decisions are taken, the committed part of total wages is given. It is only the remainder, the uncommitted part, which the planner can “play” with and which he can use to change *relative* wages.¹¹ The uncommitted part is usually a small fraction of the total, therefore the possibilities for modifying relative wages are rather limited. The previously established relative wages are rather rigid if only on this account.

Step 7: relative wages. First of all a ratio must be determined. Its numerator is the item on the left-hand side of formula (16.7), that is total wages paid for work performed in state firms and nonprofit institutions. Its denominator is the number of employees in these sectors. The result will be the average annual nominal wage per employee. It is customary to analyze it on a monthly basis. Let us denote the average monthly nominal wage per employee in the sector comprising state firms and nonprofit institutions in the following period t , by $\omega(t)$.

The next step is disaggregation by occupation. Let us denote the monthly nominal wage per employee in occupation i by $\omega_i(t)$.¹² Henceforth, for the sake of brevity, the attributes “per employee” and

¹¹In planned economies the expression “wage policy” is frequently taken to mean only this stage, the shaping of *relative* wages.

¹²Of course the following trivial condition has to be satisfied:

$$\sum_i \omega_i(t) N_i(t) = \omega(t) \sum_i N_i(t), \quad (16.8)$$

where $N_i(t)$ is planned employment in occupation i , $\omega(t)$ is the level of monthly average nominal wages corresponding to the preceding steps of the algorithm.

“monthly” will be omitted, but when we speak of *average nominal wages* or those *by occupation*, we always mean the ω and ω_i as defined above.

In planning, particular attention is paid to the wages *ratios* among occupations, that is to *relative wages*. The factors shaping relative wages will be discussed in a later part of this chapter. Here only two constraints are reviewed. One is the political and social tolerance limit:

$$W_i(t) = \omega_i(t)/\omega_i(t-1) \geq 1, \quad \text{for every } i. \quad (16.9)$$

nominal wage index in occupation i
--

nominal wages in period t and $(t-1)$

It almost never occurs that nominal wages are reduced, even in occupations where a relative cut is planned. Indeed, wage policy tries to secure at least a slight increase in the nominal wage even for these occupations. Thus, in the constraint (16.9) the inequality holds in almost every occupation. This in itself reduces the possibility of transforming the inherited pattern of relative wages.

While wages are rigid *downwards*, prior commitments limit the possibilities of *upward* movements, as can be seen in step 6. Only the uncommitted part of total wages can be used for changing relative wages. This is the amount which the planners distribute among the various occupations.

Our survey of the algorithm suggests the following theoretical conclusion. Neither of the extreme views of wages seems to be verified. One extreme view would consider wages, the real consumption of households and the forecast level of “living standards” as the main starting point of planning, to be fixed at the outset by political decisions. Only what is left after that is available for all other uses. The other extreme concept would consider wages (or the real consumption of households) as a residual: what is left over after meeting the requirements of investments, productive consumption, consumption of nonprofit institutions and exports remains for the purposes of household consumption. Household consumption is the buffer compensating for fluctuations in the other items of use, particularly investment. That is to say, if investment soars, household consumption declines in relative terms, and vice versa.

It seems that neither extreme view is an accurate description of practice. As shown in the above seven steps, both real consumption and nominal wages have their *own movement* and their own life. Some of the variables

playing a role in their development have “normal values” and there exists a control mechanism which enforces the norm over time. There are effective lower and upper constraints. Therefore, neither real consumption nor nominal wages are buffers or residuals.

On the other hand, the other sectors competing with households for the use of resources, namely firms and nonprofit institutions, are also subject to a number of upper and lower constraints; there too, control by norm operates. Household consumption and nominal wages develop by a *mutual adjustment* of these real and financial processes.

Planners attempt to harmonize these processes in advance. We have seen that, although they have some room for maneuver, their hands are rather tied.

16.3. The effect of nominal and real wages on aggregate demand for and supply of labor

There is a complicated interaction between wages on the one hand and the demand for and supply of labor on the other. The following sections analyze this interaction. No doubt, there is a close relationship between *relative* wages and the *allocation* of labor among industries, occupations, and jobs. This will be examined in section 16.4. First, however, we are going to discuss interaction at the aggregate level. Answers are sought to the following questions.

What is the relationship in the sector comprising firms and nonprofit institutions¹³ between average nominal and average real wages on one hand, and between total (initial and revised) demand for and supply of labor on the other? We do not seek to provide an answer which is generally valid, but only one which holds for a socialist economy.

The relationship operates in one direction in the *real sphere*. Growth of production is accompanied by growth of employment, until it hits labor supply constraints. From then on expansion is accompanied by full employment and labor shortage.¹⁴ This growth of production allows real household consumption and, therefore, real wages to increase. This causal relationship is trivial and does not require further discussion here.

The relationship in the *control sphere* between wages and the demand for and supply of labor is less trivial. Before explaining our propositions, let us

¹³The propositions also hold for the case when nonprofit institutions are neglected and the macro-indicators are related to the firm sector alone.

¹⁴Henceforth our reasoning continues the line started in Chapter 11 and uses the concepts introduced there.

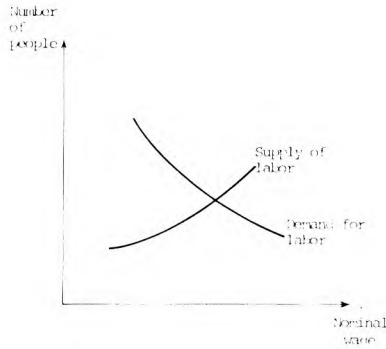


Figure 16.1. The orthodox model of the labor market.

glance at fig. 16.1. This is the orthodox diagram of the labor market, the standard Marshallian cross. The price level of consumer goods is assumed to be constant. Both aggregate demand and supply are measured in numbers of people. Demand is a decreasing function and supply an increasing function of “price”, in this case, wages. Wages and the demand for and supply of labor are interdependent at the macro-level and mutually determine one another.¹⁵ Several works on macroeconomics regard this model as a valid description of the real labor market in a capitalist economy. Although even this statement seems doubtful, analysis of it is not within the scope of this book. But we should like to take a stand as regards the socialist economy, especially as in the literature the idea has emerged that the model of fig. 16.1 also holds for the labor market of a socialist system.¹⁶ We shall attempt to refute this idea, since experience has shown that the aggregate labor market in a socialist economy cannot adequately be characterized by the Marshallian cross.

The well-known thesis that wages are “sticky” or “rigid downwards” modifies the orthodox model. It is not usual to reduce wages even if there is excess supply of labor on the market. This is certainly true, and it operates in wage planning in socialist economies too. (See constraint (16.9) in the algorithm.) Our argument, however, goes farther than this. We state that at the macro-level both aggregate demand for labor and aggregate supply of labor are more or less inelastic with respect to wage levels in a

¹⁵We remind readers that the three unknowns are linked by three relationships, a demand and supply function for labor and the equilibrium condition.

¹⁶See, for example, Barro–Grossman (1971) and Howard (1976).

socialist economy. These variables scarcely react at all to changes either in the average nominal wage level, or average real wages.

This hypothesis can be tested by *econometric studies*. On the one hand, we have time series data for nominal and real wages. Although these increase, their rate of growth is uneven. On the other hand, we have the time series data for employment. It rose—sometimes faster, sometimes more slowly—until labor reserves were completely absorbed. And when the average level of employment was stabilized, it continued to fluctuate somewhere around the average. It seems that there is no substantial correlation between the changes in the two time series, whether simultaneous or lagged relationships are examined. Fluctuations in employment do *not* depend on fluctuations in wages, but on other factors. (These conjectures require careful testing.)

However, beyond statistical checking at the macro-level, the most important thing is to go back to the *microeconomic* foundations, to regularities in the behavior of firms and households. Let us first look at the *demand side*. In Chapter 14 it was shown that for various reasons, but mainly because of the softness of the budget constraint, the socialist firm responds weakly to relative input prices. They have but little influence on its short- and long-term decisions. It may be that the administrative constraints on wage costs momentarily delimit labor demand. In the final account, however, firms and nonprofit institutions are subject to expansion drive which is not restrained at all by labor becoming more expensive.

We now consider the *supply side*. According to the orthodox theory this is determined by a choice between work and leisure. Let us briefly sum up the choice-theoretical background. Work has a “disutility” while leisure has a positive utility. The larger wage an individual receives, the more the utility of the goods bought with the wage compensates for the “disutility” of work and for the utility of leisure forgone.

First of all let me make a methodological remark. Whether the above reasoning correctly describes the choice of labor to be supplied *is not a problem of deductive logic, but an empirical problem*. And in my opinion if we seek to construct a descriptive model, we have to abandon the idea of describing different types of decision on labor supply by a *single* scheme.

There is a class of decisions which is not far removed from the model above. For example a worker already employed in the sector comprising firms and nonprofit institutions and working normal hours for normal wages may have to decide whether to undertake night shifts or extra work on Sundays. These are certainly disagreeable and shorten his leisure time—but he may be compensated for the losses if the extra work is well

paid. Therefore, if aggregate labor supply is measured in terms of man-hours instead of the total number of employees, the ratio of overtime rates to basic rates would play a substantial role, as *one* of the explanatory variables.

A related problem is that of deciding how much work an individual should do in the "informal sector", in the "second economy", in addition to work performed in the formal sector, for a firm or nonprofit institution. For example, how much work should he put in after official hours in his own private agricultural plot, how many services, industrial repair work, for example, should he perform for private individuals, etc? This obviously depends, among other things, on the level of nominal wages paid in the "first economy" and the earning possibilities provided by the "second economy". As was indicated in Chapter 1, the analysis of the "second economy" falls outside our scope and hence we do not discuss this important aspect of the labor market.

But there exist several other choice situations concerning labor supply which do *not* develop according to the above scheme of work versus leisure. If we now stick to our narrower subject, the labor market in a socialist economy, three kinds of *typical decision situations* may be observed.

(1) Most of the potential reserve labor had, in the period when this reserve was being absorbed, *practically no choice but to take a job* in the cooperative sector or in a state firm or nonprofit institution. Let us consider first the largest group; the peasants who had previously been individual farmers *had* to take a job after the change of ownership; otherwise they would not have had any livelihood. And since demand for labor was strong, they were employed. The possibility of choice was restricted to what actual jobs they should take. (This is the subject of the next section which deals with the allocation of labor and relative wages.) In short, the transition from the way of life of an individual farmer to that of a worker employed by a cooperative, a state firm, or a nonprofit institution took place *independently* of the current state of the nominal and real wage rates and of their growth rates.

The situation was similar with a considerable number of those who had earlier been artisans or retail dealers or their employees or had belonged to a strata formerly living on their wealth or property.

(2) The situation was different with *women*, who had previously worked only in the household, but later took jobs in the sector comprising firms, and nonprofit institutions. In contrast with the situation described under point (1), these women generally had a choice. They could decide not only

where they wanted to work, but also on the deeper, more fundamental question of whether they wished to take a job at all. Individual answers to this question usually develop under the combined impact of several factors. Repeating some of what was said in Chapter 11, we shall list some of these factors.

(a) The most important one is opportunity itself. A woman who would not have thought of looking for a job when even men could find one only with difficulty, is more inclined to take a job when demand for labor is high, particularly if this becomes noticeable. (If, for example, a new plant is started in the neighborhood.) Or if the *information* arrives in an impressive form (if, for example, she is personally asked to take some job etc.). *In this sphere demand creates its own supply.*

(b) The inclination of women to take a job increases if they receive institutional help in the care for their children during the day (kindergartens, day-time care in schools, etc.), if transportation linking the home with the job improves, and so on. One of the main explanatory variables in the supply of female labor is the easing of practical burdens resulting from duties outside the job.¹⁷

(c) It is a general truth, which may be particularly stressed here, that work not only has a disutility. It may be burdensome for many people much of the time. But it *also* has many attractions besides the wage. A woman taking a job in a firm or in a nonprofit institution may find the new job more challenging and more interesting than work in the home. She becomes acquainted with people, enters a community, and becomes more confident and independent. All this has been a commonplace for a hundred years and, as a private individual, every economist knows it quite well. The only trouble is that he leaves it out of the scheme of standard microeconomic theory when he constructs an explanation of labor supply based on the antithesis "work = disutility, leisure = utility". These permanent effects of female employment also contribute to the changes in the social environment. *New norms* will emerge; the woman hesitating to take a job is much influenced by the fact that in her environment it is now increasingly considered normal to work.

(d) Discussions of the family income are closely linked to the matter above. Let us consider a number of families acquainted with one another,

¹⁷It is a remarkable countervailing tendency that some mothers return for a long time or for good to the household. Factors are at play here similar to those mentioned under (b). For example, a woman feels that if she returned to her job she would not be able to care for her child.

The decision is also influenced by the size of maternity and family allowances. But this concerns *relative* wages.

in which the earnings of the husband are about equal (for example, all are skilled workers). In some of these families the wife is employed, in others she is not. Where she is employed, the family income is one and a half times or twice that of the other group. As the proportion of the first type grows, their incomes become the *aspiration level* of family income for the others. And later, when in the overwhelming majority of cases the wife is employed, this becomes the *normal* family income. And those who do not attain this income and the living standards accompanying it recognize that their incomes are lower than their aspirations, and even lower than the normal level, because the wife is not employed.

And here we identify the effect of wages. If the woman takes a job, this suddenly increases the income of the family by one and a half or two times. Whether the woman wants this sudden increase or not depends on all the considerations which have just been discussed. But if, weighing everything up she decides in favor of the increase, current nominal wages do not count for much in this particular decision. Nor does the increase in wages over the preceding year. The less so, since the *expectation* is justified that both real and nominal wages will grow regular in the future.

(3) All those who are *used to employment*, including after a time those discussed in points (1) and (2), offer their labor supply on the market at *any wage rate*. This was explained in detail in Chapter 11 and needs no separate justification here.

Let us sum up the common element in points (1)–(3). We have analyzed *the microeconomic foundations of the macro-model* and have established that in a socialist economy the aggregate supply of labor at the macro-level *cannot* be considered a function of the nominal and real wage either in the short run or in the long run.

This conclusion has been the last link in a longer chain of reasoning, which it is worthwhile to summarize.

*Aggregate demand for labor, aggregate supply of labor, and aggregate employment (each of them measured in numbers of people) are “quantity” processes which adjust to each other and to other nonprice signals and incentives.*¹⁸

¹⁸Our statement above concerning *employment* (in terms of number of people) and the *short and long-term* adjustment processes is compatible with the following statement regarding *working time* (in terms of hours) and the *instantaneous* adjustment process.

The total instantaneous supply of hours (including the overtime worked in firms or in nonprofit institutions as well as the time spent in the “second economy”) depends on the relation between the nominal wage paid by firms and nonprofit institutions for work during regular hours and the earnings obtainable by overtime and by working in the “second economy”. These are complementary or secondary explanatory variables, while the macro-

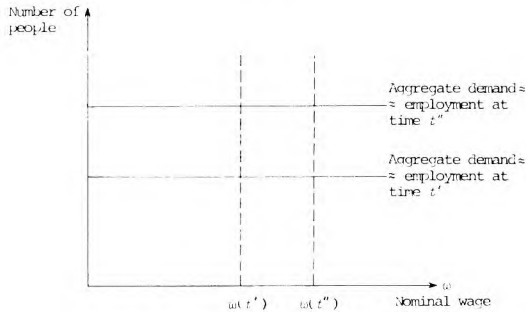


Figure 16.2. Aggregate demand for labor and the nominal wage in the extensive period of growth of a socialist economy.

Relying on our analysis, we set against the orthodox fig. 16.1 two other figures which, in our opinion, more accurately reflect the operation of the aggregate labor market in a socialist economy. Fig. 16.2 holds for the transitional period of extensive growth beginning at time t_0 and ending with t_2 (see section 11.7), in which absorption of the potential labor reserve takes place. The horizontal lines designate the aggregate short-term demand functions, at various dates: $t_0 < t' < t'' < t_2$. The demand function shifts upwards over time. But it is horizontal at every moment and does not depend on the nominal wage. The demand constraint is effective and this determines employment. In the meantime both nominal and real wages increase over time.

Figure 16.3 illustrates the period of intensive growth: $t_2 < t''' < t''''$. The potential reserve of labor has been absorbed. From then on the more or less constant supply constraint (represented by a horizontal line) is effective and determines aggregate employment, measured in numbers of people. Demand for labor may be measured by several indicators. The short-term initial demand or the demand revised after forced substitution may be observed. Any of these exceeds supply. While the average levels of labor supply and employment are rather stable over time,¹⁹ nominal and real wages are rising over time.

supply of *hours* is determined principally by the same “quantity” signals and incentives which explain the macro-supply of labor in terms of number of workers.

The problem was indicated when we discussed the dilemma “work *versus* leisure time” at the start of the argument.

¹⁹For the sake of simplicity, the above figure has been drawn on the assumption that population of working age is unchanged over time. With a growing able-bodied population the same ideas would have to be explained using relative variables or ratios. This would not change the exposition significantly.

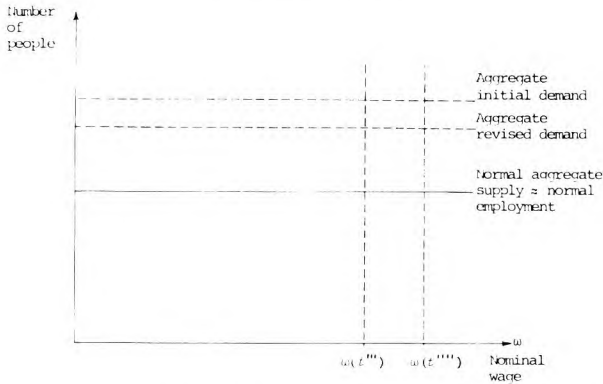


Figure 16.3. Aggregate demand for labor, supply of labor, and the nominal wage in the intensive period of growth of a socialist economy.

Up to now we have challenged the validity of the Marshallian cross under socialist economic conditions only in terms of the first causal relationship by which nominal wages determine aggregate demand for and supply of labor. Our critique of the other direction of causality in the orthodox theory, by which aggregate demand for and supply of labor determine nominal wages, will be postponed until the end of this chapter.

16.4. The effect of relative wages on the allocation of labor

Having reviewed in the preceding section the effect of the economy-wide average nominal and real wages on the aggregate demand for and supply of labor, we now pass to an examination of *relative wages*.

(1) *The impact of relative wages on the demand for labor.* We can briefly summarize this effect, by reminding the reader of what was said in Chapters 13 and 14 when analyzing the behavior of the firm. It was shown there that the budget constraint of the socialist firm is rather soft. Mainly for this reason, but also because of the priority of other (nonprice-dependent) choice criteria, although the firm is not quite indifferent to the relative prices of inputs, it is not particularly responsive to them. This statement also holds for relative wages.

In the course of instantaneous and short-term adjustments, production managers are ready if the necessity arises to make forced substitution: they temporarily substitute more expensive labor for cheaper labor. In long-

term adjustment, particularly in choice of technology, they give relative wages little weight. Other considerations, for example technological preference or direct signals of shortage, have a greater influence on the choice.

In fig. 16.3 the demand function of labor *at the macro-level* was illustrated by horizontal lines indicating that demand was inelastic. This, holds also for the *micro-level* if not perfectly, then approximately. *As long as it is compatible with wage discipline, the firm's demand for labor hardly responds at all to relative wages.*

(2) *The effect of relative wages on the supply of labor.* Here the effect is very strong.²⁰ *As opposed to the budget constraint of the firm, which is rather soft, that of the household is hard.* True, it gets some benefits free of charge and these are not negligible. (They will be treated in the next chapter.) But the bulk of products and services consumed by the household has to be bought for money. The household is not quite left to itself. In the case of difficulties of definite type, for example illness or natural disaster, the state provides help. *But under normal circumstances the material welfare of the household depends primarily on its money income.*

The hardness of the budget constraint explains why the household *has* to respond to relative wages. The latter strongly influence the individual in his *long-term choice of an occupation or profession*. The decision is also influenced, of course, by several other factors such as individual inclinations, talent manifesting itself at school, the social prestige of various occupations, "fashion", imitation, and so on. The choice is to a certain extent limited, particularly by whether the individual can enter the educational institution which would prepare him for a profession. However, besides all these considerations relative wages in the recent past and the present exert a considerable attracting or repelling effect. Most individuals are inclined to base their expectations on experience in the recent past and the present. The close relationship between the popularity or unpopularity of some careers and their relative wages can be empirically proven.

The *short-term* decision is *the choice of the actual job*. The chronic and intensive shortage of labor enables the worker to select from among jobs available and not to be satisfied with the first opportunity. Thus, *the labor shortage increases the influence of relative wages on the choice of a job*. Frequently even a marginal increase in wages induces a change.

A comparison of the demand for and supply of labor will show remarkable analogy with the demand and supply described in section 14.7. There the relations between firms were treated and an *asymmetry* was observed:

²⁰See, for example, Falus-Szikra (1978).

the firm as *buyer* is less responsive to relative prices, than the firm as *seller*. *On a sellers' market it is mainly the seller who responds to price.* A similar asymmetry may be observed on the labor market. The firm as “buyer” is not very responsive to relative wages, whereas the worker as “seller” is highly responsive to them. And this is so because in a resource-constrained economy the labor market is a sellers' market too.

(3) *The allocation of labor.*²¹ The allocation of labor among industries, firms, nonprofit institutions, professions, and regions is one of the few spheres in a socialist economy where the impact of “price-type signals” and the incentives linked to them is *relatively strong* (at least on the supply side). But other factors besides relative wages have a great impact on labor allocation. Without claiming completeness, we shall list a few other processes.

(a) Even if there is a sellers' market, labor can only be allocated in the final analysis to jobs which have been created in the sector comprising firms and nonprofit institutions. The whole preceding part of this book has tried to show in detail that the actual structure of the sectors—their fixed capital, their input–output combinations, their instantaneous output plans—develops in the framework of adjustment processes in which prices and wages play a small role.

(b) Attempts are made to adjust plans for education to expected demand for labor by the firms and nonprofit institutions. The capacity of the educational system limits from the outset the number of individuals seeking to enter particular professions and occupations.

(c) The individual's decision is strongly influenced on the supply side by nonwage signals and incentives. The long-term decision is affected, as has been mentioned, by the social prestige of the profession, and by other “nonmaterial” considerations; the short-term decision by the “climate” of the working place, working conditions, the personality of the superiors, and so on.

(d) Though it is related to the former point, because of its extreme importance we make separate mention of the close relationship between the choice of working place and housing conditions. An individual will

²¹The allocation of labor and the operation of the labor market—including many of the phenomena described in Chapters 11 and 16—could be modelled formally as in sections 7.1–7.4, and Mathematical Appendix A. There is no space to demonstrate this here.

There are several related models in the literature. For example so-called “search” models have been used to analyze the behavior of workers looking for jobs. See the references in section 4.3.

perhaps prefer a firm offering lower *money wages* to one paying higher wages if he expects more help from the former in solving his housing problem, for example by giving him a tied house or helping him to build his own home with a long-term loan, and so forth. And once he has taken a job, housing circumstances may again influence him in deciding whether to change jobs. It is difficult for him to move into another village or town if he cannot obtain a house there, however attractive wages may be. He may be tied to his present job precisely by the help which his employer gave him in obtaining a house. By leaving he would lose his tied house, or would have to repay the long-term loan immediately. Chronic shortage of flats reduces the mobility of the labor force and the role of relative wages in the allocation of labor.

(e) To an extent which differs from country to country and period to period, administrative allocation almost always operates to some extent everywhere, or at least some administrative controls interfere with the market allocation. The forms may be of many kinds: obligatory employment quotas for firms broken down by occupation; compulsory registration at a labor exchange when changing jobs; central allocation of labor in some branches; compulsory movement of individuals from one job to another; administrative restrictions on changing jobs, and so on.

It seems that the combined impact of the above factors, and of others not treated here, on the allocation of labor is no less strong than that of the relative wages. This is a statement the validity of which requires empirical verification.

The reader might ask whether there is a contradiction between sections 16.3 and 16.4. The former denied the effect of nominal and real wages, while the latter, if to a limited extent, acknowledged the influence of relative wages on the demand for and the supply of labor as well as on employment. In our view there is no contradiction. These statements are compatible. This is not only because section 16.3 discussed *aggregate* variables and 16.4 *disaggregated* ones; and because the former analyzed demand for and supply of employment of labor on the *macro*-level, while the latter investigated the detailed allocation at the *micro*-level. The main difference is that the two sections discussed *different decision problems*.

We will illustrate this only on the supply side. The individual's labor supply decision is not a single huge set of simultaneous decisions, but is divided into several different choice problems. The *first* decision is whether to take a job in the sector comprising firms and nonprofit institutions at all. Some individuals have no real choice in this respect, while others have.

If this issue is resolved, the *second* question is what occupation to choose, and then the *third* one is what actual job to take.²² Section 16.3 treated only the first decision and stated that it is not responsive to wages. Section 16.4 discussed the second and third decisions and established that they are responsive to wage levels.

16.5. Wage tension and wage-drift

Next we turn to the “feedback”, or causal linkage operating in the opposite direction. How are wages affected by the relationship between the demand for and supply of labor or by the state of the labor market?

It should be obvious that—irrespective of the social system—workers everywhere would always like to get the greatest possible amount of money for the work they perform. To this extent everyone is always “dissatisfied” with his wages. This may be complemented by two particular kinds of dissatisfaction. One is related to the *dynamics of real wages*. Demands for increases in nominal wages are more insistent if the consumer price level is rising, particularly if inflation is accelerating. This is so well known a phenomenon that we need not make a more detailed analysis. Another special dissatisfaction arises if some group, for example all workers in the same occupation within a firm or on national level, or perhaps all the workers in a whole industry, feel that they are receiving *disproportionately* lower wages. “Proportionality” or “disproportionality” becomes obvious for the group which bases its dissatisfaction usually on a comparison with one or more *reference groups*. If, for example, a secondary school teacher compares his own salary with that of an engineer, he reasons that he, too, had to spend about as many years at university and that his work is no less responsible and important, and asks why his wage is much lower. In such cases within the Hungarian planned economy the term *wage tension* is used. This occurs if some group is dissatisfied with its own place on the scale of relative wages.

We do not consider it our task to clarify when such relative dissatisfaction is justified or unjustified, either by economic or by ethical criteria. We merely state that *relative wage tensions do exist and are continually maintained*. Their intensity is not evenly distributed among those employed.

²²There may of course be a moment in an individual’s life when either two or all three of the decision problems arise simultaneously. For example, a young married woman who has completed secondary education may decide whether to stay at home or to take a job. And if she decides the latter, she must simultaneously decide on the actual occupation and perhaps on the actual job as well.

The intensity of wage tension, like certain other phenomena treated in the book, cannot be directly measured. But it may be described indirectly by observing and measuring its *consequences*.

The most important consequence of wage tension is migration which demonstrates the growing unpopularity of an occupation in the long run, and of a working place in the short run. In addition, because of wage tension complaints and objections also become frequent. Thus, in Hirschman's classification both kinds of feedback appear simultaneously, "exit" and "voice".²³

Wage tension increases the intensity of labor shortage through migration, with its labor repelling effect. This again reacts on the wage tension itself. The position of those who remain often gets more difficult since they have to do some of the work of those who have left. And precisely their awareness of their own perseverance and fidelity supports the feeling that the wages are disproportionate and unjust.

Let us recall the seventh and last step of the wage planning algorithm described in section 16.2, where relative wages are determined. The lower limit mentioned there ensures that nominal wages cannot be reduced in any occupation. The upper limit is set by the fact that only the noncommitted part of total wages can be used for the correction of relative wages. Between these two limits the main rule of behavior in determining relative wages is that first of all *they must ease wage tensions*. This law operates mainly in central wage planning, but similar effects can also be found on the medium and lower management levels as well. Any organization with an allocation of the noncommitted wages fund uses it first of all to diminish wage tensions.

The phenomenon described above is in many respects similar to what was called *postponement* in Chapter 10, which discussed investment, and to what was later called the realization of the postponed action. As in the case of investment, partial wage rises which are long overdue are postponed. At any moment there are accumulated wage tensions in every section. Just as a great part of investment resources are pre-empted by activities already in process, and by new investments already promised, and the noncommitted part is relatively small, here too, a considerable part of the total wage fund

²³In a shortage economy the individual, as *buyer* of consumer goods, cannot afford the luxury of either "exit" or "voice". If he takes offence and leaves the store where he has been served badly, or if he argues with the seller he may damage himself, since elsewhere he may be served even worse and the supply may be even smaller. But the same individual at his working place, as "*seller* of labor power" can use either the "exit" or the "voice" weapon in most cases with a smaller risk. He dares to quarrel with his superior precisely because he knows that the possibility of "exit" is open to him, as he will find a job elsewhere.

is pre-empted by automatic wage rises and earlier promises. What is left is too small to eliminate all the wage tension which has accumulated; some corrections will be postponed. And not only is it too small to eliminate the disproportions carried over from the *past*, it is also too small to forestall the disproportions which can be expected to emerge in the future.

The correction is frequently made by "leap-frogging". Group 1 adopts group 2 as a reference group behind which its wages are lagging. This is sooner or later corrected, or even over-corrected by group 1 leap-frogging group 2. And thus a new wage tension is created: now group 2 will feel that its wages are disproportionate to those of group 1 – and so forth.

It is not that the workers immediately affected either fight by themselves or are represented by the trade unions in their battle for the correction of wage tensions *against* the managers. The latter also fight for the correction of relative wages at all levels. The foreman wishes to remedy grievances on the shop floor, the firm's manager to remedy those of the firm, and the minister or his deputy wants to remedy those of the whole industry. All of them feel the wage tension directly. It is they who receive the complaints, and the migration of labor causes them difficulties in discharging their responsibilities.

In pure classical capitalism there was a clear division of roles between the capitalist owner and the trade union official in the struggle for wages. The latter strives to raise nominal wages as a representative of the workers, while the former resists this effort. The management from foreman to general manager identify with the interests of the capitalist owner and put up strong resistance to efforts to increase wages.²⁴ As opposed to that, *in a socialist economy the management in firms and nonprofit institutions, as well as the lower and medium-level officials in state agencies, act in wage negotiations with superior authorities as trade union officials and not as employers.* There may arise conflicts between superiors and subordinates over a number of questions. But they are in agreement that every manager tries to wring higher wages for his shop, section, etc. from his superior.

There are several explanations for this phenomenon. It is usual to refer to the fact that many managers in the early years of the socialist system had formerly been trade union officials, or at least their activity in the

²⁴In modern capitalism the situation is by no means so unequivocal. On one hand, the employer's resistance to raising the nominal wage is not very strong, because he feels he can pass the higher costs onto buyers through higher prices. This is partly a consequence of the inflationary expectations, and at the same time a cause of inflation as well. It is related to the fact that signs of the softening of the budget constraint can be seen in modern capitalism. On the other hand, depending on the actual political situation, the trade unions may restrain their efforts at raising nominal wages, because they believe its effects on inflation, and hence on real wages would be detrimental. A detailed analysis of modern capitalism is not our task. We have recalled the era of "pure" capitalism only to make the role of a socialist economic manager clearer.

labor movement had developed a predisposition to demand “higher wages for the workers”. There is certainly some truth in this observation, though the phenomenon is certainly not restricted to leaders with experience in the labor movement.

Others look for an explanation in poor personal qualities of the management—their softness, or their search for popularity. There may be some truth in this, too. But it should be added that a manager justly feels that popularity helps him in fulfilling his tasks. He may more easily prompt his subordinates to maintain discipline, to be more industrious, and to undertake difficult tasks, if they like him. And, indeed, his popularity depends first of all on the extent to which he represents the immediate interests of his subordinates, particularly in respect of wages. It is not just for reason of style that we used the term “representation of interests”. It characterizes an essential feature of the situation. *Workers certainly expect their superior to represent their interests*; whether he fulfills *this* function well or badly is an important criterion in their judgement of him.

The behavior of the manager follows not from his good or bad qualities, but from his *position*. The manager feels he is primarily responsible for solving the problems of the *part* of the system entrusted to him. He feels responsible not for the whole economy, but for a clearly specified part of it, and identifies himself with the latter. These partial problems are more easily solved if tensions are alleviated in his sector. So, everything *encourages* him to advocate this policy. At the same time—considering the interests of the firm or nonprofit institution—nothing *discourages* him. The consequences in terms of costs of raising nominal wage rates can be passed on.

Of course, a lower or middle level manager knows quite clearly that it would be impossible always to raise wages everywhere. Therefore, he approves wage restraint *elsewhere*. But he is convinced, in his own conscience, that a wage rise is justified *in his sector*. And the more he identifies with his own sector, the stronger this conviction becomes.

Lower and middle level managers might be restrained from always putting forward high wage demands by two factors. One is the soundness of their economic insight, the realization that the national wage fund (and the supply of consumer goods behind it) is limited. Self-restraint dictated by the feeling of responsibility is complemented or supported by tactical considerations. Excessive claims produce increased resistance and he may be gravely reproached. Cautious demands will not be resented, even if they cannot be satisfied for the time being.

The other restraining force is fear of leap-frogging. Every wage rise is directed to, and improves, the relative position of some group or occupation. Too great a leap produces new tensions.

Even if there are factors encouraging self-restraint, the basic tendency is still pressure from below to raise wages or *wage-drift*. This is natural behavior for the workers affected, the trade unions *and* lower and middle level management in the circumstances of chronic labor shortage, as discussed in detail in Chapter 11.

The reader may have noticed that our reasoning is similar to that advanced previously. Indeed, related phenomena were described in Chapter 9 in respect of *investment*. There we notice an insatiable hunger for investment. Every lower and middle level manager believed that investment in his own sector was entirely justified. Now we see the almost-insatiable demand for raising nominal wages. Every lower and middle level manager feels that wage corrections in his own section are entirely justified.

In the final analysis what we observe here is an almost-insatiable hunger for the two main components of aggregate demand, investment and consumption. And as regards the latter, this is shown not only by employees, but also by the employers, the lower and middle level managers of firms and nonprofit institutions. As regards the economy as a whole, the two kinds of hunger are obviously in contradiction. The more a country invests, the less remains, other things being equal, for household consumption, and conversely. The physical limits on resources in the system prevent the two kinds of aggregate demand from being satisfied simultaneously. But this conflict between the two main uses of resources is only experienced *internally* by the highest political and economic leadership. In setting the main macroeconomic targets of the central plan there is no escape from the problem that the more is allocated to investment, the less remains for consumption in a resource-constrained economy. But everyone else in the economic system *below* the highest level, that is everyone making partial decisions, feels that his section could get *both* more investment *and* higher wages – provided another section gets less of each. For him, therefore, this dilemma is *external*. He knows that there is a choice between investment and consumption, but he personally need not make that choice.

Under such circumstances it is only the highest economic policy-makers who are prompted by their actual situation and social role to resist wage-drift, just as only they are prompted to resist the hunger for investment. Everyone else is only willing to resist if he is compelled to by instructions and prohibitions or under a financial and moral incentive to do so.

Important conclusions both for economic theory and for economic policy follow from what has been said. An analysis of them would go far beyond the subject of our book, so we will draw attention to a single

implication, namely that *wage-drift is a built-in inflationary factor in a socialist economy*. The tendency is particularly powerful because lower and middle level economic managers, insofar as they are not bound by wage discipline, do not resist wage-drift, but support it. The softer the budget constraint in firms and nonprofit institutions, the more this is so. The tendency to wage-drift is not the only built-in inflationary factor (others have already been treated in earlier chapters) but it is at any rate one of the most important factors. Therefore, stability of the price level depends to a great extent on (1) whether, when central wages policy *is drawn up*, resistance to wage drift is strong enough and, if it is, (2) whether the central authorities are capable of *enforcing* the wage policy and the observance of wage discipline.

Instructions to maintain wage discipline and the related system of financial and moral incentives so to speak internalize the problems of choice for the lower and middle level managers. True, this internalization comes about for *administrative*, and not *economic* reasons, as a result of measures from above such as directives, prohibitions, bonuses, etc.²⁵ But once it has come about, a lower or middle level manager has to face the same. Shall he accede to the pressure *from below* pushing wages upwards, or to the pressure *from above* which tries to keep the increase in nominal wages within bounds? Usually he behaves in two separate ways (and this, again, is similar to his behavior in the case of investments): with subordinates he is restrictive, with superiors he is demanding. With subordinates he tries to observe the wage discipline, and at the same time tries to get more wages for his sector from his superiors. It depends on the system of economic management, on the detailed form of wage control, how the “bargain” between the micro-organization (firm or nonprofit institution) and the superior authorities is struck—in terms of the absolute wage fund on the average wage or government taxes and benefits related to wages, or something else. The result is the same; the manager would like to pay higher wages in his firm or nonprofit institution.

As a result of wage-drift and the resistance to it, the following situation generally develops.

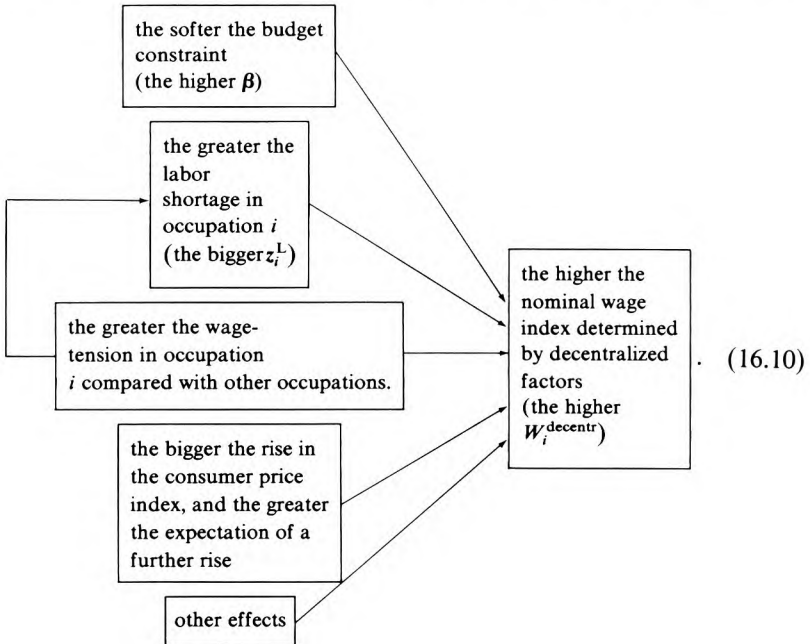
It happens, though not often, and not much, that *after* the adoption of the economy-wide plan for wages the targets are still transgressed. But it is more important for the subordinate to exert pressure *before* the wage plan

²⁵We mentioned earlier in Chapter 9 that the postreform system of economic management in Hungary attempts partly to “internalize” the dilemma by incentives linked to profit. The firm disposes of the part of profit left with it—at least within a framework determined by the rules. It may decide whether to use it for development of the firm or for raising personal incomes. Thus, the dilemma of “investment versus consumption” appears here, if on a smaller scale.

and the central wage policy become established, and to try to talk his superior into easing wage tensions, by raising nominal wages. The frequency and intensity of these phenomena differ from country to country and from period to period.

16.6. The compromise between the forces encouraging wage-drift and those resisting it

Let us sum up what has been said about the tendency towards wage-drift in a form which brings into relief the parallel with price-drift which was discussed in the previous chapter. We assume that the index of nominal wages actually realized is the weighted mean of two kinds of hypothetical magnitudes – *an index of nominal wages determined by decentralized factors, and an index determined by centralized factors*. The first will be denoted, for occupation i in year t , by $W_i^{\text{decentr}}(t)$. It is based on the assumption that nominal wages have been determined exclusively by agreement between the workers and the local managers of the firm or nonprofit institution. The latter may be influenced by government tax and credit policies, but their behavior in respect of wages is not restricted by administrative prescriptions. The decentralized factors are summed up in the following:



Formula (16.10) describes in verbal form *a wage-drift function*. Since, however, we know only the direction of causality, and do not know enough about the quantitative nature of the relationship, we cannot formulate the function exactly.

The first of the explanatory variables is the softness of the budget constraint. If the constraint were hard, strong decentralized resistance to wage increases would emerge. *The softer the budget constraint, the more the inflationary impact of increased nominal wages can be shifted onto the state or onto the buyer in the form of higher prices, and the weaker decentralized resistance to wage rises will be.*²⁶

The effect of the next two explanatory variables, labor shortage and wage tension, should be obvious. The two are also interrelated since wage tension may also exacerbate a labor shortage. (This is symbolized by the arrow on the left of the diagram.) Shortages of inputs (including labor) are maintained continuously by interrelations discussed in many places in this book. Managers of firms and nonprofit institutions think that labor shortage in their own units could be alleviated by raising wages, because this would attract people. (And this might be true, but it would draw away staff from elsewhere and thus the shortage of labor would only change places.) Therefore the *causal relationship linking labor shortage, wage-tension, and wage-drift inevitably operates in a resource-constrained economy*.

The fourth explanatory variable symbolizes a well-known interrelation. A rise in the consumer price level strengthens the efforts to raise nominal wages. This is what in a capitalist economy leads to the wage-price spiral. Because consumer goods become more expensive, workers demand ever higher nominal wages; if nominal wages rise faster than productivity, the unit costs of production go up and this leads sooner or later to rising prices. In a socialist economy the spiral may be broken by state intervention. A rising level of interfirm prices does not automatically entail a rise in the level of consumer prices. We revert to this problem in Chapter 19 when we discuss consumer prices. We only stress here that consumer price increases strengthen decentralized attempts to raise nominal wages.

The list of explanatory variables does not aim at completeness. The field labelled "other effects" indicates that additional factors operate.

The "dependent variable" $W_i^{\text{decentr}}(t)$ is a hypothetical magnitude and cannot therefore be directly measured. It symbolizes a *tendency* which cannot operate fully. But we can draw indirect conclusions concerning its size. In the wage negotiations at different levels wage demands are voiced

²⁶It seems that our statement may be also extended to the modern capitalist system. I merely wish to suggest the idea here. An examination of the development of wages under modern capitalist conditions would go beyond the scope of this book.

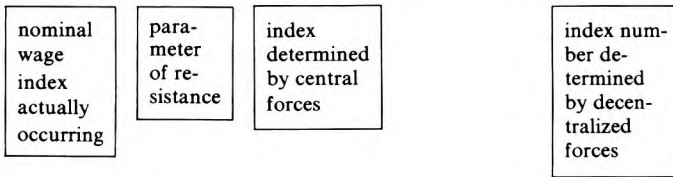
from below, and the tendency towards wage-drift may even be reflected numerically in these.

Let us now turn to the centralized effect. Let us denote the increase in nominal wages in period t in occupation i in the short-term plan by $W_i^{\text{centr}}(t)$.²⁷ This expresses the level of aspiration in central wages policy. How it evolves was described in detail in section 16.2, a decision algorithm of seven steps.

The question remains of how far the central economic authorities resisted or gave way to decentralized tendencies for wage-drift coming from below when the plan was completed. Such *ex ante* resistance or concessions could be estimated by comparing the values of W_i^{centr} and W_i^{decentr} .

Let us assume that the central wage policy provides for a much lower rise in nominal wages than would occur under the impact of decentralized forces alone. The index number of nominal wages which *actually* occurs may be described as follows:²⁸

$$W_i(t) = \rho_i^{(W)}(t) \cdot W_i^{\text{centr}}(t) + (1 - \rho_i^{(W)}(t)) W_i^{\text{decentr}}(t). \quad (16.11)$$



W_i without a superscript is a directly observable *ex post* magnitude, while those distinguished by “centr” and “decentr” are *ex ante* ones. The parameter $\rho_i^{(W)}(t)$ expresses management resistance to wage-drift in the course of implementing the wage plan. If $\rho_i^{(W)}(t)=1$, the plan is implemented 100 percent. If $\rho_i^{(W)}(t)=0$, the decentralized forces break through unhindered. In reality neither of these extreme cases occurs. The value of the parameter and the extent of government resistance is not necessarily uniform in every occupation. There are sectors, occupations and professions where pressure is easy to resist, while it is more difficult to do so in others.

The value of the resistance parameter $\rho_i^{(W)}(t)$ is an important characteristic of the system. In a socialist economy its value is fairly near to 1. Here

²⁷If the economy-wide plan happens not to contain a separate concrete target for occupation i , the W_i^{centr} corresponding to the general wage policy expressed in the plan could still be established.

²⁸Formula (16.11) is analogous to formula (15.1) which describes resistance to price-drift.

we express symbolically in formula (16.11) what we expressed verbally in section 16.1. The central economic leadership is capable of enforcing its wages policy effectively.

It is worth while reverting for a minute to the question asked but left unanswered at the end of section 16.3. We challenged the simplified model of the labor market which describes the relationship between the demand for and supply of labor and wages with the aid of the Marshallian cross. In section 16.3 we discussed one direction of the causal chain by which wages determine the demand for and supply of labor. Now we are ready to discuss the other relation by which demand for and supply of labor determine wages. We believe that the relationship between the demand for and the supply of labor indeed has an important influence on wages—as one explanatory variable. The true causal mechanism is much more complex. On one hand, as we made clear with the algorithm in section 16.2 the formulation of central wage policy is a complex decision process consisting of many steps and embodying several interrelations. On the other hand, we illustrated in diagram (16.10) the decentralized tendency towards wage-drift brought into being by the rules of behavior of individuals in the economic system and the managers of firms and nonprofit institutions, as well as by the social relations between them. The actual level of nominal wages is a compromise between the two main types of effects, as symbolized by formula (16.11).

In conclusion we may draw from this another general lesson concerning *shortage*, which is one of the main subjects of our book. Wage policy affects shortage phenomena at the detailed level. Reduction of wage tensions in a given sector may stop the migration of labor from that sector, and may even attract labor to it. Also, a system of relative wages can be conceived of which distributes shortages more evenly among the different industries, occupations, firms and regions. Such a policy would reduce unemployment on the job, that is the nonmobilizable internal labor slack. All this is most important. *But there is no wages policy which can eliminate a chronic shortage of labor once the social conditions have come into being which continually maintain that shortage.*

The allocation of goods and services between households

17.1. Introduction

There is a two-way linkage between the sector comprising firms and nonprofit institutions on the one hand, and the household sector on the other. First households “sell” labor power to firms and nonprofit institutions and get wages for it. This was the subject of Chapter 11 on employment and Chapter 16 on wages. Secondly firms and nonprofit institutions produce goods and services for households to consume. Households either pay the retail price for these consumer goods and services or they get them free of charge. This second linkage is dealt with in this chapter and Chapter 18.

The subject is divided between the two chapters as follows. The present chapter discusses *the allocative mechanisms* by which goods and services flow from firms and nonprofit institutions to households. The next chapter describes the end point of the flow: it will discuss *the behavior of the household* and the rules governing household consumption and saving.

Although the theoretical and methodological ideas of Chapter 17 are set out as apply to goods flowing from firms and nonprofit institutions to the household sector, some of them also apply to flows of goods between firms and nonprofit institutions.¹ But we can only draw attention to this potential application here since there is no space for a detailed account.

Two preliminary terminological remarks must be made. For the sake of brevity the term “goods” is often used in the present chapter to mean both consumer goods and services used by households. The terms “household” and “consumer” are used interchangeably.

¹Chapters 4–8 and 14 on the behavior of firms should be complemented by Chapter 17.

17.2. Free allotment, nominal and effective price

We start the discussion with *prices*. It is assumed that consumer prices are given. This includes the possibility that some components of the price vector are zero, so that consumers get some goods free of charge. Our analysis of price determination and of how consumer prices are affected by household behavior is deferred until Chapter 19. Here we discuss only the reverse relationship, namely how prices, once given, affect the household.

As established in section 16.4, the household budget constraint is hard. Indeed, the consumer's response to prices is substantial. But this responsiveness has a "perception threshold" which should be analyzed first.

The notion of *demand price* is familiar in standard microeconomics. It is the price which a certain consumer is willing to pay, *ceteris paribus*, for some product. The qualification is highly important. Demand price is a *partial* equilibrium category. Every other price, income and the household budget constraint are given. The demand price implies, in its pure interpretation, that the household's expenditure on all other items is consistent with it.

Observing demand price is extremely difficult since it is not certain – as we note shortly – that the consumer pays the demand price for any actual purchase. Maybe the actual price was less than he was ready to pay. But, if we abandon direct observations of consumer behavior and consider only what consumers say, it may easily happen that their answers to the interviewer are not accurate. A consumer may claim a willingness to pay so much for a given product – but when the time comes he may be unable to bring himself to direct the amount in question from expenditure on other goods. But let us assume that the problems of observation have been solved and a satisfactory general conclusion has been drawn from a sample survey.² We know the distribution of demand prices of potential consumers for some product or product group.

This can be shown in fig. 17.1, which is included entirely for illustrative purposes and is not based on an actual survey. Let us assume, to simplify the exposition, that we are dealing with kindergarten places. On the vertical axis we plot quantity, measured by the number of kindergarten places at a certain date. (We take the quality of services as given.) On the horizontal axis is the demand price, denoted by p_d . The curve in the figure

²The reliability of interview surveys can be increased by using adequate test questions. We know of many interesting studies aimed at finding the consumers' demand prices. For example, in Sweden a survey was made of the "demand rent" (bid rent) of households for flats of different type and in different locations. (See Gustafsson-Hårsmann-Snickars, 1976.)

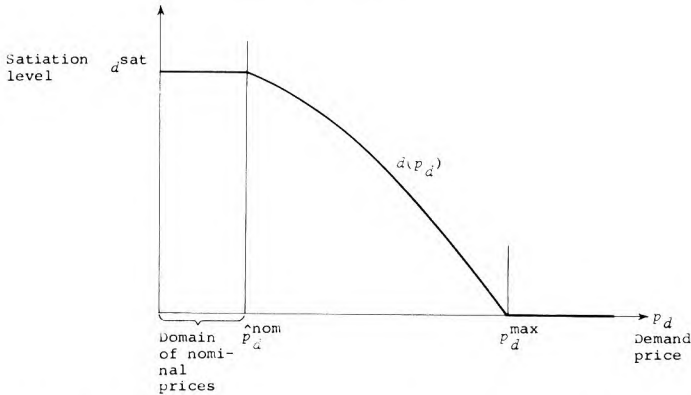


Figure 17.1. Relationship between demand price and quality demanded.

shows demand as a function of the demand price.³ That is, $d(p_d)$ indicates that all potential buyers willing to pay *at least* the demand price p_d demand altogether quantity d .⁴

$p_d = 0$ corresponds to the *satiation level* d^{sat} . We assume that the need is *finite*. In the present case this is trivially true, since the number of children of kindergarten age is also finite. It may be assumed, however, that the satiation level is *below* this maximum. Many parents would not enrol their children in a kindergarten, even if the service were provided free of charge.

In the interval $[0, \hat{p}_d^{\text{nom}}]$ of the demand price the function $d(p_d)$ is a horizontal line at the satiation level. These are still *nominal prices*.^{*} Those who would enrol their children in free kindergartens would still enrol them if the monthly charge were 5 or 10 Forints. *In the domain of the nominal price, price is not effective; demand is perfectly price-inelastic.* Raising the price, as long as it does not reach the critical value \hat{p}_d^{nom} , does not reduce demand below the satiation level. (It is a different matter that even nominal prices diminish income available for other outlays.)

³In drawing a continuous convex curve, we follow the conventions of demand theory. From the point of view of our own reasoning this is not essential. Our statements would be unaffected if the shape of the curve were different.

⁴The standard demand function, whose parameters are estimated on the basis of the observation of actual consumer purchases, can only be considered as approximating the theoretical curve presented in fig. 17.1 if definite conditions are met. And even if it may be considered as such an approximation, it is valid only in the neighborhood of the actual prices.

^{*}The term "nominal prices" is used in this chapter to mean prices which are too small to have a perceptible effect on consumer behavior. It does not mean prices measured in money terms. (*Editor's note.*)

The critical value \hat{p}_d^{nom} is the “perception threshold”. Above it, the price is *effective* on the demand side.⁵ A higher price will deter a growing number of people from using the services of the kindergarten, until finally, no one is willing to pay more than the demand price p_d^{max} . Above this price the demand is again perfectly price-inelastic. Accordingly, the domain of effective prices is $[\hat{p}_d^{\text{nom}}, p_d^{\text{max}}]$. For the time being we leave open the question of whether there is an “equilibrium price” within the effective zone. We merely state that below and above this zone price is ineffective.

The breakdown of household consumption between goods which the household receives free of charge or at a nominal price, and goods for which it has to pay the effective price is a very important indicator. One of the characteristic features of the socialist economy is the relatively high share of consumption which is free or almost free.

17.3. The satiation level

The *allocation* of products would not cause problems if the physical supply reached (or, to be safe, somewhat exceeded) the satiation level. Let us examine the problem somewhat more closely.

We can say that *any individual need can be satiated in the short run*, provided that other circumstances remain unchanged. The explanation for satiation is as follows.

(1) Some needs are *physically and/or biologically limited*. Nutrition and heating are examples.

(2) Consumption *takes time*, and the time available to the individual is limited. For example, even if entertainments were all free, the time needed for entertainment would limit demand.

(3) Consumption may be accompanied by *burdensome complementary phenomena*, and the wish to avoid them restrains demand. For example, even if urban bus transport were free of charge, no one would travel merely for the sake of enjoyment.

(4) Some goods or services can only be consumed with complementary inputs. Demand for the product in question may be limited by the constraints on availability of *complementary inputs*. Let us recall that we are dealing with satiation with a single good. For example, even if flats were free of charge, or if the housing rent were completely independent of the number of rooms, the households would still not claim inordinately

⁵The chapter does not discuss the effect of prices on the supply side. This has already been treated in Chapter 14.

large houses. They would be restrained by the fact that they could not furnish them, or that the cleaning involved too much work.

The various reasons may be found in combination. At any rate, it is the smallest of the four limits which determines the satiation level.

While every need has an individual satiation level, *the totality of needs is insatiable*. This is so partly because in the wake of changes in technology and culture needs are becoming increasingly differentiated; new needs are constantly appearing while others cease to exist. Satiation levels may also be increased by expanding complementary inputs. If people can afford more furniture and household equipment the satiation level for size of flat will rise.

Traditionally the socialist movement has characterized the distribution principle for society at the highest stage of communism as “to each according to his needs”. This would permit an allocation system which completely eliminated money. In practice socialist economies shelve this idea openly or tacitly making the justification that we still need time to think about it. But in fact, it is better to analyze this highly important problem objectively than to pass over it—either out of piety or with cynicism.

The truth is that society may be capable of satisfying *all* the material needs of *some* people—but then it will deprive others and condemn them to relatively lower consumption levels. Alternatively it is capable of satisfying *some* needs for *everyone*—but then it will satisfy some of their other needs much below the satiation level. But a society which would satisfy *every* citizens *every* need up to the satiation level is impossible not only today, but in the future as well. However much material welfare may increase, the development of technology and culture will always increase the material needs as well.

Under such conditions society faces several interrelated decision problems.⁶ Firstly, is there any particular need it wants to satisfy to the level of satiation? In fact, merely from the standpoint of physical feasibility and resources, any country at an intermediate level of development could undertake to satisfy some important individual needs to satiation level. Highly developed countries could do so on an even wider scale. Let us assume that in some such country it is decided that every household should be given a telephone free of charge and that local calls within the

⁶When we use the expression “society decides” we leave open *how* this choice is made. It may be made in the framework of anonymous historical processes, or preceded by conscious planning activity. Social decisions may be taken in any political, legal and organizational forms.

geographical region will be free as well. It would not be impossible to complete a telephone system which could provide complete satiation within a few years. Most people would certainly not use the telephone day and night even if it were free.

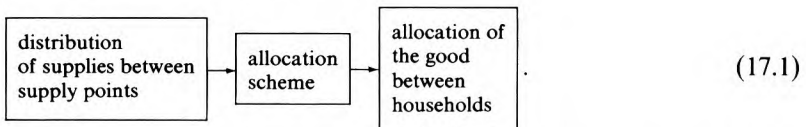
But, even if this is not impossible in the physical sense, it would require immense resources and draw them away from other uses. Therefore, *any system is extremely cautious about increasing the supply of any good or service up to the satiation level.*

If, however, the physical supply does not reach the satiation level, and if at the same time, the price of the product is not an effective one, there will necessarily be a shortage of the product. Even if the price of the product is effective, there *may still be* a shortage. (We return to this below.) But if the price is not effective, there certainly *must* be a shortage—provided that supply is below the satiation level. In the case of free or almost free distribution the shortage is *certainly* more intense than it would be in the case of an effective price.

Since we have arrived at this conclusion by way of a simple syllogism, it is most important that we should not make a step which is logically false. From what has been said, *no* unequivocal conclusion follows. Our line of reasoning has left open the question whether it is useful or detrimental to the interests of society if, goods whose supply is below the satiation level, are distributed free of charge or almost free of charge. Society may accept the costs of the shortage in the interest of other social benefits, for example allocation according to specified criteria. But we should recognize that shortage is a price which must *necessarily* be paid in such cases.

17.4. Allocation schemes

Later we shall revert to prices. For the time being, we know enough about them to start our investigation of *allocation schemes*. Let us first acquaint ourselves with relationship (17.1). Here, we are concerned with allocating a single product or group of products:



In the mathematical sense, an “allocation scheme” is a function which establishes a correspondence between physical supply and the allocation of

the product between households. This is usually determined not by a single complex decision but by a series of decisions involving several steps and taken according to definite rules. Accordingly an allocation scheme can be regarded as a decision algorithm.

The scheme does not usually determine the allocation of the product in an unequivocal deterministic manner, but operates as a stochastic rule.

Sometimes we have a deliberately planned form of allocation, for example a rationing system designed to meet definite criteria. On other occasions it is a spontaneous and anonymous social process.

Allocation schemes form an empirical category. In reality a great diversity of forms can be observed, but for the purposes of theoretical analysis the following three pure schemes will be considered:

- (i) auction;
- (ii) rationing; and
- (iii) queuing.

In reality these appear either in pure form, or—more frequently—as building blocks in combined schemes. There are also other schemes which differ from the above three or combinations of them. Forcible acquisition of goods is an example. In earlier historical periods these may even have played a more important role than the three above. In every contemporary social system however, the above three basic schemes or combinations of them predominate. Even if they do not exclude other systems, most goods are allocated to households with their aid.

17.5. Auction

The first scheme is called an *auction* and will be denoted for short by *A*. We do not aim at a general description but restrict ourselves to discussion of the special case when physical supply is given.⁷

The clearest situation is a real auction, for example the sale of a work of art. All potential buyers are present simultaneously and he who offers the highest demand price will get the commodity.

It is not necessary, however, for all potential buyers to be present at the same place bidding against one another. An equivalent allocation scheme,

⁷The adjustment of supply to demand has been discussed in Chapters 3, 6, 8, 9 and 14 – if only in respect of the flows of goods between firms. But, *mutatis mutandis*, the ideas expounded there can also be applied to goods supplied by the firm sector to the household sector. What has been said will be supplemented further by a few remarks in Chapters 19 and 21.

at the theoretical level at least, operates in several other cases as well. The model of allocation by auction will be illustrated with the aid of fig. 17.2. This repeats and adds to fig. 17.1, and therefore the simplest thing will be to continue with our earlier interpretation of the model. Let us assume that all kindergarten places in a country or region are sold "by auction" to the potential claimants. The claimants are ordered according to the demand price offered, proceeding in the figure from right to left. In first place we find the person who offered the largest amount say a monthly charge of 1000 Forints, in the second place those offering 990, and so on; at the end of the list are those who are willing to pay at most the nominal price or nothing at all, but still desire a place.

The number of kindergarten places, or the physical supply, is limited and it is below the satiation level. It is given by s and is denoted in the figure by a horizontal line. The price p emerges where this line intersects the demand curve. A *selection* takes place. The allocation scheme divides all claimants into two groups, those *who receive* the product and those *who are excluded* from receiving it. *The sole selection criterion in the auction scheme is the demand price.* It operates in a pure form only if the following two conditions are met.

(1) The buyers have been ordered strictly according to their demand price.

(2) The actual price is set precisely at the level at which supply is entirely allocated to those willing to pay this price.

This is *the Walrasian market equilibrium price.* Reference to Walras is justified in a double sense. Not only is this price known as the equilibrium price in the system of ideas of the Walrasian school. The name is also justified by the fact that Walras described an auction model of price formation and allocation.⁸ He was right to do so since this is a pure case of an ordering according to the price offered.

In the auction scheme every buyer whose individual demand price is lower than the actual price will *voluntarily* refrain from buying. The market has cleared in such a way as to exclude these buyers. We have derived a basic theorem of standard microeconomics. However elementary and well known it is, it should be stressed here, if only in order to consider the special conditions under which it is valid. *When purchasers' budget constraints are hard and the price is effective, some purchasers who desire the product, will voluntarily refrain from buying it.* And if, in addition, this price

⁸In Walras's model both demand and supply respond to the prices "announced" in the course of the auction.

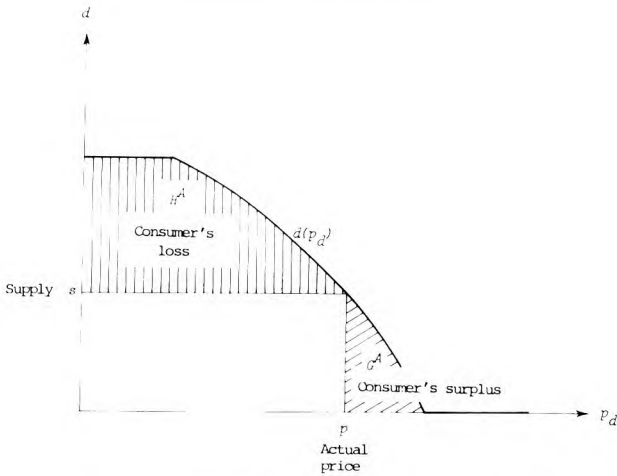


Figure 17.2. Allocation in the case of the auction scheme.

is found by the auction scheme, that is, if it is a Walrasian equilibrium price, then potential buyers will voluntarily hold back in precisely the right numbers for supply to meet the demand of those who have not withdrawn.

All those who would have been willing to pay a price higher than the actual price p , receive—to use the Marshallian term—*consumer's surplus*.⁹ The diagonally striped area gives the total of consumer's surplus, denoted by G^A . (A indicates an auction.)

Those who have withdrawn their claim at actual price p suffer a loss. This might be called *consumer's loss* or *negative consumer's surplus*. The vertically striped area in the figure gives the total of this consumer's loss, denoted by H^A . This is the amount which buyers excluded from consumption would have been willing to pay to receive the product.

Neoclassical economics likes to separate problems of *allocation* from those of *distribution*. The former concern the distribution of *products* among buyers, the latter the distribution of money *incomes* among classes, groups, and individuals in society. We shall not discuss here how the sources and distribution of incomes are related to social relations and the relations of production. We only underline that *every allocation mechanism has distributional consequences*. In the auction scheme “money talks”. The

⁹Earlier literature used the term “consumer's rent”.

person who is willing to pay more is at an advantage. Not only does he get the product; he also gets consumer's surplus.¹⁰

The ranking by demand price does not necessarily correspond to a ranking by wealth or income. There may be poorer families for whom it is highly important to place the child in a kindergarten and who thus offer a relatively high price at the cost of their expenditure on other items; conversely, there may be more well-to-do families only willing to pay a small amount. It seems certain – and this can be empirically tested – *that there is a close positive correlation between the wealth and income of the family and the demand price offered*. It is precisely this property of the scheme which provokes opposition by those who feel that this principle of allocation is unacceptable politically and morally. (We will return to the question of how far these consequences may be corrected by combining the auction scheme with other schemes.)

17.6. Rationing

The second basic scheme is called rationing and denoted by R .¹¹ Again we shall restrict ourselves to the case when physical supply to be distributed among households is given.

Two main variants are distinguished according to the person or institution *who decides* the ration. One is *rationing by the producer*: the producer of the good or service determines the allocation of his output among potential users himself, but *not* according to the demand price offered. This is abbreviated as R^{supplier} . The other main variant is *administrative rationing*, denoted by R^{adm} . For example the ministry may determine which household the firm should allocate the product to. In this case, therefore, the roles of *producer and allocator* are separate with different motivations and rules of behavior for each.¹²

Rationing systems may differ markedly in practice in degree of *disaggregation*. We shall only discuss a pure form where the rationing is done

¹⁰This could be taxed away by means of price discrimination if, for example everyone was obliged to pay the price offered and not the uniform Walrasian equilibrium price. But in this case we should have a different scheme.

¹¹The first attempts to model rationing mathematically emerged a few years ago. See, for example, Drèze (1975), Manove (1973), Shaw (1976), and Grandmont (1977). Several studies worth attention discuss the relationship between rationing and the price system. See, for example, Tobin (1970a) and Weitzman (1977).

¹²A combination of the two variants is conceivable if for example the producer decides on the ration in the first instance, but the claimant can appeal to the administrative authority if he does not agree with the decision.

in the finest breakdown (e.g. a particular flat is allocated to a particular family). Where the allocation is done in aggregate terms, complementary schemes queuing, for example, perform the disaggregated allocation. But this is a combined scheme instead of a pure form.

The various rationing schemes differ in respect of how active or passive the household is in the final allocation. Are the consumer's demands expressed in advance and, if so, to what extent does the actual rationed allocation correspond to their claims?

One or more *selection criteria* are used in the course of rationing. By definition these *cannot* include demand price. The very term rationing means *allocation according to nonprice criteria*.¹³ If in a real allocation mechanism *both* the criterion of demand price *and* one or several of the criteria listed below are employed, it should be regarded as a combined ($A + R$) scheme.

Without claiming completeness we shall list here a few characteristic selection criteria which are frequently employed in practice:

- (a) urgent need;
- (b) merit;
- (c) family background;
- (d) social status;
- (e) political conduct;
- (f) personal links of kinship or friendship with the allocator;
- (g) return of favors done to the allocator; and
- (h) corruption.

Few would deny the moral justification for criterion (a), *urgent need*. If auction and rationing schemes are compared from an ethical viewpoint, this selection criterion emphatically argues in favor of rationing and against auctions. If the capacity of a hospital is limited, should treatment be given to someone who needs hospital treatment from the medical point of view even though he cannot pay for it, or to someone who could also be cared for at home but who can pay the costs of hospital treatment? Urgent need as a criterion for selection comes to the fore particularly in the following cases, which often occur together.

(i) The *basic elementary needs* of every member of society must be satisfied. A minimum level of food, clothing, accommodation, health and education must be secured for everyone. That is, the allocation principle

¹³Our definition also has a negative implication: the selection criteria do *not* include order of arrival. The latter will be described as a separate pure scheme—queuing—in the next section. Otherwise, when speaking of selection, we shall mention again several problems already discussed in Chapters 4 and 6.

“to each according to his needs” must be applied up to a basic level, at least.

(ii) The needs of the *nonearning members* of the household must be met according to the principles of social justice. Even if the earnings of the parents are an acceptable payment for their labor performance, why should the standard of schooling or housing conditions of the children depend on this?

It does not follow from what has been said that rationing is the only method of solving these problems.¹⁴ We make the empirical observation, however, that it is the criterion of urgent need which has prompted decision-makers in several countries to introduce rationing. This motive is particularly strong in sectors such as health, education and housing, and, in countries at lower levels of economic development, the distribution of food.

Criteria (b), (c), (d) and (e) are much more open to question than criterion (a). No one objects to the latter on ethical grounds and people only challenge the precise definition of urgent need and question whether this principle should be applied through rationing. But there are many more people who doubt whether merit, family background, social status, and political conduct should be taken into consideration at all when consumer goods are allocated.

Again we make only an empirical observation, that there is no society in which these criteria of selection do not operate at all in the allocation of goods. The differences between various systems consist in (1) whether the criteria operate *openly* or *covertly*, through informal mechanisms; (2) whether rationing is done by an *administrative authority* or by the *producer* himself; (3) how widely rationing schemes based on these criteria are applied; and finally and most importantly (4) how the particular criteria are specified *in practice*. Let us take admission to university as an example. There is no university system in which admission depends only on the tuition fee offered, or demand price. The worth of an applicant, as shown by the school report, plays a role. But his family background (his color, religion, or nationality, or the occupation of his parents) may be an advantage or disadvantage as may the social position of his family and his family's or his own political conduct. How *criteria* (b), (c), (d) and (e) are used in a rationing system is an important indicator of the nature of any socioeconomic system. Precisely for this reason, it is impossible to judge

¹⁴Several combined schemes may be used. Some are applied in practice, others are proposed in the literature.

some scheme of rationing as being free from political considerations, exclusively on an economic or technocratic basis. The acceptance or rejection of any actual rationing scheme is inseparable from the political and moral values of the person forming the judgement.

The use of criteria (f), (g) and (h) is condemned by any openly declared and generally accepted moral rule; it is usually forbidden by law too. Nevertheless, there is no system completely free from such abuses. The issues are only how rarely or how frequently the criteria are applied and whether in important or essential decisions.¹⁵

The number of actual variants of the rationing scheme is immense, and the task for the social sciences is to provide a factual empirical description.¹⁶ The task is all the more difficult since, as has been mentioned, the selection criteria are not always openly declared. And even if they were openly declared, the actual selection process may deviate from the principles stated.

Any rationing scheme affects the distribution of income.¹⁷ It gives preference to some members of society over others. Rationing thus carries out a *redistribution* which overrides the distribution of money incomes. The effects of this redistribution can be described by many indicators. One indicator which deserves attention in this case too is the *consumer's surplus or consumer's loss* (negative consumer's surplus). Figs. 17.3 and 17.4 illustrate this; both continue the line of reasoning of figs. 17.1 and 17.2. Let us assume that an administrative allocation has taken place; the district council has decided how to allocate the kindergarten places in the region, for which a nominal charge, p^{nom} , must be paid.

Rationing divides all claimants into two groups: those obtaining a place and those not obtaining one. Members in each group are ranked separately, according to the demand price they would have been willing to pay if the kindergarten places had been sold by auction. The position of the first group can be seen in fig. 17.3. The area above the price domain $p_d > p^{\text{nom}}$ is the consumer's surplus of those getting places, and is denoted by G^R , where R indicates rationing. This is the sum the group would have been willing to pay above the nominal price to get places. The consumer's

¹⁵See the excellent paper by Hankiss (1978) about corruption.

¹⁶The allocation of housing has been studied by Swedish authors (see, for example, Lindbeck, 1967); rationing in the health service is analyzed by American researchers (see Cooper-Culyer, 1973). From the Hungarian literature of the allocation of housing see Konrad-Szelényi (1969) and Dániel (1978).

¹⁷On the distributional impact of free allocations and of rationing see Ferge (1975a,b), Ladányi (1976), and Dániel (1978).

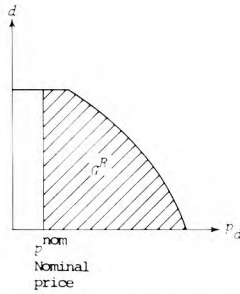


Figure 17.3. Consumer's surplus of those receiving a ration.

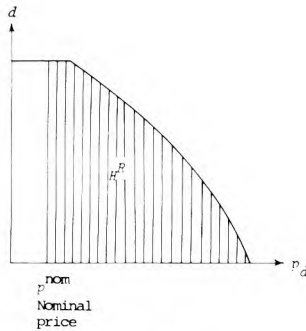


Figure 17.4. Consumer's loss of those not receiving a ration.

surplus is the social contribution made to them by the given system of rationing at nominal price p^{nom} .

Figure 17.4 shows the position of the second group. Here the area above the price domain $p_d > p^{\text{nom}}$ shows the *consumer's loss* of those who were *not* allocated places; their loss is denoted by H^R . This is the amount above the nominal price which those refused places would have been willing to pay.

No general statement can be made from a comparison of fig. 17.2 with figs. 17.3 and 17.4. The result depends on the nominal price p^{nom} in question and on the selection criteria used in the actual rationing scheme. Perhaps a substantial re-allocation has taken place compared with the hypothetical pure auction; this is not certain. Perhaps a relatively large number of families who could and would have paid a high price were given

places. Since they not only gain access to the service, but also get it at a nominal price, they increase their consumer's surplus.

The consumer's loss H^R is of great importance from two points of view. First of all, it is an important *indicator of shortage*, and as such it can be included among the components of the vector z indicating the intensity of shortages of consumer goods. It expresses the subjective judgement of the consumer regarding the loss suffered. Beyond that it reflects, in an indirect manner, the *inflationary pressure* on the consumer goods market. Refused claimants would be willing to spend the amount H^R on acquiring the service. This may work as a factor pushing up for example the prices of private kindergartens, baby-sitters, etc.

We must warn the reader, however, to interpret the indicator H^R with *caution*, not only because observing it is difficult, as has been mentioned. Even if it could be exactly measured, we should remember that it is a *partial* indicator. Let us assume that there are m products and n households. When household no. 1 declares what demand price it is willing to pay for the 1st product, it makes the declaration *ceteris paribus*, on the assumption that the prices of the 2nd, 3rd, ..., m th product remain unchanged and that its budget constraint is given. Maybe, under such conditions it would be willing to pay 20 percent more than the previous price for the first product. But if the prices of the 2nd, 3rd, ..., m th product increase simultaneously, it would be incapable of paying this increase. Therefore, the sum $\sum_{i=1}^m \sum_{j=1}^n H_{ij}^R$, total consumer's loss for every product and every household, is not a meaningful concept, and it certainly cannot measure the aggregate excess demand of households.

17.7. Queuing

The name of the third basic scheme is *queuing*, denoted by Q . Queuing has already been mentioned in Chapters 4 and 7 and is discussed in Mathematical Appendix A,¹⁸ but this mainly from the viewpoint of how firms react to queues as buyers. We now consider queuing as an allocation scheme.

As in the case of the two earlier pure schemes no general description will be attempted. Our remarks will be restricted to the case when the physical supply for allocation among households is given.

Three main types can be distinguished.

¹⁸We have already given references to the rich literature on queuing.

(a) *Physical queuing*. Those waiting to be served queue up in the literal sense of the word in front of the person making the good or service available.

(b) *Queuing by numbers*. Having obtained a serial number, the claimant may leave and return when it is his turn.

(c) *Allocation by order of arrival*. There may never be two claimants simultaneously present at the supply point, thus no queue can form. But as consumers arrive, each of them receives as much of the product as he wants, until it is sold out.

It is a common property of the three types that *the order of arrival at the supply point* (or equivalently the order of putting in a claim) *operates as the only selection criterion*. The person who comes *first* thus has an advantage over those who arrive later.

The order of arrival may be strictly random. But, under certain conditions, the order of arrival may be a function of certain explanatory variables. For example, a retired person or a housewife may be in a more advantageous position compared with employed people simply by virtue of *having more time for queuing*.

Studies published in recent years on disequilibrium theory frequently use the term "rationing" as a collective noun, meaning both the *R* and the *Q* schemes. In our view it is expedient to separate the two schemes strictly. In the *R* scheme a definite *person* (individual or an institution) makes a selection according to alternative possible criteria. Against that, in scheme *Q* selection is made by an *impersonal* process, exclusively on the basis of arrival time. This is a highly important difference which affects the social relationship between those who decide on the rationing scheme and those who receive the rationed good.

Much depends on the information available to the buyer. If the product arrives at the supply point at irregular intervals, then the supplier can help the claimant by telling him when to come for the product. In this case the queuing scheme only apparently operates. In reality rationing is taking place: the allocator has decided on the basis of his own selection criteria who should be at the head of the queue.

17.8. A mental experiment: The conditions for allocation by a pure auction

In reality it rarely happens that any of the three basic schemes operates in pure form; they normally operate in combination. It will help to understand the social conditions which make a combination of schemes neces-

sary if we first conduct a mental experiment to clarify the theoretical conditions necessary for allocation of products to take place according to the pure auction scheme. In section 17.5 we established two necessary conditions, but these are not sufficient, particularly since there we discussed only the special case where physical supply was given. Now the problem will be approached along a broader front, though even now we shall not strive for either completeness or maximum generality. We shall study an abstract market process in some particular market. The acts of purchase and sale are regularly repeated. The market is decentralized in the sense that sellers and buyers who are independent of one another take part and no administrative authority interferes with the allocation.¹⁹ We will describe the operation of the market as a sequence of events. Since it is a chain of events which are continually repeated, it makes no difference where we start.

(1) *Determination of the demand and supply prices: bidding.* An agent makes his bid for the next transaction on the basis of his previous experience. Price determination is treated in greater detail in Chapters 15 and 19. We restrict ourselves here to remarking that how quickly and how perfectly the bid affects the market depends on concrete features of the market. The descriptive literature dealing with capitalist economies emphasizes on innumerable occasions that, if not always and everywhere, then often and in many places, prices are sluggish, sticky, and rigid. This holds to an even greater extent for prices in a socialist economy. Let us denote by ξ the vector of indicators which describe *the rigidity of prices*. We shall not clarify the difficulties of measurement in detail, but only establish the convention that the value $\xi = 0$ describes the state when the price system is free from any rigidity so that the demand price, supply price, and the actual price which is found by agreement between buyer and seller respond immediately and perfectly to the actual state of the market. The more rigid prices are the greater the values taken by the components of ξ .²⁰

(2) *Perception of the price offer.* Every perception has two sides: the first depends on the object of perception, the other on the perceiver himself. Let us take an example from traffic. A motor car has arrived at a crossing.

¹⁹For the time being it will be left open whether this particular market is functioning within a capitalist or a socialist economic system.

²⁰In defining the variable ξ – and with similar variables to be introduced in the remainder of this chapter – the convention applied in the earlier chapters of the book will be continued. The Walrasian system will be described by a zero value for the corresponding indicators; and deviations from the Walrasian reference point will be expressed by a positive value of the indicator.

What does the driver's immediate perception of the situation depend on? It depends on whether there are traffic lights and on whether a cyclist who might cross against the red light can be seen, for if it is pitch black and the cyclist has no lights, he is objectively invisible until he reaches the lights of the driver's own car. These are *objective* conditions affecting the perception. Whether the driver of the car pays attention to the traffic light or crosses by mistake against the red is a subjective condition.

The indicators Θ describe both aspects of perception. The case $\Theta = 0$ holds if (a) the market is *completely "transparent"* for all buyers so that the supply prices of all potential sellers *can* be known objectively. (The same must hold with appropriate amendments for sellers as well.) (b) Each buyer pays attention to the supply price of each potential seller, because he has good reasons for doing so. (The same holds for sellers as well.) The indicators Θ measuring lack of responsiveness to price take the greater positive values the more the perception of price is hampered by objective or subjective obstacles.²¹

(3) *Adjustment of the real transaction to the price signal.* In Chapter 8 we introduced the indicators w to describe the *frictions* in adjustment. It was used there as a comprehensive category. If adjustment to any signal or feedback occurs incompletely and with a delay, this is symbolized by a positive value of some indicator w_i . Now we bring into the scope of the analysis only those components of vector w which hinder perfect adjustment to the price signal. We denote them by w_p .

Accordingly, $w_p = 0$ if the buyer (or seller) can adjust perfectly to the price signal without any friction. w_p has a greater positive value the stronger are the frictions which impede this adjustment. The emphasis is now on "objective" frictions. Up to now buyer has bought from seller X , because his price was more favorable than that of seller Y . Now Y offers a more favorable price. However, the buyer is withheld from shifting by the fact that the complementary inputs necessary for using the product offered by Y are not immediately available. Thus, w_p measures not how much he *would like* to adjust to the price, but how much adaptation he *can* make.

Before formulating our propositions, we introduce more notation.

Let $\alpha[K]$ be the share of any scheme K (pure or combined) in allocation. In particular, $\alpha[A]$ is that share of allocation accounted for by the pure scheme A . Its complement is $\alpha[\text{non-}A] = 1 - \alpha[A]$. The share of the complement thus gives the combined share of all schemes in which either A no

²¹The price-responsiveness indicator Θ specified in the foregoing is related to but not identical with factor ϑ introduced in Chapter 14.

longer appears in pure form, but either in combination with other schemes, or not at all. The shares $\alpha[K]$ are observable and measurable magnitudes. They are important characteristics of the system. Knowing them gives deep insight into how the economy operates.

We first state the following:

if $\xi = 0$ and $\Theta = 0$ and $w_p = 0$,

there is no price rigidity	there is complete respon- siveness to price	real reaction to the price signal is free from friction
----------------------------------	--	---

then it is possible that $\alpha[\text{non-}A] = 0$, (17.2)

distribution
takes place
exclusively
according to
the auction
scheme

if $\xi \geq 0$ and/or $\Theta \geq 0$ and/or $w_p \geq 0$,

then it is impossible for $\alpha[\text{non-}A] = 0$. (17.3)

Now a new dimension will be introduced into our description of economic systems. We can state what proportions of total trade in a particular market are accomplished by the various allocation schemes. Thus we have obtained a new criterion for the abstract Walrasian reference point: $\alpha[\text{non-}A] = 0$. *The Walrasian auction scheme can only allocate products by itself if prices are perfectly flexible and if agents perceive the prices perfectly and adjust to them perfectly.*

But even formulae (17.2) and (17.3) speak only about the *possibility* or impossibility of using exclusively the auction scheme. The possibility must be taken up too. If it is to be used exclusively it is also necessary that every agent should *wish* to apply this scheme. If, for whatever reason, the buyer (or the seller) prefers a seller (or buyer) who has greater social prestige, or to whom he is linked by personal friendship, or who has bribed him, in spite of his less favorable price the auction scheme will no longer operate in pure form.

This *may* happen even if condition (17.2) is otherwise met, so that the auction scheme could be used. But criteria of selection other than price

must play a role, if any of the conditions indicated on the left side of formula (17.3) are satisfied. This may happen either because prices are not completely flexible, or because agents are not perfectly sensitive to price, or because adjustment is not completely free from friction.

In (17.2) we stated the conditions for exclusive use of the Walrasian auction scheme based on *the behavior of agents and the characteristics of the control mechanism of the system*. But the problem may be also approached from another angle, starting from *the instantaneous state of the market*. This time we view the process of market adjustment in static rather than dynamic terms, analyzing a single moment of adjustment. Let us observe market i at date t , and consider the behavior of all buyers and sellers. If the prevailing price $p_i(t)$ happens to be the Walrasian equilibrium price, this ensures that the total supply exactly equals total demand. Thus, the auction scheme could make the allocation by itself. All buyers willing to pay the price $p_i(t)$ can satisfy their demand, while those who are not willing to pay are excluded. On the other hand, all those willing to sell their commodity at the price $p_i(t)$ can do so, while those insisting on a higher price are excluded.

But the situation is different, if at the given price $p_i(t)$ there is still unsatisfied demand or excess supply. Let us take the case of shortage. In this case some buyers who would be willing to pay the prevailing price must be excluded or, at least, cannot satisfy their initial demand. Since price cannot perform this task of selection alone, the use of other selection criteria is *unavoidable*. The situation is similar in the opposite case. We may thus formulate the condition for exclusive use of the Walrasian scheme starting from the state of the market:

$$\text{if } z_i(t) = 0 \quad \text{and} \quad q_i(t) = 0,$$

there is no shortage

there is no slack

$$\text{it is possible that } \alpha [\text{non-}A] = 0, \tag{17.4}$$

allocations are made exclusively according to the auction scheme
--

$$\text{if } z_i(t) \geq 0 \quad \text{and/or} \quad q_i(t) \geq 0,$$

$$\text{then it is impossible that } \alpha [\text{non-}A] = 0. \tag{17.5}$$

The close causal relationships between conditions (17.2)–(17.3) and (17.4)–(17.5) are discussed in several places of the book and we do not wish to digress now. Here we only underline an important lesson of the latter two conditions.

If at any instant any market deviates from perfect Walrasian equilibrium, non-Walrasian schemes must be used. These can either be schemes which totally exclude A or they may involve combinations with A . Let us investigate the combinations more closely.

17.9. Combined schemes

Combinations of schemes are surveyed in table 17.1. The table does not claim to be complete but lists the combinations which are most important for our line of reasoning.

First we explain the columns. It is a common characteristic of columns I and II that both an effective price and the auction scheme A play a role, while they do not do so in columns III and IV. Thus, the criterion is not whether money appears in the transaction at all. Insofar as trade takes place at a nominal price, monetary transactions are found in columns III–IV as well.

The first row shows allocation schemes which can be enforced in *the case of perfect adjustment*. In the preceding section we discussed in detail the conditions for the exclusive domination of scheme A . We may now add, on a similar level of abstraction, that with “perfect central control” all allocations can be made through R^{adm} , that is administrative rationing.²² Thus, the first row of the table shows two abstract points of reference. In real systems neither appears in pure form, operating on a permanent and general basis. In reality there is no *real* market in which goods are allocated exclusively by scheme A , nor a *real* centrally planned economy where allocations are made entirely by R^{adm} .

The second row contains schemes which can make allocations in the case of *shortage*. Let us start with column I, in which administrative rationing plays no role. In this case the effective price (which is lower than the Walrasian equilibrium price) performs the primary selection from

²²We have already pointed out in section 8.7 that “perfect central control” might be an abstract reference point for perfect adjustment. The appearance of the administrative rationing scheme in the first row of the table is a logical continuation of the line of reasoning begun there.

Table 17.1
Pure and combined allocation schemes.

		Effective prices exist and the auction scheme operates		Effective prices do not exist; the auction scheme does not operate	
		R^{adm} does not operate	R^{adm} operates	R^{adm} does not operate	R^{adm} operates
		I	II	III	IV
No shortage	A				R^{adm}
No slack					
Shortage	$[A + R^{\text{seller}}]$		$[A + R^{\text{adm}}]$	$[R^{\text{supplier}}]$	$[R^{\text{adm}}]$
	$[A + Q^{\text{buyer}}]$		$[A + R^{\text{adm}} + Q^{\text{buyer}}]$	$[Q^{\text{user}}]$	$[R^{\text{adm}} + R^{\text{supplier}}]$
	$[A + R^{\text{seller}} + Q^{\text{buyer}}]$			$[R^{\text{supplier}} + Q^{\text{user}}]$	$[R^{\text{adm}} + Q^{\text{user}}]$
Slack	$[A + R^{\text{buyer}}]$				
	$[A + Q^{\text{seller}}]$				
	$[A + R^{\text{buyer}} + Q^{\text{seller}}]$				

among buyers by eliminating those who are not willing to pay the prevailing price. But demand is still too high and further selection is necessary. This is done either by the seller applying some combination of the criteria (a)–(h) listed in section 17.6, or buyers are served on a “first come, first served” basis.²³ Or both nonprice selection procedures are combined with selection by price.

Let us proceed further along the row. In column II we find combinations of the auction and administrative rationing schemes. This is used in some socialist countries to allocate cars, or condominium flats which are built by state firms but offered for sale to private parties. An effective price has to be paid for both goods, yet there is still a shortage. The supply of cars and condominium flats (or a part of that supply) is allocated administratively among those willing to pay the price. Perhaps the date of putting in the claim plays a part too; in other words the scheme Q^{buyer} is involved in the allocation.

Sometimes there is the further possibility of combination [$A + R^{\text{adm}} + A$]: the lucky recipient of the rationed commodity sells it for money to another buyer.

Proceeding along the row, we come to column III. This includes schemes which make allocations in conditions of shortage without either effective prices or administrative rationing. In section 7.8 we mentioned the *vegetative control* of production which is a kind of “quantity” adjustment, which takes place without price signals while being decentralized at the same time. The schemes in column III resemble this system in the sphere of allocation. They allocate certain goods and services without effective price signals and without administrative rationing. This happens when a hospital or a university decides on its own criteria whom to admit as patient or student. The rationing may be carried out according to the various criteria used in the rationing scheme or perhaps they may also take into account the order in which applications arise as a further criterion.

Many services which are free or charged for at nominal prices are allocated exclusively by queuing. Examples are the use of free places of entertainment, sports grounds, free parking places, and so on. If the free beach or the free car park is full, latecomers are excluded.

The importance of the queuing scheme is further underlined by the fact that it fills the vacuum left by other schemes. All those products and services which are not covered by the other “organized” allocation schemes of distribution, have to be allocated somehow. The truth is that

²³The market described in Mathematical Appendix A operates according to allocation scheme [$A + Q^{\text{buyer}}$].

the “first come, first served” criterion of selection is a rather civilized and fair form of allocation which relies on the voluntary restraint of all eligible users. Where the A and R schemes do not operate and where the vacuum is *not* filled by the Q^{user} queuing scheme, rougher and more aggressive selection criteria of the “take what you can get” type necessarily prevail. Remaining with the above example, hooligans drive peaceful bathers away from the free beach.

Finally, the last part of the row dealing with shortage, in column IV, is occupied by allocation schemes which incorporate administrative rationing as well. Here, of course, the pure R^{adm} scheme appears. But this may be combined with rationing by the supplier. This is the case, for example, if the central educational authorities dispose of some university places while the universities allocate others themselves. Administrative rationing may also be combined with queuing; if the rationing authority takes into account the submission date of a request, as well as other selection criteria.

For the sake of brevity we refrain from commenting in detail on the bottom row of the table – the case of *slack*.

Three general remarks should be added to table 17.1.

(1) It is a problem to decide which of the schemes described here should be considered as having a *market* character. There are few categories in economics which are subject to so many different and partly contradictory interpretations as the notion of “market”. Two interpretations will be stressed.²⁴ The first is *wider*. According to this every horizontal relationship linking seller and buyer in a transaction should be considered as a market, even if effective price plays no role in it. Accordingly, a market mechanism operates even if both the buyer and the seller respond only to “quantity” signals from one another. The other interpretation is *narrower*. It limits the term market to those relations between buyer and seller in which an effective price plays a substantial role in controlling the behavior of the agents.

If the *wide* interpretation is applied, the schemes in columns I and III qualify as allocation procedures with a market character. In the *narrow* interpretation, however, only schemes in column I can be considered as market schemes.

Presumably, every economist would agree that the schemes in column IV are *nonmarket allocation procedures* and that in column II *market and nonmarket allocation* schemes are combined.

²⁴This has been done already in Part I. (See footnote 1 to Chapter 7.)

(2) The classification system of table 17.1 does not take the *legal* status of the different schemes into account. Let us look at column I, where the schemes involving trade at effective prices are shown. In a particular country at a particular time the law permits the trading of some goods and services, and prohibits the trading of others.²⁵ In the latter case, either the legal prescriptions are strictly enforced so that breaking them means a “black market”, or observation of the law is not so severely enforced in practice and then we have a “grey” market—with various shades of “grey”.²⁶ In any case, we must recognize that “black” and “grey” markets perform market allocations too, by offering commodities to buyers at effective prices.²⁷ Their functioning may thus be described by the schemes in column I.

(3) Many goods and services are allocated in the same economic system, in the same period, through several kinds of scheme. This is called *parallel* allocation. In many cases this is a *double* allocation: the products pass in parallel through two kinds of channel. It also happens that three allocation schemes, or even more, operate side by side.

Let us take as an example the supply of medical services in countries where there is general social insurance and a national health service and parallel to it (legally or at least on the “grey market”) there are also private medical services. In such cases, though certain services may be monopolized by the socialized sector, others (for example simple personal visits to a general practitioner) may be allocated by both methods. Each allocation procedure is itself a combined scheme. Let us denote the first by E_1 ; it comprises $[R^{\text{adm}} + R^{\text{supplier}} + Q^{\text{user}}]$. The second will be denoted by E_2 , and is composed of $[A + Q^{\text{buyer}}]$. Schemes E_1 and E_2 supply the user with the same product or service, or at least close substitutes; in a sense they are competing with each other. They differ from each other perhaps in quality or price of the product or service supplied (zero or nominal price *versus* effective price), and in nonmonetary “costs”, the burdensome phenomena accompanying use (queuing time, etc.). And, last but not least, they may differ in the *social relationship* obtaining, which involves subordination or superordination depending on whether the user is at the mercy of the supplier among other things.

²⁵There are prohibitions in every system. Even in the most “free-market” countries the white slave trade, assassination by hired killers, trade in “hard” drugs, etc. are prohibited.

²⁶See the paper “Shortage and black market” by Tarnóí (1975).

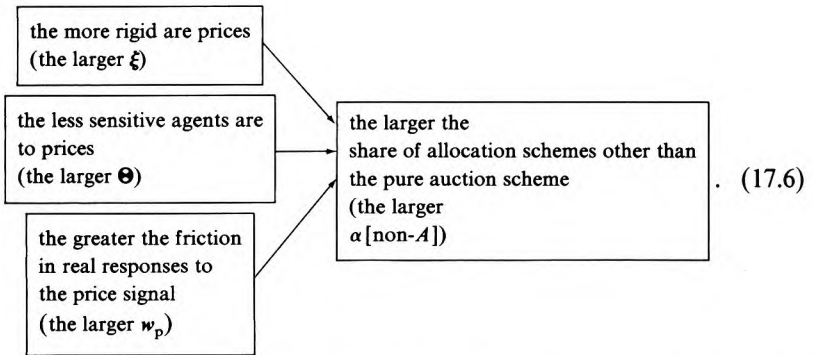
²⁷The “black” and the “grey” markets are important constituents of the “second economy” mentioned elsewhere in the book.

17.10. The relative scope of the schemes: General interrelationships

Table 17.1 is not a menu from which we may choose the most attractive allocation scheme according to taste. The nature of a particular socio-economic system fundamentally determines which allocation schemes should operate in which sphere, or at least it narrows down the set of alternatives from which decision-makers may choose. In the remainder of the chapter we shall examine what influences the relative shares of the various schemes in the allocation process. The analysis will be made in two steps. In the present section, at an *abstract* level, using the conclusions of the whole book, and particularly of the present chapter, we examine the factors which influence the allocation mechanism. Here we still discuss rather general interrelations and we distinguish neither socialist and capitalist economies, nor different forms of each. These distinctions will come to the fore in section 17.11 because there we shall describe empirically observable *historical tendencies*.

In the course of our theoretical analysis we stress – without claiming completeness – the effects of four factors.

(i) *The less the influence of price on the behavior of the buyer and the seller the smaller the allocative role of the A auction scheme and the more it is complemented or replaced by other schemes.* This statement is a logical continuation of the line of reasoning started in section 17.8. Following on from formulae (17.2)–(17.3), and using the same notations, we state the following relationship:



Formula (17.6) merely outlines the relationship. It seems capable both of theoretical justification on the basis of more rigorously formulated deductive reasoning and of estimation with empirical data, since all variables are *observable and measurable*.

(ii) *The more intense the shortage normally is, the larger the allocative roles of administrative rationing or rationing by the supplier, and of queuing by buyers or users.* Here, again, the line of reasoning applied in section 17.8, this time in formulae (17.4)–(17.5), can be continued:

$$\boxed{\begin{array}{l} \text{the larger the normal} \\ \text{intensity of shortage} \\ \text{(the larger } z^*) \end{array}} \rightarrow \boxed{\begin{array}{l} \text{the larger the share} \\ \text{of allocation schemes other than the} \\ \text{auction scheme} \\ \text{(the larger } \alpha [\text{non-}A]) \end{array}} . \quad (17.7)$$

Like formula (17.6), (17.7) merely indicates a functional relationship in verbal form. But it too seems to be liable to specification in theoretical terms, and perhaps it can also be estimated by empirical observation of the variables.

We draw attention to the fact that our statement includes the qualification “normal”. Formulae (17.4)–(17.5) stated that an *instantaneous* deviation from the Walrasian market equilibrium made it unavoidable for non-Walrasian schemes to be included in the allocation process. If, however, the normal state of the market is not too far from the Walrasian equilibrium, the other non- A schemes play roles which are merely complementary to that of scheme A . It is basically effective price which separates the buyers persisting in their intention to buy from those abandoning it, and the sellers persisting in their intention to sell from those abandoning it. In this case, only minor emendations are made by schemes R^{seller} , R^{buyer} and Q^{buyer} , Q^{seller} .

The situation is different if the *normal state* of the market deviates in essential respects from the Walrasian market equilibrium. If there is a lasting and intense shortage, then the R and Q schemes no longer play a complementary, or auxiliary role, but become dominant.

In a resource-constrained economy with suction, there is an intrinsic tendency towards increasing the role of rationing and queuing schemes, while in a demand-constrained economy there is an intrinsic tendency towards increasing the role of the auction scheme.

(iii) *The more monopolistic a firm or nonprofit institution becomes, the more it uses the R^{seller} , R^{supplier} and the Q^{buyer} , Q^{user} schemes in the allocation of its own goods and services.*

Using Kalecki’s notion,²⁸ the degree of monopoly influences not only the firm’s ability to determine the price, but also the extent to which it may employ nonprice criteria in allocating its output.

²⁸See Kalecki (1964).

(iv) *The larger the economic role of the state and the greater the importance of the redistribution of household income in the state's economic policy, the larger the allocative role of the R^{adm} scheme, either by itself or in combination with other schemes.*

The above interrelations are of extreme importance. The relative proportions of the allocation schemes cannot entirely be explained by economic factors taken in the narrower sense; they are also affected by the political power structure of the system. But an examination of the problem goes beyond the scope of the book.

We should mention here that the generally accepted moral views, norms and traditions of society play important roles in determining the scope of allocation schemes. There are no eternal frontiers. In slave-holding societies living people were bought and sold by auction. There were times when wives or husbands were bought at "effective prices". While some allocation problems come to be solved by one or another scheme, others cease to be. But this leads on to the theme of the next section, namely the discussion of historical tendencies.

17.11. The relative scope of the schemes: Historical tendencies

There is a widespread belief that the historical trend points unequivocally towards some allocation scheme, or combination of schemes. Many advocates of the neoliberal school, for instance, consider allocation by the market to be the last word in history. Historically, as time has passed, the role of the market has always been growing. There have been and continue to be halts and setbacks, but these are only transitory, as the market sooner or later gets the upper hand. A diametrically opposite view emerges again and again both in socialist and other leftist movements in capitalist countries, and in the intellectual life of the socialist countries. According to this view central distribution, the R^{adm} rationing scheme, will become more and more dominant. The expanded scope of the market in socialist countries since the reforms is, whether it is politically justifiable or deplorable, merely a transitory retreat, which will be sooner or later reversed by administrative rationing.

As regards secular tendencies, the real proof will be given by the actual course of future history. Considering only a few decades, contradictory tendencies may be observed both within capitalist and within the socialist systems. Which, if any, will be the *dominant* tendency, measured on a *secular* scale? However exciting this question may be, the answer belongs

rather to the realm of prophecy than to the scope of science. In the present book we restrict ourselves exclusively to identifying partly contradictory tendencies which are actually observable over the last *decades*, and we do not undertake to extrapolate any of the trends into the long term.

A detailed analysis of *capitalist economies* is outside our scope and thus only a few well-known phenomena will be briefly indicated.

(a) Even in those areas where allocation is performed basically through the market (and the greater part of the economy belongs here), the *pure* form of Walrasian auction is very rare, and various combined schemes are more frequent. For example, in conditions of imperfect competition the sellers take into account many other selection criteria than the demand price. The more monopolistic or quasimonopolistic a seller becomes, the more he can “ration” his products among potential buyers.

(b) The government authorities and nonprofit institutions (including the armed forces) do not usually make their purchases purely according to the auction scheme, comparing prices only, but they use many other selection criteria as well. There are also many personal links and other connections between leading government agencies and huge corporations.

(c) The state interferes with the allocation of goods and services in many fields and thus combined schemes with both market and nonmarket elements come about. For example, flats in many big towns are allocated in this way.

(d) The role of nonprofit institutions is growing, particularly in services such as health and education. Administrative allocation, rationing by the supplier, and the various combined forms of each are appearing in these fields. A parallel allocation system usually operates, the shares of market and nonmarket procedures differing from country to country.

The economic schools which basically favor the capitalist system, but criticize its current state, do not take an unequivocal stand over these phenomena. Keynesians agree with and support these changes in many ways; they initiated some of them. The liberal school vociferously objects and betrays a nostalgia for times when competition was freer. They frequently blame the Keynesians for the current state of affairs. As a matter of fact, although Keynesianism undoubtedly had a strong effect—the changes have been brought about not by the influence of one or other system of ideas, but by social forces which are much more deeply rooted.

Let us now turn to the *socialist* system. In table 17.2 an attempt is made to give a summary survey. We do not want to lose ourselves in too much detail. Therefore, no attempt is made to describe the many differences

Table 17.2
Role of different schemes in allocation to households in socialist economies.

Product group	I First years after the revolution; period of civil war, or war	II Relatively peaceful period with a traditional system of economic management	III Postreform system of economic management
Food	Nonmarket for many products Market (legal or black market) for some foodstuffs	Market	Market
Clothing	Nonmarket for a few products Market for most products	Market	Market
Other industrial goods	Market	Market	Market
Urban dwellings	Nonmarket	Nonmarket in most cases Market in a few cases (mainly grey and black market)	Nonmarket in many cases Market to an increasing extent (mainly legal, but partly grey and black market) "Mixed schemes" in a few cases
Cars	–	Mainly "mixed scheme" Market in a few cases	Mainly market "Mixed scheme" in a few cases
Recreation, tourism	–	Mainly non-market Market in a few cases	Partly non-market, partly market
Education	Nonmarket	Mainly nonmarket Market in a few cases	Mainly nonmarket Market in a few cases
Health	Nonmarket	Mainly non-market Market in a few cases, (either a legal or a grey market)	Mainly non-market Market in a small but increasing number of cases (legal or grey market)

between countries. Instead, we only distinguish in a somewhat generalized, or stylized form three historical periods. The first covers the years immediately following a revolution and periods of civil war or war with an external enemy. The second is the relatively peaceful period after the armed conflict, in the framework of traditional economic management. Columns I and II cover the Eastern European socialist countries more or less generally. Column III treats the state after the reform; here we have in mind mainly the Hungarian situation after 1968.

Many of the rows in the table cover broad sectors. Separate rows are given to some items whose share in total household consumption is low, but where the form of allocation has shown remarkable changes. However, the rows do not cover total household consumption.

The entries of the table use the terminology introduced in section 17.9. The term "market allocation" is used in the narrow sense only covering schemes in which an effective price has a role, where at least one component is the A auction scheme. We do not reserve the name "market allocation" for the *pure* Walrasian auction scheme, but include here various combinations of A with R and Q . Thus, in our table we find the term "market allocation" covering markets where very intense shortages occur, as shown by sellers selecting from among buyers, buyers queuing and so forth, provided that the buyer purchases the product in question at an effective price and no administrative authority participates in the allocation using a rationing scheme. (For the list of the combined schemes belonging here see column I of table 17.1.)

The term "non-market allocation" is used for cases where price plays no effective role whatever, and where allocations are made by administrative rationing alone or in combination with other schemes. (For a list of these see column IV of table 17.1.)

"Mixed" systems cover cases where effective price and administrative rationing appear together [$A + R^{\text{adm}}$ + perhaps other schemes]. (See column II of table 17.1.)

The table speaks for itself; we shall restrict ourselves to drawing three more general conclusions.

(1) In no historical period did rationing have an exclusive role in the supply of the household sector in any socialist country, either in its pure form or combined with other schemes. The market scheme always played a role in allocation. (The fact that the market allocation may have been far from the Walrasian point of reference is a different matter. This will be discussed in the next chapter.)

(2) As we proceed from column I to II and from II to III, we find wholly nonmarket allocation procedures in fewer and fewer entries of the

table and a growing number of entries where the market either performs the allocation function alone, or at least appears side by side with the nonmarket procedures, eliminating the latter's monopoly.

(3) In the above statement we looked only at the *number* of entries in a column, irrespective of *their relative shares*, and the dynamics of these shares. In this respect the tendencies are contradictory. On the one hand, the allocation of product groups with a growing share in expenditure, such as the car or tourism and, above all, housing, has become more "market-like". On the other hand also groups with a growing share, such as education and health, have remained with the nonmarket allocation scheme.

The table surveys the course of events *up to now*. In the socialist countries discussions are going on about the future directions in forms of allocation. In view of the general subject of the book, I do not wish to take a stand in this debate. On the basis of the analysis performed in this chapter, I would make a single comment only. Quite a few participants in the debates make the logical error of comparing *practical experiences* with the allocation methods which they criticize, with the *abstract theoretical model* which they *desire and propose*. Adherents of the market justly pointed out the burdens of queuing, as well as the many difficulties of rationing schemes such as the arbitrary and socially unacceptable criteria of selection, the professional incompetence and doubtful morals of some of the officials doing the rationing, the sluggishness and rigidity of the procedures, and so on. Then they compare rationing with the market—in its pure Walrasian form, with its perfect objectivity and instantaneous and unflinching adjustment. Conversely, the enemies of the market justly point to the fact that the markets operate with frictions, lead to wastage, and frequently respond to signals with a delay; that the Walrasian system, if applied in its pure form, leads to social injustices, to giving preference to the rich and so on. And they compare with it a rationing scheme in its pure form, applying only socially justified selection criteria operated by quick, competent and morally blameless people.

Such discussions are barren. Most fruitful discussions confront the actual experience of one scheme with that of another. We should attempt to make a sound assessment of how allocation schemes have or might operate in the hands of living people and within the organizational framework of the system in question.

The household: Consumer behavior

18.1. Introduction

The main theme of this chapter is consumer behavior.¹ We have by now developed most of the analytical apparatus which we shall use to describe the position of the household in a shortage economy. To a certain extent the chapter repeats material already covered. It may be conceived of as an *application* of our more general findings to the special case of the household. This application naturally requires some transformation and supplementation.

A major part of the chapter discusses phenomena which appear equally in the *traditional* and in the *postreform* systems of economic management of socialist economies. Where there are differences, this will be separately indicated.

In characterizing the behavior of the household, we set out from the following assumptions.

(1) The total money income of the household is given. Chapter 16 discussed its most important component, wages. Although there are other forms of income, this book does not consider them.

(2) As we emphasized earlier, in a socialist economy *the household's budget constraint is hard*. This is not an assumption which we make in order to simplify the analysis, but a fact which can be empirically verified. We remind the reader of sections 13.3–13.4 where we indicated when the budget constraint of an economic unit should be considered hard or almost-hard. In the light of the criteria set out there, there can be no doubt that we are dealing here with a hard constraint. True, there are products and services which the household obtains free of charge. These were treated in the preceding chapter and will now be mentioned again. The

¹The terms “consumer” and “household” are used synonymously to describe the user of a good or service. We do not discuss how decisions are taken *within* a household of several persons, or how goods are allocated within such a household.

household may strive to get more of the free service and thereby increase its consumption—even with a given budget constraint. But it can only get as much of *products to be had for money* as it can afford. In the case of severe shocks, natural disaster, for example, or other extraordinary difficulties a household may obtain state aid. But once the extent of such exceptional or regular state aid in money terms has been decided it becomes a given component of the revenue of the household and so the budget constraint remains hard.

The constraint may be even harder in a socialist economy than in a capitalist one, because the scope of the credits extended to households is much narrower. Personal loans exist; some durable consumer goods may be bought by installments; self-built residential accommodation is granted bank credit. But these credits, even taken together, finance only a rather small part of total household expenditure. Credit availability is limited by many kinds of restrictions. Repayments are rigorously collected; extensions are only granted in extraordinary cases. Apart from rare exceptions, a household cannot get into an overdraft.

When we state that the budget constraint of the household is hard, our reasoning at this point coincides with the neoclassical theory of the household.²

(3) The supply of consumer goods is given. We shall examine how consumer behavior is affected by supply—but the feedback will not be discussed. We do not analyze how the seller is influenced by consumer behavior, nor how the producer is affected if the seller is not the producer.

(4) It is assumed that the household takes consumer prices as given. In reality the household is often, but certainly not always, a price-taker. Many kinds of consumer prices develop as a result of real bargaining. And even if the price is given for an individual household, the behavior of all households together may affect prices. All these interrelations will be treated in Chapter 19.

(5) Finally, we take the scope of the different allocation schemes described in the preceding chapter as given. It has already been decided through what scheme or schemes a product may be obtained by a household.

²Acknowledging this agreement makes it easier to understand the disagreement. The neoclassical school usually starts from a description of the behavior of the household and illustrates its conceptual apparatus in this way. And, having (justly) introduced the assumption of a hard budget constraint for the household, this is extended without hesitation to firms too. Yet in fact, the constraint on the latter may be soft.

Sections 18.2–18.4 describe the *instantaneous* adjustment of the buyer at a *submicro*-level. Beginning with section 18.5 we pass to the *micro*-level, and also analyze the *short*- and *long*-term decisions and actions of the buyer.

We start our discussion by reviewing *the algorithm of the shopping process*. A similar description has already been given earlier, in Chapters 4 and 7, for the special case where the buyer is a firm and the process is not affected by prices. Now we shall look at this algorithm again but this time the household will be the buyer and prices will be included among the factors affecting the process. We cannot neglect prices, because the budget constraint of households is hard and they cannot escape the effect of prices.³

In Chapter 4, on the socialist firm, we established that the firm's responsiveness to price is weak. However, some propositions made in the present chapter could also be extended to the firm insofar as it responds to prices. There is no space to elaborate this extension here.

18.2. The beginning of the process: Resolving the dilemmas of parallel allocation schemes

As in Chapter 4, the shopping process will be illustrated with the aid of flow charts used to describe computer algorithms. To facilitate reference, the fields will be denoted by capital letters. For the time being, we shall describe the purchase by a single buyer of some product on a single occasion. We describe how the buyer instantaneously adjusts to the given supply. His every decision and action is an elementary event on the *submicro*-level. Later we shall discuss repeated processes and all buyers and all products taken together.

We will not discuss at all those products which are allocated *exclusively* by administrative rationing. We have already said what we wanted to on this matter.⁴

We pointed out in the preceding chapter that in a socialist economy several goods and services are allocated through two or more schemes *in*

³The shopping process described in Mathematical Appendix A may be interpreted as describing the purchases of a firm or those of a household.

⁴In section 17.6 we indicated how a person obtaining an administrative ration may try to influence allocation in his own favor.

parallel. In Hungary today, someone wanting to get a flat may put in a request to the competent authority, asking to be allocated a low-rent state-owned flat. Or he may ask to be allocated a cooperative flat, for which he has to pay a considerable sum, although much of the building cost is covered by the state or advanced as a large loan. He may start building with his own resources and apply for credit to complement his own funds. Or he may buy a private apartment or a house on the free market at a high price. The number of variants has not yet been exhausted, but this will suffice to indicate that several kinds of parallel allocation schemes are operating simultaneously.

In fig. 18.1 *Field A* simply establishes whether we are dealing with a product which is allocated by several (at least two) schemes in parallel. Continuing the above example, in the case of a flat the answer is yes; in the case of foodstuffs, it is no. In Hungary today food is not rationed through tickets, but reaches households extensively through the market. In this case, then, leaving out the fields in between, we immediately jump to *Field D*. But let us stay with the case when parallel allocation schemes do exist. The way of making a request for a product which is administratively rationed is usually regulated in legal rules. Let us assume that the household is entitled to put in a claim. It must decide whether to do so. Then we come to *Field B* in the algorithm and the question of which scheme to participate in.⁵ This is a far-reaching choice, particularly if an important item of consumption is at stake. As a matter of fact, nonmarket and market schemes appear in parallel most frequently for exactly such important items and particularly in the allocation of flats, certain health services, child care facilities, etc.

The attraction of the administrative rationing scheme is obvious. The household may obtain the desired good or service more cheaply than if it were bought on the market. The rent of a state-owned flat is almost nominal; the medical service provided by the social insurance system is free of charge, the fees of state kindergartens are nominal, and so forth.

Against the financial advantages there are grave disadvantages. With some services, particularly flats, the waiting time may be very long. In addition, at the time of putting in the claim the household does not know for certain whether it will be refused. In some fields the quality of goods or

⁵In some cases it is possible—legally or semilegally—to participate in several schemes *simultaneously*, making use of loopholes in the law. In such cases a new dilemma arises: is our household willing to back several horses at once, to pay the necessary money and accept the trouble and risks involved?

In order to simplify the discussion, this special choice problem is not included in the flow chart of the algorithm.

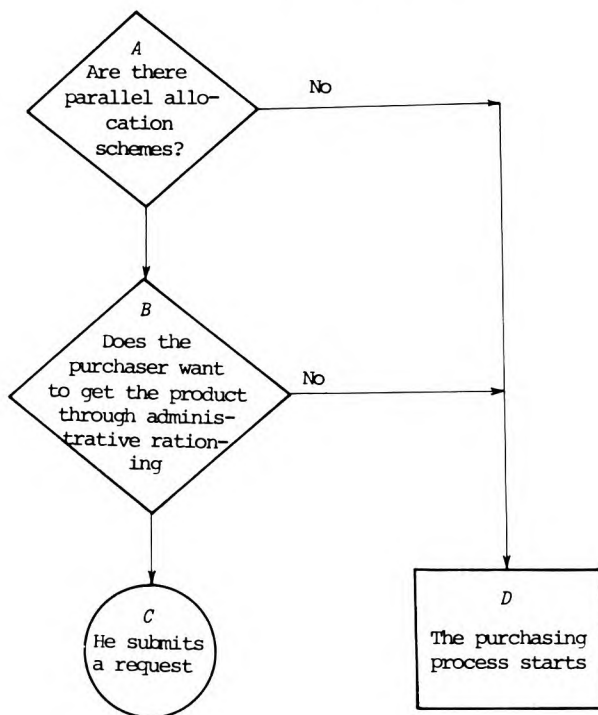


Figure 18.1. Branches for the case of parallel allocation schemes.

service obtained through rationing is poorer than the quality of goods distributed by the market scheme.

Many households have no real choice because with their given wealth and income they cannot resort to the more expensive market scheme. However burdensome the accompanying circumstances, they *have to* choose the administrative rationing scheme. With others, however, the question is not decided at the outset. This obviously depends also on the specific product or service in question. It may be a flat which costs perhaps several hundred thousand Forints on the market, or a single visit to a private doctor costing one or two hundred Forints. Almost everyone could afford the latter occasionally, so the dilemma is quite a general one.

The appearance and growth of parallel allocation schemes has produced much discussion. Many of the salutary effects of the market schemes have appeared to complement administrative rationing. Allocation has become more flexible. A healthy competition may develop between the sectors

producing goods for allocation by the different schemes. The growing purchasing power of the population may be partly absorbed. Someone earning his money honestly has a chance to spend it on what he really wants. At the same time, the rationing scheme surviving beside the market scheme is increasingly able to enforce the criteria of need and merit in allocation. Unfortunately, however, the symbiosis of the two kinds of schemes is not harmonious. Parallel allocation sharpens inequality, or rather the perception of inequality, by making it quite conspicuous. Allocation principles become entangled. Someone who has waited for years for an administrative ration is resentful of those who can afford to buy on the market. And someone who pays a lot for a good or service is bitter because he has made extraordinary sacrifices for something which someone else has obtained almost free of charge, as a gift from the nation.

It is not the task of this book to propose practical solutions; here we only want to draw attention to the great importance of the problem. But let us return to the shopping algorithm. The choice problem represented by *Field B* cannot be described with the aid of the standard microeconomic model of the household. We are not making a choice between substitutes where each good or basket of goods has a definite money price. Here we have simultaneously to weigh up costs and benefits measured in terms of money at current prices and costs and benefits that are not measured (or perhaps even *cannot* be measured) in terms of money.

Insofar as the household has decided—whether forced by its financial situation or by freely weighing the advantages and disadvantages—to obtain the product through administrative rationing, it has eliminated itself from further purchases. This is illustrated by the final circle denoted *Field C*. The household entering it is no longer a buyer, but a claimant waiting for the ration allotted by the rationing authority.

Insofar as the household has opted for the market scheme, it has to step into *Field D*; and to start the true *shopping route*.

18.3. The process continued: The effect of relative prices

The algorithm is continued in fig. 18.2 where *Field D* from the lower right-hand corner of the previous figure appears again in the upper left-hand corner. Since from now on we shall only speak of market allocation, the story may be illustrated with the example of a housewife buying meat for supper. It is a simple, everyday act and not a decision of

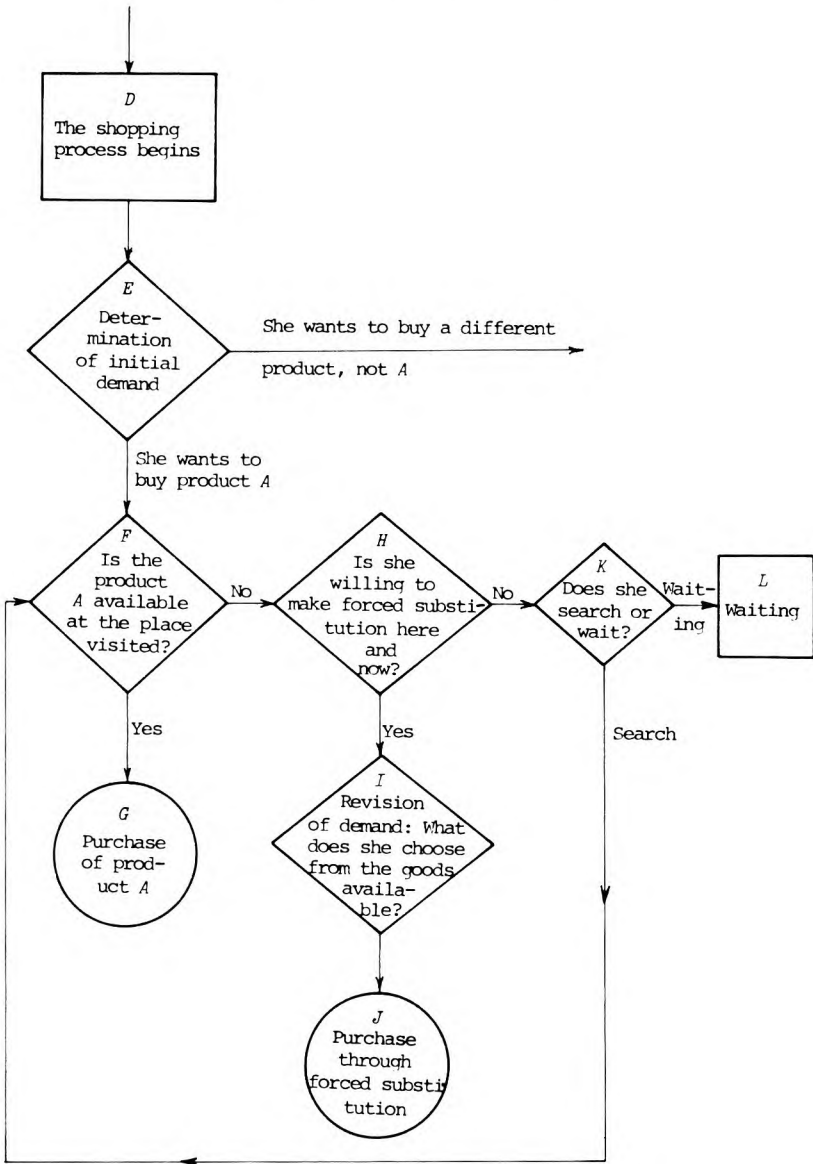


Figure 18.2. Formation of initial and revised demand.

great importance such as when the household decides on a flat, or chooses a doctor or child-care facilities.

The first step is shown in *Field E*: this is where the initial demand is determined. As opposed to the firm, in which this decision is scarcely influenced by the relative prices of inputs (see Chapters 5 and 14), the household is responsive to the relative prices of consumer goods. Let us begin with an abstract situation; the simplifying assumptions will be later gradually lifted. We assume that our housewife expects to find everything she wants to buy for supper in the shop where she intends to go and that she knows the prices. Thus, the decision is affected exclusively by the tastes of the family, by its purse and by prices (that is, by its preference ordering and the budget constraint).⁶

We might mention here that—as long as the household is in *Field E* of the algorithm—the household is behaving in a neoclassical manner.⁷ *It chooses voluntarily, on the basis of price signals.* And since it chooses from among substitutes (sausage, ham, salami, etc.) the decision may be called *voluntary substitution*.

The decision has been taken. Let us assume that our housewife intends to buy a definite amount of product A, say 250 grams of ham. With the shopping list in her hands—that is, with the initial demand—she sets out for her usual foodstore. By doing so she reaches *Field F* in the flow chart, which raises the question of whether product A can be had at the store being visited. If the answer is yes, the housewife has successfully reached the end of her shopping route, *Field G*, which indicates a successful purchase.

The standard microeconomic model stops at this point, because it does not even ask the question raised in *Field F*, whether the product is available. It tacitly assumes that it is always available. In reality, however, this is not self-evident in any system. Even in those systems which face the fewest shortages the consumer will not find everything at the shop first visited; some search or forced substitution will occur. And this applies more so in a shortage economy.

At this point we recall what we said about the measurement of demand in section 5.5. To find out whether the buyer has in fact bought what he wanted, it is not enough for supply to match demand exactly. Only the retention by the seller of stocks of both A and B will prove that the buyer

⁶The model described in Mathematical Appendix A covers the decision problem described in *Field E*.

⁷We represent the household's behavior as a dynamic *process* (or, more exactly, as a sequence of processes consisting of many repeated and interlinked elementary processes). In this process both events that can be explained in a neoclassical manner and events that cannot are interlinked and influence each other.

has indeed made a free decision about the proportions in which he purchases A and B. *Excess supply of each product is the necessary condition for consumer's sovereignty.*

We now revert to the case when the answer to the question in *Field F* is negative: product A cannot be found in the shop first visited. The next dilemma can be seen in *Field H*. Is our buyer willing to make a *forced substitution* immediately in the shop she is in? If yes, she comes to *Field I* where she has to state her *revised demand*. What does she choose from the goods available? Will she abandon her first choice, product A (250 grams of ham) and choose instead a second best from the products B, C, D, etc. which are available? If we ignore the antecedents, this second choice might again seem to be a "neoclassical decision situation", since from the set of alternatives thus narrowed she again determines the revised demand according to her own preferences, taking into account the relative prices, and implements the decisions in *Field J*.

And what if the housewife is not inclined to make a forced substitution immediately so that she enters *Field K*? She can choose: either she *waits* and does not buy anything this evening, but chooses something from her stock for supper. Waiting (*Field L*) will be discussed in the next section. Or, her other possible choice is to start *searching*. This may be illustrated by a cycle in the algorithm. The buyer reverts to *Field F* and starts again from there. And this cycle is repeated until the housewife finds the good she initially demanded or runs out of time, or loses her patience and decides to revise her demand and to make a forced substitution, or perhaps until she puts off her purchase.

It may turn out after repeated searches that there is an absolute shortage in some product group for which no substitute exists for the group as a whole. Whatever forced substitution the buyer makes, within meat products, for example, it can happen that even the total meat supply will not satisfy demand. This is obviously a shortage phenomenon of much greater consequence than a *relative* shortage which may be more or less compensated for by forced substitution.

Even in the case of absolute shortage the question arises of what the household should do with the money intended to purchase the missing product. This leads us to the subject of the next section.

18.4. Monetary reflection of the process: Forced spending or unspent money

The diagram is continued in fig. 18.3 in which the final event in the previous diagram again appears in the upper left-hand corner. *Field L* indicates passive waiting without any specified purpose; the buyer has put

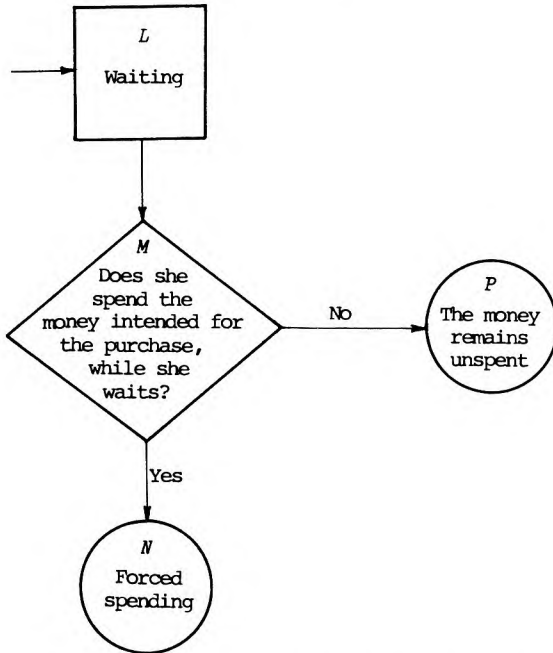


Figure 18.3. Forced spending and unspent money.

off a decision.⁸ Maybe, after some time she will try again to act on her original initial demand. She may change her mind.

The question illustrated by *Field M* is: what happens to the money destined for the purchase of the desired commodity while she is waiting? The two possibilities are *Field N*, *forced spending* and *Field P*, which represents the case when the money remains unspent.

Theoretical considerations prompt us to distinguish forced *substitution* and forced *spending*. We do not accept the proposition in utility theory that every consumer good or service which has a positive marginal utility for the consumer is a substitute for another in a broad sense. That would mean that even if we consume less of product A, the value of the utility function can remain unchanged if we compensate this loss with additional consumption of any other product B which has a positive marginal utility. Our own view gives much greater importance to the fact that the main

⁸A special case of waiting is *queuing*. (See sections 4.5 and 17.7.) This is not shown in the figures in the present chapter.

groups of consumer goods are complementary. If we lag behind significantly in one group, this impairs the satisfaction brought about by the other groups.

Those who advocate the principle of “general substitutability” at the level of pure theory would perhaps feel ashamed if they knew that their argument coincides perfectly with the reasoning of those who are trying to cover up the troubles on the market for consumer goods in the shortage economy. Their usual reasoning runs as follows: true, there are troubles in meat supply—but every family has a television set. There is a shortage of flats, but there is an abundance of clothing on offer in the shops. In fact, eliminating a shortage in one product group does not compensate for the losses suffered through shortages in some other product group.

We do not aim at drawing a sharp dividing line. In themselves, the two categories—forced substitution and forced spending—seem to be logically clear, and many events can be unambiguously classified into one or other category. If—to continue the previous example—our housewife buys sausage instead of ham, this is forced *substitution*. If she leaves the shop empty-handed and, on the way home, she buys a toy for her child instead of the ham for which the money was intended, this is forced *spending*. Forced substitution immediately fills a gap, while forced spending leaves a gap behind, the unsatisfied demand for meat in our example. There are certainly borderline cases,⁹ but we need not treat them in the framework of our theoretical analysis.

Forced spending is expenditure on goods other than those initially intended; it is occasioned precisely by frustration of the initial intention. We do not specify a strict time unit between the formulation of the original intention and the performance of the substitute activity for the latter still to be considered as the continuation of the former. It might be an hour, a day, or a year depending on the nature and the value of the product initially demanded. The frustrated purchase of supper is immediately followed by forced spending. But if someone, because of shortage, completely abandons the idea of acquiring some more expensive consumer durable, then he may hesitate for a longer time before deciding what to spend his remaining money on.

We emphasize three reasons for forced spending.

(1) *Consumer impatience.* Many consumers feel that even if they have not got what they wanted, they have bought *something*. “Let us spend the money on anything that gives enjoyment or satisfaction.”

⁹Using the Lancaster model of consumer behavior we could give a more accurate description of how different products are substitutes for one another in one or in several attributes. See Lancaster (1957, 1966).

(2) *Consumer “maneuvering”*. An alert buyer in a shortage economy does not buy when he actually needs the commodity, but when it is available. He may buy a good months before it is needed. In fact, he will even accumulate a safety margin since the commodity in question may perhaps not be available later on. This corresponds in the household sphere to what in the firm sector we called “hoarding”,¹⁰ with the difference that the household’s financial possibilities for hoarding are more limited.

Thus, if the housewife does not get what she initially intended to buy in the foodstore nor even a near substitute, she still looks around to see what is available. And if she finds something interesting, she buys it – even if it is quite different from what she initially intended to buy.

(3) *Inflationary expectations*. The more the consumer is afraid that the value of money will depreciate, the more he hurries to spend his money. Of course, the strength of this motive depends on the rate of inflation (or, more precisely, on the difference between this inflation rate and the interest rate on bank deposits). With a slow, creeping rise in prices nobody will run to spend his money. But even under such conditions, fears of inflation may encourage spending.

When does the consumer move into *Field P*; that is, when does the money remain unspent – in spite of the three reasons above? We stress four explanations which may appear either separately, or together reinforcing one another.

(a) *Friction*. The buyer adjusts to supply slowly, and with difficulty. Though he is aware that he cannot spend his money in the manner intended, it still takes some time before he searches for a new spending outlet. The inertia of purchasers diminishes forced spending.

(b) The more intensive the shortage over a wide range of goods and services, the more difficult it is to find the commodity to buy. And this is related to (a) above; in particular a more conservative or inert buyer is more reluctant to embark on forced spending.

Even though it may not be possible to distinguish them through quantitative observation, the following phenomenon (c) should at least theoretically be separated from cases (a) and (b).

(c) Depending on how intense and how general shortages are in the consumer goods market a buyer may find that his money is *unspendable*. *If shortages are very intense in many individual markets, and if, furthermore, the shortages and perhaps administrative regulations too make it impossible to*

¹⁰See Section 5.6.

spend savings on costly durables, such as cars, travel, or the building of condominium flats or private houses, then some of the money accumulated in the household will become unspendable in the narrow sense of the word. This is the extreme form of forced saving caused by shortage.

In the last ten or fifteen years this phenomenon has hardly been experienced in Hungary. In the wake of the reform of economic management, and as the rate of growth has moderated, the normal state of the market has altered. There are shortages, but their intensity has diminished in several fields of consumption. The supply of consumer goods is wider. Money can be spent on such things as tourism, the building of condominium flats or homes, and so on. Although there is still considerable suction on the consumer goods market and forced substitution and forced spending are frequent occurrences, the consumer can almost always find a commodity to serve as a forced substitute or as an outlet for forced spending. (The Press usually characterizes this state of affairs with the observation that there is no general shortage, only a partial one.) Therefore, the appearance of forced saving in the form of *unspendable* money is not a characteristic of the present-day Hungarian market for consumer goods.

(d) The money perhaps remains unspent because—independently of the shopping process just outlined—the consumer has a strong wish to save. Therefore, he strictly refuses to undertake any unplanned expenditure. Thus, if a specific purchasing intention fails, he adds the remaining money to his stock. This phenomenon is closely related to another one. Waiting and queuing frequently involve or even require that liquidity be maintained. The formation of monetary reserves will be discussed in detail in the next section. We only note here that up to now we have only given half of the explanation of how the household reaches *Field P*. We have highlighted the “negative” reason: it goes there because it does *not* go to *Field N* and undertake forced spending. The positive motives will be explained in the next section.

Summing up, we may state that shortage *may* result in money remaining unspent, but it does not *necessarily* entail this.

18.5. Motives for household saving

Our explanation of why money is not spent must start with a conceptual clarification. The expression “saving” is used in many senses. We use the following definition: saving in any period is the difference between the

stock of money held by some economic unit at the beginning and at the end of the period.¹¹ Saving is thus the increase in the stock of money over the period.¹²

The question to which we now seek an answer is the following. What *motives* prompt households in a socialist economy to hold and accumulate money and to save?¹³ We do not seek to give a full answer but we only list a few important motives.

(1) *Transactions motive*. Money flows into the households with interruptions. The times when it arrives may differ from the times when payments are due. To bridge the gaps, a stock of money is needed. In itself, this is trivially true; the transactions motive operates in any monetary economy. But the special feature added in a shortage economy is the protraction of transactions because of search and waiting. This may work towards increasing money holdings.

(2) *Voluntary prior saving*. With rising living standards the consumption of expensive consumer durables or services becomes more important. First refrigerators, TV sets, and washing machines are acquired; later money is spent on cars and travel abroad. These are large indivisible items of expenditure, few of which can be bought by installments,* most of which have to be paid for in cash. Thus, the purchase price has to be saved in advance. In several socialist countries the share of private financing in total residential construction is increasing. Only a minority of the costs of housing construction is financed with bank credit, much of it has to be covered through prior saving. We do not mean here only the savings of the future owner of the flat, but also those of parents and other relatives.

Motive 2 is related to shortage, but only indirectly. In systems where the seller finds it difficult to make a sale, he tries to facilitate and stimulate purchases through hire-purchase and other forms of consumer credit. The

¹¹We mean *net* "stock of money" which is interpreted as stock of cash + stock of claims – stock of debts. It is assumed that the terminal stock is no smaller than the initial one, i.e. the difference is non-negative. Insofar as the terminal stock is smaller than the initial one, dissaving has taken place.

¹²Three interpretations of the word "saving" have become widespread. (1) The *total* stock of money of some economic unit *at some date*. (2) The *increment* in the net stock of money over some period, and (3) the (positive) difference between planned and actual expenditure in some period. We use the second interpretation, without entering into a conceptual debate about the justification of the other two interpretations.

¹³The classical analysis of the motives for savings in a capitalist economy may be found in Keynes (1936a, b, ch. 9).

To explain household savings in a socialist economy I used the research results of Lackó (1975, 1976).

*We should remind the reader that this discussion applies to savings in socialist countries. The situation would be different in the developed capitalist countries. (*Editor's note*.)

low level of consumer credit in the shortage economy reflects the fact that selling is not a problem here. The household will often be willing to make the great sacrifices involved by prior saving to obtain the desired product or service at all. The ratio of consumer credit to total sales is a fairly reliable indirect indicator of how great selling difficulties are, and of how intense the shortage is.

Saving motive 2 links up three explanatory factors: Engel's law (an increase in the share of expenditure on expensive durables as total consumption increases); the increasing share of market schemes in distribution (especially as more dwellings are built from the individual's own resources); and finally shortage. In connection with Motive 2 we should also like to stress that a household saving for a car or a flat does not set money aside because it is unspendable, but precisely because – after a long wait – a highly attractive spending opportunity may be available.

(3) *Mandatory prior saving*. There are combined allocation schemes which require the buyer to deposit a part or the whole of the purchase price in advance in order to be able to enter the queue or to put in a claim. This is the situation in most socialist countries in the case of queuing for a car.

What has been said above about motive 2 also applies to this motive. Obviously, this is not a case of "unspendable" money appearing as saving – although the phenomenon is closely related to shortage. Precisely because these are queues for shortage goods, buyers can be forced to pay part of the purchase price in advance.

(4) *Purchaser alertness*. We mentioned above in the discussion of forced spending that in a shortage economy an alert buyer purchases not when he wants to consume a good but when the good is available. It is usual to say that every member of the household is recommended to carry a shopping bag in case he finds something worth buying. If he sees a queue, he should join it just to be safe – he can ask later what is being allocated. If so many people want the good, he will certainly want it too.

But, someone acting in this alert way needs not only a bag and a good eye, but money as well. Once he has joined the queue he has to pay, when his turn comes. Households differ from one another in the number of markets for which they are in a "state of alertness". Someone keeping an eye open only for food or other inexpensive consumer goods need hold only a small liquid monetary reserve. Someone hunting for more valuable durables – a tape recorder, record player or other household equipment – has to accumulate a much larger monetary reserve in order to be able to take up any available opportunity. And once the household has decided to

buy an apartment, a plot of land or a weekend home for cash, it has to hold very large sums in order not to miss a favorable opportunity.

It is precisely with major items that supply is capricious and intermittent, and the market unpredictable. Of course, this is just a reflection of shortage. To this extent, also the saving done for motive 4 is produced by shortage. The less stable and predictable supply is, the more household is forced to accumulate money reserves the size of which depends on its aspiration level. But even here, the money is not unspendable; only the appropriate moment is not known.

(5) *Precautionary motive.* This motive appears in every system. People put aside money for their old age, or for unexpected expenditures caused by accident, illness, or unforeseen difficulties. True, sick-pay, pensions and so on are guaranteed by the state. But their size does not keep pace with the growing expectations of much of the population or with the living standards they wish to maintain in illness or retirement. In fact, private insurance is available too, but the alternatives offered may not be sufficiently varied or attractive. At any rate, many people arrange to insure themselves on their own account against the contingencies mentioned.¹⁴

For a long time it seemed self-evident that the households form a safety reserve in the form of a stock of *money*. As incomes generally increase, however, the strata with higher income increasingly accumulate safety reserves in the form of real goods, such as jewelry, works of art, weekend homes, etc. In this way they meet several purposes simultaneously.

(a) As long as the goods in question are in their possession, they enjoy their use, while money would yield no benefit.

(b) In case of need, the goods mentioned, or others similar, can easily be sold. This means that they can fulfill the role of a safety reserve.

(c) These goods preserve their value better than money, which may be threatened by creeping or even accelerating inflation. We have already mentioned inflationary expectations as a motive for spending. We may now add that anyone who considers the question thoroughly will not spend his money but invest it in goods whose value is maintained or even increases. Thus, the speculative motive, which will soon be dealt with separately as motive 6, is already present. In addition, this kind of value-preserving and increasing function is self-fulfilling. The greater the number of people who recognize this property of some real goods, the more demand for them will increase; and at a much faster rate than their

¹⁴Under capitalism fear of unemployment also encourages people to build up precautionary balances. This motive does not apply in a socialist economy which operates under conditions of guaranteed full employment.

supply can grow. It is well known that land, privately owned family and weekend homes, and works of art go up in price much faster than the general price index.

In a socialist society there is not a wide range of opportunities for investing money; there are no bonds or shares. In practice, the precautionary reserve of households can take two forms: either a financial stock (cash or savings deposit) or real assets which can be quickly sold, and which may even go up in value. Since the latter are not completely liquid—even if their sale is not particularly difficult—households save in both ways according to their liquidity preference.¹⁵ The past and future growth rates in the two kinds of reserve should be clarified by empirical studies.

(6) *The speculative motive.* The legal rate of bank interest at most induces people not to let the money stand idle at home, but to start a savings account. As far as we know, the bank interest as a source of income does not encourage anyone to save.

Sometimes we hear of private persons who lend money at an interest rate higher than the bank, but this seems to be rather rare.

If the speculative motive affects savings at all, this happens mostly in the form mentioned under (5). Anyone wanting his money to yield a profit, invests it in real assets such as land or a weekend home.

We may draw the following overall conclusion. On an abstract level we can distinguish forced saving caused by shortage from voluntary saving which is independent of shortage. Unless shortage is very intense, the fact that money is unspendable plays a relatively small role in forced saving brought about by shortage. The indirect effects of shortage operating through motives 2, 3, and 4, play a much greater role.

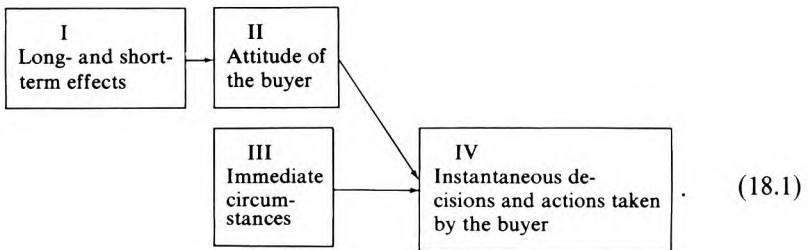
In reality a Forint saved is not labelled by the motive for saving it. In addition the motives are frequently interlinked. For example, parents may be saving money for their old age (motive 5: precautionary reserve), but they lend it temporarily to their son when he is queuing for a car (motive 3: administratively prescribed prior saving). Both reasons operate simultaneously. The distinction between voluntary saving and that induced by shortage is an abstraction which makes a theoretical survey of the problem easier, but it is not certain that they can also be separated quantitatively by observation and measurement in practice.

¹⁵From the point of view of liquidity, in Hungary there are no important differences between the various forms of saving deposits for private individuals. There are spot deposits, with a rate of interest of 2 percent, and time deposits (for one year) with 5 percent interest. The latter may also be withdrawn without notice, though the holder of a deposit loses the interest on any amount withdrawn within one year.

18.6. The buyer's attitude

When speaking about the savings of the household we have already left the approach of sections 18.2–18.4. There we described the sequence of submicro-level elementary events, the *instantaneous* adjustment of the buyer in the course of a single shopping process, while in the case of savings we began to examine continuous features in the behavior of the household, its *short- and long-term adjustment*. Let us proceed further along this road. We next examine *permanent elements affecting the demand of the buyer, or, more generally, the buyer's attitude*. This topic has already been analyzed in detail in Chapters 4, 5, 7, and 14 in the case of the firm. Space limitations prevent us from applying the ideas expounded there to the case of the household, item by item, with the necessary modifications. We have to be satisfied with presenting a few ideas only.

The logical scheme of the interrelations explaining the household's behavior is summed up in formula (18.1):



The arrows show the direction of cause and effect. Let us proceed backwards. *Field IV* comprises those decisions and actions which we have described in the shopping algorithm. These decisions and actions are taken as a result of two groups of factors. One is the effect of immediate circumstances (*Field III* → *Field IV*). The following variables may be listed here as examples: prevailing prices; the buyer's direct experience of and information about supply in the recent past and at that instant; the length of the queue at the shop; expected queuing time; and so forth.

The other group of factors which affects the instantaneous decisions and actions of the buyer consists of his own nature, the permanent features of his behavior which may be summed up as his attitude (*Field II* → *Field IV*). This includes *his regular patterns of behavior, norms and limits of tolerance, routines for taking decisions and acting, rules of thumb, and the parameters which characterize his behavior*. Without claiming completeness, we list here a few of the components of a buyer's attitude.

(1) In the case of parallel allocation, his propensity to use different allocation schemes.

(2) His voluntary substitution propensity and initial demand function.

(3) His forced substitution propensity and revised demand function.

(4) His search propensity.

(5) His waiting propensity.

(6) His queuing propensity.

(7) His forced spending propensity.

(8) His saving propensity.

(9) Parameters describing the efforts he makes at winning over the seller.

The reader may trace the correspondence between the components of attitude and the steps in the shopping algorithm.

The buyer's propensity to queue, to make forced substitution and indeed any other component of his attitude, may fluctuate from moment to moment. If, however, we observe many buyers making repeated purchases on many occasions, we can identify definite stochastic behavioral rules. Perhaps we can establish the probability distribution of the random variables determining attitudes. Or at least we may state the average behavioral characteristic over some longer period for different subpopulations of buyers.¹⁶

The average attitude of the population of households¹⁷ is shaped by many factors working both in the long run and the short run. This effect is symbolized in the diagram by the effect of *Field I* on *Field II*. Again, without claiming completeness, we cursorily mention a few of the factors with a long-term effect.

(a) *The social position of the household*; the class, stratum or group of society to which it belongs. This includes its usual money income, the occupation, educational level, sex, age of the members of the household, its place of residence (large or small town, village), and so on. Standard microeconomics stresses money income. This is, of course, an extremely important determinant of consumption, but it can be empirically proven

¹⁶*Fields II, III and IV* and the relations between them may be modelled in many ways. We do not go into the details of this problem here. A possible formalization of the buyer's attitude and of its relationship with instantaneous actions can be found in Mathematical Appendix A.

¹⁷The word "population" may indicate here either all buyers, or some relatively homogeneous group of them. In the latter case, the relationship between *Field I* (lasting effects) and *Field II* (attitude) can be clarified by analysis of separate groups (subpopulations). A more disaggregated exploration of the relationship between I and II naturally yields a richer explanation of the factors which shape permanent features in buyers' behavior.

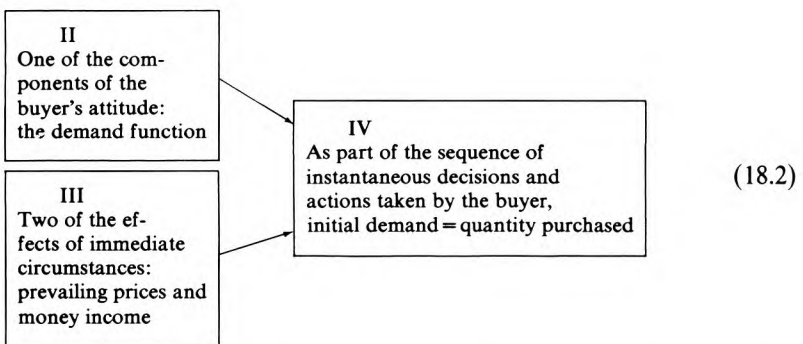
that the consumption habits of two households with the same money income can deviate substantially depending on the factors listed, and on others not mentioned at all.

(b) *The usual composition of supply.* It is only useful to consider the demand and the supply functions as independent in the models of instantaneous adjustment. In reality, *in the long run demand is mainly a function of supply.* The demands of people are shaped by the products and services made available to them by producers.

(c) *The normal state of the market.* Let us restrict ourselves here to a suction economy. If occasional forced substitution is repeated frequently, it sooner or later becomes a habit. As in (b) we mentioned that in the long term new products make consumers *accustomed to new goods* so now in (c) we stress that shortage makes consumers *unaccustomed to old goods*. So in this respect too demand is a function of supply in the long run.

(d) *Normal relative prices of consumer goods.* In practice, in socialist countries the consumer prices of certain goods and services are fixed at a low level by government subsidies or tax exemptions, while those of others are kept high through higher than average tax rates. Prices of consumer goods will be discussed in greater detail in the next chapter. Here we wish to stress only that permanent relative prices have an important influence on consumer habits, which do not change easily even if relative prices should change for an instant from their permanent proportions.

Formula (18.1) and its explanation gives only an extremely brief sketch of the theory of household behavior. But it makes clear the similarities and differences between this approach and the standard microeconomic model of the household. To make the comparison easier, we can formulate the neoclassical model diagrammatically in a manner similar to formula (18.1).¹⁸



¹⁸The reformulation is – unfortunately and unavoidably – rather arbitrary. Standard microeconomics usually does not clarify whether its categories (demand, price, income) are

Field IV singles out *Field E* in our multistage shopping algorithm. This is the elementary event when initial demand is determined; in section 18.3 we noted that here the buyer behaves for a moment in a neoclassical manner. The model assumes that from here the buyer moves immediately to *Field G*, that is he transacts the purchase, since there can be no obstacle to it from the supply side.

As far as the explanation of the event goes, in *Field II* we find only a single component of the many that comprise the buyer's attitude, namely the demand function. And in *Field III*, again, of the immediate circumstances influencing the consumer's choice, only two kinds of variables, prices and money income, are identified.

Finally, perhaps the most important difference is that *Field I* is absent, as is its interrelation with *Field II*. In other words the effects of the short- and long-term factors which shape the attitude of the household are left out of the scope of the model.¹⁹

18.7. Indicators of shortages in the consumer goods sector

The principles of observation and measurement set out earlier in the book are also applicable to the measurement of shortage phenomena in the consumer goods sector. There is no need to review them in detail here. We wish to call attention again only to the principle of *aggregation*.

A full description of the situation would require a million figures, but compiling them would be too costly and the result could not be summarized. Our measurements, therefore, must be "condensed". We need not be averse to partial aggregation. We should, however, beware of aggregation which nets out values with opposite signs. If there is shortage on even dates and slack on odd ones, we should not state that on average there is equilibrium over time.

Table 18.1 illustrates the kinds of indicators which could be used to characterize shortage phenomena in the consumer goods sector. We do not

variables in instantaneous, short-term or long-term adjustment; it does not explicitly state the assumption that there is no supply constraint on satisfying demand, and so on. Thus, to make formula (18.2) comparable to (18.1) we have had to introduce arbitrary additional assumptions.

¹⁹Our ideas here are closely related to the thoughts on preference ordering expounded in *Anti-Equilibrium* (Kornai, 1971a, b, chs. 10 and 11).

Our views agree at several points – even if our terminology is different – with those of other authors. See, for example, Hoch (1962, 1972, 1979), Hoffmann (1977), Andersson (1978), and Shackle (1972).

Table 18.1
Shortage indicators of the consumer goods sector.

General phenomenon	Particular phenomenon	Nature of the indicator
1. Shortage of products allocated by administrative rationing	1.1 Shortage of officially allocated flats	Number of people in the queue Extent of waiting time Forced substitution (Difference between the flat wanted and the flat allocated)
	1.2 Shortages in childcare and educational institutions	Number of applicants refused Indicators of the burden imposed on the staff Indicators of crowding in buildings and rooms
	1.3 Shortages in the health service	Time spent in doctors' waiting rooms Queuing time (in queues with serial numbers) Indicators of the crowding in buildings and rooms
	1.4 Shortage of telephones	Number of those waiting for telephones to be installed, and waiting time Indicators of the overloading of the network
2. Shortage of products allocated by the market	2.1 Absolute shortages: unsatisfied demand for whole product groups for which no substitutes exist	Extent of the shortage Frequency of the shortage Distribution of the shortage over time and space
	2.2 Shortage of spare parts	Frequency Distribution over time and space Losses measured by down time of machinery
	2.3 Forced substitution Consumers' losses due to forced substitution	Classified by the closeness of substitution Frequency Distribution Objectively measurable losses The subjective feeling of loss of the consumer, expressed in money terms

Table 18.1 (continued)

	2.4 Searching	Number of shops visited before a successful purchase Time spent searching
	2.5 Waiting, queuing	Time spent queuing physically Length of the physical queue Time spent in queuing with serial numbers Length of the queue with serial numbers Uneven stocking of commodities; the time between arrivals of shipments
3. Indicators which signal the shortage indirectly	3.1 Relative prices of the products distributed through administrative rationing and by the market	
	3.2 Black and "grey" markets	Volume of transactions on the black and "grey" markets Relative prices of legal, semi-legal and illegal transactions
	3.3 Total time spent on buying	
	3.4 Efforts made by the seller to win over the buyer	Advertising Packaging Home delivery
	3.5 Effort made by buyers to win over the seller	Proliferation of tipping
	3.6 Consumer credit, hire-purchase	
	3.7 Stocks of consumer goods at the sale point	
	3.8 Growth of household saving	Classification according to causes and motivation

Table 18.1 (continued)

General phenomenon	Particular phenomenon	Nature of the indicator
4. Effect of the shortage on the general opinions of the population	4.1 Dynamic observations: changes in public opinion over time	
	4.2 Comparison with aspirations and expectations	
	4.3 Ranking of different shortage phenomena, by the degree of dissatisfaction felt with them	

touch upon the practical problems of observation and measurement. The table mostly speaks for itself, only a short commentary is necessary.

1. *On services allocated by administrative rationing.* We remind readers of the notion explained in Chapter 12. As capacity is heavily utilized, marginal social costs are rising steeply. This can partly be quantified using the indicators mentioned here or similar ones.

2.3. *Consumer's loss due to forced substitution.* In the course of an interview we may ask a consumer, who has substituted B for the missing product A, what amount he would have paid in excess of the price of B in order to get A. If the answer is reliable, it expresses the "consumer's loss" resulting from the forced substitution.²⁰ Although the reliability of individual answers may be doubtful, interviewing many persons may throw some light on the subjective costs of forced substitution.

2.4 and 2.5. *Search, waiting, queuing.* Numerous – though sporadic – observations are made of how many shops a buyer must visit before purchase can take place and how much time is spent waiting and in queues.²¹

3. *Indirect indicators.* These do not measure the shortage itself but its consequences or accompanying phenomena.

3.2. *Black and "grey" markets.* The extent of these and prices charged in them depend first on how intense the shortage is and secondly on how rigorously the illegal or semilegal activities are persecuted by authorities and by society. Massive occurrence and high prices may allow us to

²⁰The concept of consumer's loss (negative consumer's surplus) was explained in Chapter 17.

²¹On the consumer's loss caused by searching, waiting and queuing see the article by Pryor (1977). One of the main sources of the data in Pryor is Szalai (1972).

conclude that shortage is intense. High prices and relatively infrequent occurrence may perhaps also mean that the price is forced up by the risk of severe punishment.

3.4, 3.5, and 3.6. *Relative market power.* The indicators listed show indirectly whether the seller or the buyer is in a more powerful position.

3.7. *Stocks of consumer goods.* In Chapters 6 and 8 we emphasized that only cautious conclusions concerning the state of the market can be drawn from the growth of stocks of finished goods. Changes in unproductive stocks do not immediately affect the consumer. Only increases in productive stocks directly imply that shortage is diminishing, and conversely.

3.8. *Household savings.* The financial data must be complemented by interviews which attempt to clarify the causes and motives of saving. (See sections 18.4 and 18.5 as well as 18.10.) Only thus can it be established to what extent the growth of savings is related to changes in the intensity of shortage.

4. *Public opinion.* The groups of indicators 1–3 describe the intensity of the shortage. We use the indicators in group 4 to show how the given degree of shortage affects the mood and the opinions of the population.²² Sociologists, social psychologists and public opinion researchers have worked out several ways of getting a fairly reliable picture of the subjective reactions of the population, and the extent of their satisfaction or dissatisfaction.

Although table 18.1 is merely illustrative, it suggests that *shortage in the consumer goods sector is observable and measurable.*²³ Maybe this is very hard to do and the result will certainly not be precise. Yet such efforts may illuminate highly important phenomena. It is deplorable that *no general and regular attempts have been made to observe and measure the shortage phenomena in a statistically comparable way.* At most scattered data are available. This causes great difficulties in theoretical analysis. Moreover, it deprives economic policy of an important support. This is a grave deficiency in our knowledge of different social systems, including the socialist societies.

On several occasions over the last decade since the reform, the Hungarian Press has stated that “the equilibrium position on the consumer

²²The article by Dániel (1977a) called attention to the need to observe *both objective and subjective aspects* of different socioeconomic processes in parallel, as interrelated factors. In other words the phenomena themselves must be observed as well as their reflection in people’s mood.

²³On the measurement of shortage on the market of consumer goods see the articles by Pálos-Pintér (1978) and Radnóti (1978).

market has improved".²⁴ This expression is presumably intended to indicate that many shortage phenomena today operate at a lower level of intensity and some of them have even disappeared. According to the author's impression this statement is justified. Unfortunately, however, in the absence of comprehensive, regular and comparable observations and measurements, this remains only an impression, which cannot be strictly verified.

18.8. The price of consumer goods and the intensity of shortage: First approach

What has been said about the behavior of the household allows us now to examine consumption from another standpoint. We have touched upon the effect of price at several points and we now concentrate on that. When reviewing the buyer's algorithm we have described events at the *submicro-level*, including how the consumer determines his initial demand by weighing the relative prices as he progresses to *Field E*. Now we examine the relationship between price and shortage on a more *aggregated* level.

Our starting point is the oft-mentioned fact that the household faces a hard budget constraint. Accordingly, it reacts to price changes in a way well known from consumption theory: *demand is a decreasing function of price*.

Although this basic relationship holds and has been analyzed in detail in the literature,²⁵ we cannot be satisfied with this statement alone. We are dealing with a market where various shortage phenomena frequently appear. Fig. 18.4 illustrates the relationship between the intensity of shortage and price. In constructing the figure, we started from the following assumptions.²⁶

(1) We examine a particular market covering *a group* of consumer goods. The various products within the group are substitutes for one another, more or less. The group comprising meat and meat products might be an example.

(2) We describe the behavior of the market over some longer period, say a year. Over the whole period we perform a *comparative static* analysis.

²⁴This expression itself has already been discussed in section 7.9.

²⁵See Hicks (1939a, b) or from the textbook literature, Samuelson (1948a, b), Henderson-Quandt (1958), Green (1976).

²⁶The assumptions here are somewhat different from those used in the description of the shopping algorithm and listed in section 18.1.

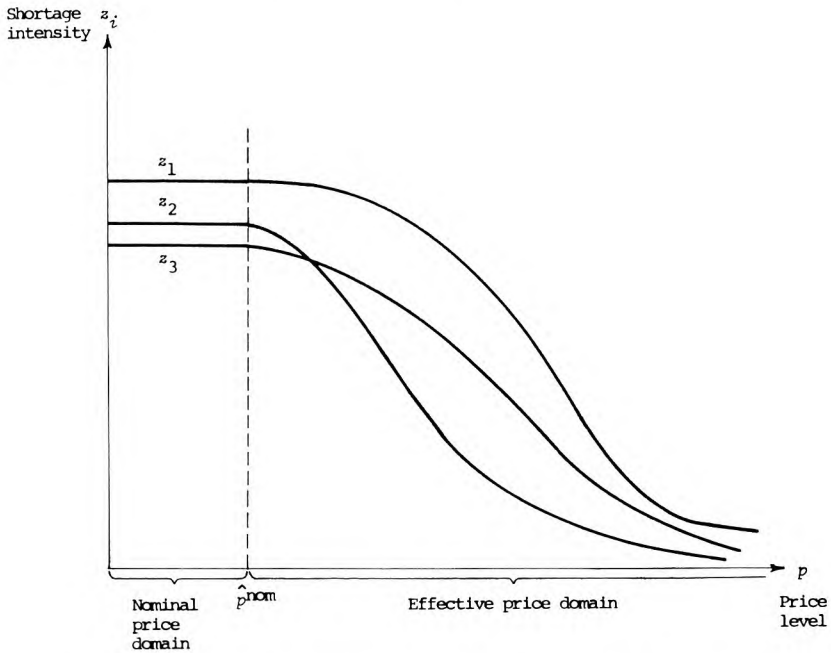


Figure 18.4. Relationship between the price of consumer goods and shortage.

(3) The initial stocks of the sellers are given, as are deliveries over the period observed. We examine only how buyers respond to price changes, not how sellers do.

(4) Supply is reserved for household and cannot be purchased by other sectors of the economy.

(5) The budget constraint of the households (their initial stock of money and the money income they receive during the period observed) is given. So is the total amount they intend to spend altogether on the particular market to be examined.

(6) The initial demand of the households is given – at given prices and nominal income.

(7) The frictions affecting adjustment in the market are given.²⁷ These are the result of uncertainty of buyers in formulating their own intentions, their lack of information about the distribution of supply over time and

²⁷Friction was discussed in Chapter 8. We introduced the vector of indicators, w , to measure it in section 8.7.

space, the lack of information of sellers about the intentions of buyers, and so on.

(8) The prices of all other consumer goods and services not traded on the particular market examined are given.

(9) Relative prices within the product group are given. The price of every product belonging in the group is uniformly multiplied by a positive price factor, denoted by p . A rise or fall in p raises or lowers the price of every product within the group relative to the prices of products outside the group. Therefore, p is called the *price level* of the group of products.

Assumptions (3)–(9) together mean that we are examining the effect of changes in price level p , *ceteris paribus*.

(10) Shortage is described by the set of indicators z_1, z_2, \dots ; these have been discussed in detail in the preceding section. Three of them are shown in fig. 18.4. Since the figure is for illustrative purposes only, we do not specify which indicators are shown.

Let us now examine the properties of the functions $z_i = z_i(p)$ in the figure.

The price axis can be divided into two domains. We recall from section 17.2 that if the price is smaller than the critical value \hat{p}^{nom} , the households do not respond to the price. In the domain of *nominal prices* the shortage indicators take a particular level, shown in the figure by the horizontal lines. They are horizontal because they do not depend on the price provided it is below the critical value \hat{p}^{nom} .

If, however, the price level enters the domain of *effective prices*, then each successive price increase deters new buyers from buying. We are dealing here with a complex stochastic phenomenon which we illustrate by continuing an example mentioned above. Let us assume that at price p_1 40 housewives out of 100 wish to buy ham, but the demand of only 10 can be satisfied. Supplies are distributed among the different shops in a random manner and housewives visit the shops in a random manner. Each of them has a probability of $1/4$ of getting some ham. Let us assume that all those who cannot get it, make a forced substitution. Thus, the proportion who may be expected to make such a substitution is 0.75. Let this be one of our shortage indicators. If now, at price p_2 ($p_2 > p_1$) 10 of the 40 voluntarily renounce their intention of buying ham, the others have a $1/3$ probability of making a successful purchase. The expected proportion making a forced substitution will then fall to 0.67.

The length of the queue shortens likewise, if there are queues; waiting time is reduced, and so on.²⁸ In the final analysis the *intensity of shortage is a decreasing function of the price level*.

²⁸For a more detailed exposition see Mathematical Appendix A.

We may ask why the functions z_i in fig. 18.4 do not touch the horizontal axis. Can no price level p be found at which the shortage might be completely eliminated?

To answer the question we introduce fig. 18.5. We select one from the three shortage indicators of the preceding figure and now call it, in a general notation, indicator z_i . But now we draw not one but three functions of the indicator.

We have to modify several of the assumptions underlying fig. 18.4, namely assumptions (3), (6), (7) and (9). We wish to take account of the fact that during the period of observation supply, demand and relative prices may adjust to one another with more or less friction. The vector of indicators describing the extent of friction, w , now includes not only nonprice variables, but also frictions affecting adjustment of relative prices. Apart from this, its interpretation is the same as in Chapter 8 so that $w = 0$ represents an adjustment with no friction at all.

As regards assumption (3), we continue to assume that the total supply available in the period observed, measured at base period prices, for example, is given. Only the product mix within overall supply may change in the course of adjustment.

The horizontal axis in fig. 18.5 continues to represent the price level of the product group, while on the vertical axis the value of the i th shortage indicator is plotted. We perceive three iso-friction curves. The lowest is

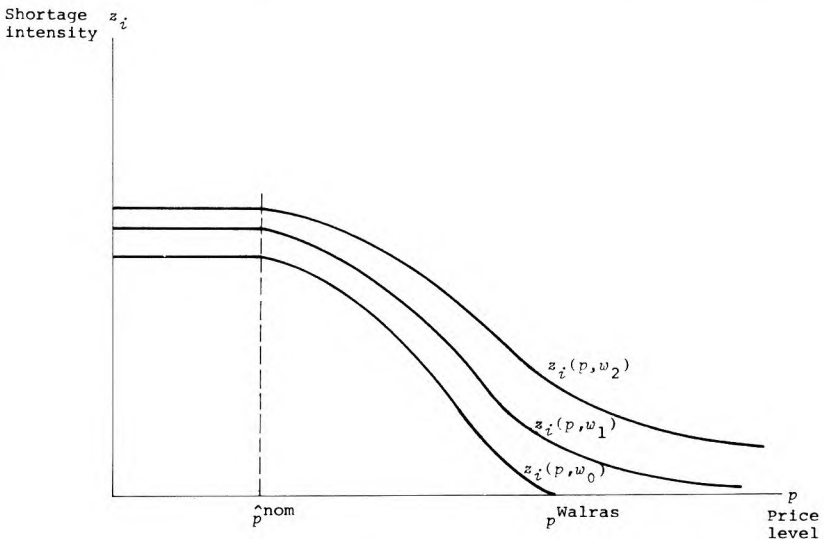


Figure 18.5. Triple relationship between shortage, friction, and the price level.

valid if adjustment is perfect: $w=0$. Demand, supply and relative prices adjust to each other perfectly, without any lag. This curve touches the horizontal axis indicating that the shortage can be completely eliminated. The price level corresponding to this point is denoted by p^{Walras} . This is the Walrasian equilibrium price level of the particular market examined, at which shortage is completely eliminated.

In reality, however, adjustment is never free from frictions. Supply, demand and relative prices adjust with a time lag caused by inertia, by the vacillation of decision-makers, and by agents' uncertainty over one another's decisions. Therefore, shortage phenomena necessarily appear in any actual market. The value of the indicator w_1 symbolizes a market which adjusts fairly, but not perfectly, and w_2 one where adjustment is worse. In neither case can we find a reasonable price level p at which all shortage phenomena are completely eliminated, for every buyer on the market in question and at every moment. This is why the functions $z_i(p, w_1)$ and $z_i(p, w_2)$ do not touch the horizontal axis.

How can the shortage be reduced, holding everything else, and particularly total supply and nominal household income constant? Our answer will be formulated with the aid of fig. 18.6 which repeats part of fig. 18.5: it selects two iso-friction curves, or rather a section of them. The intense

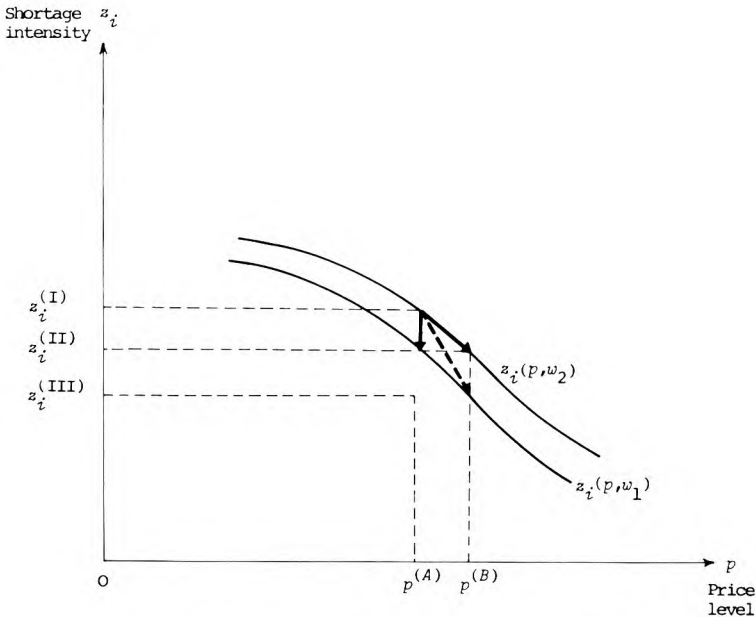


Figure 18.6. Alternative ways for easing the shortage.

shortage is symbolized by the value $z_i^{(I)}$ of the indicator. From this point we may reach a state of less intense shortage $z_i^{(II)}$ in two ways. We can resign ourselves to the fact that adjustment will not improve; in other words *we proceed down the iso-friction curve corresponding to the friction indicator w_2* . But in this case the price level must be raised from $p^{(A)}$ to $p^{(B)}$. Alternatively, we do not change the price level $p^{(A)}$, but improve the adjustment of supply, demand and relative prices to one another; in other words, *we jump from the iso-friction curve corresponding to w_2 to that corresponding to w_1* . If we make both changes simultaneously, the intensity of the shortage will fall further to level $z_i^{(III)}$.

If we succeed in jumping from the curve corresponding to w_2 to that corresponding to w_1 , this is a “net gain” for the buyer. His service has improved without a price increase. There is less queuing, forced substitution is less frequent and less serious and because there is less uncertainty, the information which the parties have about the market improves, inertia is smaller and so is the time lag for adjustment. But however desirable this type of change is, it cannot simply be decided. Several institutional and organizational conditions must be met if frictions in the adjustment process are to diminish. As against that, a rise in prices (that is, a movement along the curve in the figure) can be implemented by a single decision. This too reduces the shortage, but at the cost of sacrifices, since it drives some buyers from the market.

Thus, there is a trade-off between raising the consumer price level and reducing friction. A reduction in the intensity of shortage may be attained in either way – although it is true that the methods have different consequences.

In conclusion, we once again draw attention to the assumption of *ceteris paribus*. The question we asked (“how can the intensity of the shortage be diminished?”) is too comprehensive and general, and the answer we have given with the help of fig. 18.6 is true only on very special conditions. It is only valid if all the assumptions apply. Assumption (3), that supply is given, assumption (4), that supply is reserved for households, and assumption (5), that household’s nominal income is given, are particularly important. The interrelations become far more complicated if we relax these strong assumptions. This will be done in later chapters.

18.9. General position in the consumer goods sector

Below we formulate some hypotheses concerning the general position in the consumer goods sector. We do not have in mind the particular problems of any one Eastern European country at any particular time, but rather the general, abstract form of the system. As was pointed out in

section 18.7, no comprehensive and regular observations have been made which could unequivocally prove or disprove our hypotheses concerning the intensity of shortage. Sporadic observations seem to support our hypotheses. Let us summarize them briefly first, and then comment upon them in detail.

Hypothesis 1. Over the long period, real consumption has grown substantially in the socialist countries. At the same time, chronic shortages persist in several areas of the consumer goods sector.

Hypothesis 2. Households receive some goods and services through administrative rationing free of charge or at nominal prices. Some of these goods satisfy needs that will be satiated in the foreseeable future. Others meet needs that will not be satiated—and the chronic shortages here cannot be eliminated.

Hypothesis 3. Households purchase other goods and services at effective prices, through the market. There are chronic shortages of these goods too. A normal intensity of shortage becomes established in these markets.

In connection with hypothesis 1, the general public, and sometimes even economists who do not go sufficiently deep into the problem, are inclined to mix up the two—quite distinct—types of problems. The first issue concerns the level of consumption. Is an individual or a whole population, “rich” or “poor”? The second issue is whether the consumer gets what he wants for his money and, if so, does he get it easily or with difficulty? There is no causal relationship between the two issues as the whole argument of this book tries to prove. *Shortage is not the consequence of economic backwardness in a country.* Shortage economies exist where per capita levels of real consumption and output are high. And there exist countries where per capita levels of consumption and output are low, yet basically they are demand-constrained systems where a buyers’ market operates.

Not only is there no *causal relationship*, but there is no trade-off either as regards the *consequences*. The poor man living in a buyers’ market and standing with empty pockets before shop windows full of goods gets no comfort from the knowledge that he could buy anything if only he had the money. And conversely, a consumer in a shortage economy who has spent hours queuing, searching, and dealing with rude assistants, or a consumer waiting perhaps years for some kind of rationed good, gets no comfort from recognizing that his real consumption has been rising year by year. A point which we have repeatedly made in another context, when as a critique of utility theory we discussed substitution between and complementarity of advantages and disadvantages, holds here too. *One kind of vexation, pain or loss cannot be cancelled out with a qualitatively different pleasure and satisfaction.*

Economists, sociologists and social philosophers are increasingly recognizing that it is not sufficient to observe real consumption, and that living standards or the quality of life should be interpreted more widely. How the household obtains the goods it acquires is an important component of the quality of life. And here we have to stress the human consequences of the shortage economy, its effect on people's everyday lives.²⁹ It robs people of much free time. It causes nervousness and annoyance. It again and again leads to feelings of failure and frustration of desires felt to be reasonable. Not only is the physical loss of an unavailable good burdensome, so are the frequent inattentiveness and discourtesy of the seller, or the person providing the service or allocating the ration. It is annoying and often humiliating for the individual to know that he is at the mercy of those who should serve him. This is an unavoidable consequence of shortages in the consumer goods sector. It is, of course, worth while making efforts to educate sellers, and to make officials doing the rationing behave more courteously. But *the objective fact of shortages continually maintains a social relationship in which the buyer is at the mercy of the seller – and feels himself to be so.*

As a consequence, shortages continually reduce (though they do not eliminate) the satisfaction which people feel at the regular growth in their real consumption levels.

In connection with hypothesis 2, we note that goods and services which are distributed free of charge or at nominal prices by administrative rationing, should be divided into two categories. The first category comprises those goods and services, the desire for which can be satiated in the foreseeable future. Shortages in this category are transitory, although they may perhaps endure for a long time.

A characteristic example of this category is education. At a certain level of economic development every country can afford to provide twelve years of free education for everyone who wants it. At even higher levels of development an even longer period may be allowed.

The second group comprises those goods and services for which demand will never be satiated. The most important example is state-owned apartments. *The shortage here is not temporary but permanent* – it will persist as long as the good or service in question is given to the claimant free of charge or at a nominal price.

In section 17.6 we discussed the considerations which argue in favor of or against rationing; there is nothing to add now. Those taking the decision may decide in favor of accepting shortages as a social cost of the

²⁹Sociologists also deal with the social effects of queuing and waiting. See, for example, Schwartz (1975).

rationing scheme, in the interest of the features of the scheme which are deemed to be advantageous. The decision may be challenged, but it is not irrational. But the illusion must be abandoned that it is possible through rationing to eliminate shortages of goods, the demand for which is not satiated.

The preceding hypothesis is readily acceptable to most economists. Obviously, if a product the demand for which is insatiable is distributed free of charge, a shortage arises. But hypothesis 3 points to a phenomenon which is far from self-evident. We saw earlier that the household's budget constraint is hard. In Chapter 16 we made it clear that the total money income reaching the households is firmly controlled by the economic leadership. Total demand is thus given in nominal terms. Further, we stated that the price of commodities distributed by the market is effective in that it limits demand. Why, then, do shortages appear again and again in this sphere? Is the explanation not simply that prices of the shortage commodities have been set too low? Or, if prices are taken as given, does not the trouble arise because the relation between the total household purchasing power and the total supply of consumer goods has been planned incorrectly?³⁰

It would be very tempting to give simple answers to these seemingly simple questions. Yet we must postpone our answer, or rather our attempt at an answer. First we must analyze in the next chapters the roles of price and money, to get all the partial results we shall need to clarify the questions asked above. At this juncture, therefore, we can only set down hypothesis 3 and ask some questions without answering them.

18.10. A critique of the Clower–Barro–Grossman school

The ideas we have expounded about the market for consumer goods serve as a starting point for challenging the Clower–Barro–Grossman school on three points.

The first problem is related to the category of *aggregate excess demand*.³¹ To demonstrate the problem more clearly, in the following argument we stick to the household sector and consider only personal consumption, neglecting the demand of firms and nonprofit institutions. The usual interpretation of “aggregate excess demand” is the stock of money in the

³⁰Let us recall the planning algorithm described in section 16.2. Accordingly, the explanation for the phenomenon may be found either in the deficient planning of relationships (16.3), (16.4), and (16.5), or in deviations from correct targets.

³¹We have already mentioned the problem in sections 5.4 and 7.9, but now, having analyzed the consumer sector, we can explain our standpoint more comprehensively.

hands of the household sector which households intend to spend but are unable to do so with the given supply.

In my view, two cases should be distinguished. The first is the case of an economic system, where intense shortages are *uncharacteristic*. In a normal situation, shortages appear intermittently, temporarily and at a modest level. Such is the situation for example in the Federal Republic of Germany. Let us assume, as a mental experiment, that a strict price control is introduced from one day to the next in the FRG and is rigorously enforced. At the same time, the nominal wages of every worker are raised immediately by 50 percent. The consequences can easily be predicted. Stocks would soon be depleted. Many households would be unable to spend the money accumulating in their pockets. *This* situation might justly be called aggregate excess demand, and its extent could be measured in practice by the amount of money which suddenly accumulates in the pockets of the population and which remains unspent in spite of households' intentions. We add that this might justly be called a *disequilibrium*, since the system would have deviated from its normal state.

The other case of a *chronic shortage economy*, differs from the former one in essential respects. Here frequent, permanent and intense shortages have become the normal state of the system. Buyers have adjusted their attitudes to chronic shortage. They try to satisfy their initial demand which has from the very beginning been formulated to take account of the shortage. But if they do not succeed, then perhaps after some search and waiting they make forced substitutions or undertake forced spending. Whether they fully succeed depends on the intensity of the shortage. Section 18.4, which discusses forced spending caused by shortage, has already explained this in detail, so we only refer to it here. It is not clear what should be called aggregate excess demand on the macro-level. Should it be only money which cannot be spent at all? But this is found only with a generally very intense shortage. (See phenomenon (c) in section 18.4.) If the answer is in the affirmative, then in a number of chronic shortage economies, where massive forced substitution, forced spending, and queuing are to be found but hardly any really *unspendable* money, there is thus no aggregate excess demand. Or should we interpret the notion widely and include all money that has not been spent according to *initial* demand? It seems that the term *aggregate excess demand is not an operational category in an economy with chronic shortages*. Shortage has to be characterized by a vector of disaggregated indicators, as we explained earlier in the book.

In discussing the first point we have touched upon the second point of controversy: the use of time series of *household savings* to characterize the general state of the market. Attempts have been made to conclude from

the time path of savings in the household sector whether the consumer goods market on the macro-level is in a state of aggregate excess demand or aggregate excess supply.³² The theoretical background for the argument is provided by the Clower–Barro–Grossman train of thought mentioned above. The time path of household savings is partially explained by standard factors, especially the changes of income. If savings turned out to be higher than the level explained by these factors, this is a sign of “aggregate excess demand”, and conversely. In my view this conclusion is not justified. It is true that there is a causal relationship between shortage and household savings. But since it operates through several causal chains—some of them contradictory—it is not at all certain whether an increase in household savings reflects a growing or a diminishing shortage. If, for example, the money is indeed unspendable and savings increase *on this account*, then this indicates a growing shortage. If, however, the opportunities for travel or private construction have just opened up and *this* holds back people from undertaking forced spending and prompts them to greater voluntary prior saving, then an increase in household savings reflects a diminishing shortage. The economic content of changes in household savings over time can be understood only on the basis of a detailed analysis of specific circumstances.

One of the merits of the Clower–Barro–Grossman school is to have made an attempt to generalize Keynesian theory. It is to be feared, however, that in the meantime they have developed all too simple “symmetries”. Simplifying their line of reasoning somewhat, we can characterize this kind of symmetry as follows.

The key problem of Keynesian unemployment is the insufficiency of aggregate demand. The opposite situation obviously arises when aggregate demand is too high. So far there is no particular mistake in the line of reasoning. The trouble begins when this opposite situation is taken as the theoretical model of the state of the market in a socialist economy.³³ It is, in fact, an extremely important characteristic of the latter that its mode of operation, its management system, and the behavior of the agents within it have adjusted to chronic shortage which is continuously maintained by the institutional relationships. It is a complete mistake simply to describe this

³²See, for example, Portes–Winter (1978).

³³The articles by Barro–Grossman (1971, 1974) indicate explicitly that the aggregate excess demand they describe prevails in the economies of the Eastern-European socialist countries. Other followers of the school (e.g. Portes, Howard) apply the Clower–Barro–Grossman theory expressly to the socialist economy.

system as a symmetrical “reversal” of the Keynesian scheme, with the sign changed.

The third point to be discussed is *the effect of shortage on the supply of labor*. If it were true that in conditions of shortage money cannot be spent on anything, it would not be worthwhile working for additional money. Accordingly, a growing shortage should always lead unambiguously to a diminishing supply of labor.³⁴

The issue is basically an empirical one. As long as the shortage is not so very intense as to make prospects for spending any additional money income almost hopeless, it does not discourage people from taking a job. If it has any effect on labor supply at all, it is the opposite one. Some people seek even more money, because they believe that, if they have more, they may have easier access to what they wish to buy even in a shortage economy. For example, if they have to make forced substitutions, they can more easily afford to buy a more expensive substitute of better quality rather than a cheaper one of poorer quality. They can pay the prices on the “grey” or black markets more easily. Of course they feel this way both when the shortage intensifies and when it is less intense. In the final analysis we may say that the intensity of shortage is not one of the variables explaining labor supply either positively or negatively.³⁵

³⁴See Barro–Grossman (1971, 1974). Howard (1976) “econometrically verifies” the Barro–Grossman theory using Soviet data. In my opinion the verification is not convincing, because the theoretical foundation of the econometric analysis is erroneous.

Howard assumes that an increase or decrease in the production of consumer goods, or an acceleration or deceleration of the growth rate of their production reflects a decreased or increased shortage in the market for consumer goods. As a matter of fact—as we tried to emphasize in the earlier parts of this chapter—changes in the production and consumption of consumer goods and in the intensity of shortage may depart from each other.

The time series examined show that the production of consumer goods and employment are moving together. This is self-evident, since the share of consumer goods in total output is rather stable, and labor productivity is fairly constant over time. From the fact that the output of consumer goods and employment move together, nothing follows concerning the relation between shortage and labor supply.

³⁵For the variables explaining labor supply see Chapters 11 and 16.

Consumer goods prices and shortage in the consumer goods sector

19.1. Introduction

In Chapters 17 and 18 we touched several times on the effect of prices on household behavior, and on the state of the market in the consumer goods sector. The present chapter systematically summarizes what we have to say about consumer goods prices.

From this extremely wide-ranging set of problems only a few will be treated – those which are most closely related to our main subject, which is *shortage* in a socialist economy. As before in Chapter 15, which dealt with interfirm prices, we shall not develop policy proposals here; we shall approach consumer goods prices in an entirely *descriptive manner*.

We cannot discuss all kinds of consumer goods prices. We shall disregard in general the prices of products manufactured in the cooperative and the private sector and sold directly to households. Except in the last section of the chapter we shall discuss only the prices of goods delivered by state-owned firms to households. If, for the sake of brevity, we use the expression “consumer goods prices” without elaboration, we always mean prices of this type of goods.

Many of the observations we made in Chapter 15 about interfirm prices, including our remarks on the tendency towards price-drift and state intervention also hold for the products discussed in the present chapter. Yet we must stress a few special properties of consumer goods prices.

The most important distinguishing feature is obvious. The level of consumer prices affects the lives of millions much more closely than the level of interfirm prices. The latter are an internal affair for economic managers and they affect the financial position of workers only to a limited extent, through profit sharing for example. Therefore, movements in consumer goods prices are a delicate political problem for all systems.

We said in connection with interfirm prices that the buyer usually cannot or dare not resist the seller's efforts to increase prices. And it is not a question of life or death for the buyer, either, since his budget constraint is not hard: he shifts increased input costs onto his own buyers as far as he can through price increases, or he asks for support from the state budget. The situation is different with the consumer goods price. The budget constraint of the household is hard. If it has a given nominal income, every price rise cuts it to the quick. Therefore, the buyer tries to resist price increases. If there is no other way, he does so by "voice": by grumbling and protesting. That is precisely why consumer goods prices become a political issue.

For this reason state intervention is more widespread in this sphere than in that of interfirm prices.¹ There are also more possibilities for intervention. The most important staple consumer goods—particularly basic foodstuffs and public services—belong to the category which we designated "standard mass-produced products" in section 15.2, and their prices are therefore easy to administer. But prices policy can—if it wants to—successfully resist the tendency towards price-drift in the case of less easily administered prices too. The process may start with firms pushing up the consumer goods' prices. Rates of turnover tax on consumer goods which may be positive or negative (i.e. subsidies granted to maintain the price of certain goods) are determined individually for each product or group of products and are modified from time to time. The system of positive and negative rates of turnover tax makes it possible to separate movements in interfirm prices (and producer prices generally) from movements in consumer prices. A rise in producer prices, although it puts pressure on consumer prices, does not automatically entail a rise in the latter.

In view of the extreme importance of state intervention in the formation of consumer prices, we focus our attention on this aspect. The seller's tendency towards price-drift, however strong, could be stopped by state intervention² at a certain point. The question which we seek to answer is, *why* does it stop at *exactly that point*? Why is the price level of various groups of consumer goods what it is and not lower or higher?

In sections 19.2–19.8 we try to answer these questions. Accordingly we deal only with consumer goods prices which are sufficiently administrable and normally easily administered. We deal briefly with prices that are not

¹"It is our general aim to ensure first of all that the relative stability of consumer prices is guaranteed, while producer's prices may be allowed greater flexibility", writes Minister of Finance, L. Faluvégi, in his book (Faluvégi, 1977, p. 71).

²In this connection we recall the remarks we made concerning formula (15.1).

easily administered and with the spontaneous tendency of the producer towards price-drift in the final section, 19.9.

The greater part of the chapter discusses relative prices of consumer goods. Sections 19.4–19.6 are exceptions, since they examine changes in the average price level in the market for consumer goods *as a whole*, and the interrelationships between these changes and other market phenomena.

The subject of the first part of the chapter is the *short-term* impact of consumer goods prices and the short-term control and adjustment of demand and supply. Beginning with section 19.7 this is complemented by an account of some *long-term* interrelationships.

Many of our ideas relate equally to price changes in both *traditional* and *reformed* socialist economies. Where we wish to distinguish between the different systems we shall draw attention to this fact separately.

19.2. An illustrative example

We shall begin our reasoning with the simple model of a particular market which we used in section 18.8 above. We shall not repeat the assumptions we made there in detail, but shall recall only the most important ones. We shall describe the behavior of the market over a certain period (e.g. a year), using appropriate indicators. We shall carry out a *comparative static analysis, ceteris paribus*, taking as given supply, the intended level of expenditure on this particular market by all households, relative prices within the market, prices on all other markets, and frictions in adjustment. In the particular market under examination only households make purchases. The question is, how does the shortage change in intensity in the short run as the price level of the product group under discussion changes.

Figure 19.1 is similar to figs. 18.4–18.6. The horizontal axis shows the price level for the group of consumer goods. The vertical axis measures two indicators of the state of the market, a *shortage* indicator z which is a representative component of the vector \mathbf{z} , and a *slack* indicator q which is a representative component of the vector \mathbf{q} . (In the latter respect we go beyond the figures in Chapter 18 in which slack was not represented.)

To every price level p there belongs a pair of vectors $[\mathbf{z}(p), \mathbf{q}(p)]$, that is a set of values for the shortage and slack indicators. Shortage is a decreasing function of the price level, while slack is an increasing function of it. We do not ask when this market would be in a perfect Walrasian equilibrium, since we have to take account of frictions in adjustment. We

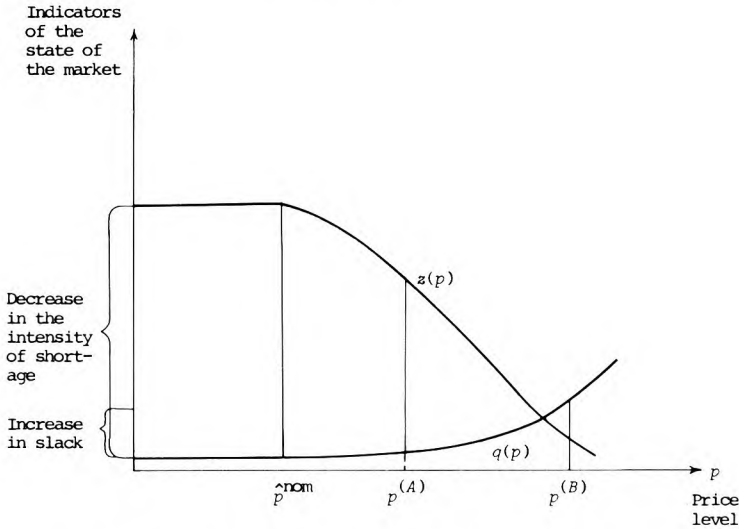


Figure 19.1. The relationship between the price level, shortage, and slack.

only consider what will happen if we raise the price level radically from its original value $p^{(A)}$ to the much higher value $p^{(B)}$.

As our first illustrative example let us take the industry that performs dry-cleaning, laundry, and similar services for households. This is a considerable, though not essential, element in consumption.

As a result of a drastic price increase, household demand for services of the industry would considerably diminish. Consequently, *the intensity of the shortage would decrease considerably*, although it may not disappear entirely. There would be less time spent waiting for service in the shops and shorter delivery times would be given. In addition to these immediately perceptible changes, we can also expect long-run effects. The utilization of machinery and staff will decrease in the laundries. Now, if the seller were interested in increasing his sales, he would make efforts to give customers a better service so that the latter continue to use his services. *Laundries would compete with one another by improving quality of service paying more attention to the customer, and introducing new services*, and they would also compete with other sectors that wish to attract the purchasing power of the consumer.

These *advantages* are on one side of the balance. On the other side, however, the following *disadvantages* arise.

The first disadvantage is the simple fact of the price increase. Precisely because a rather high-degree of price stability is one of the greatest achievements of socialist economies, the population *expects* prices to remain unchanged; *stability in itself is of value to people*. The mere fact of a price increase causes unrest, much more so than in countries where accelerating inflation has accustomed the population to permanent price rises. Inflationary expectations have developed there, and society feels that an ordinary rise is "normal".

A price increase causes slack to increase. We explained in detail in Part I that shortage and slack may appear simultaneously in a shortage economy. There may previously have been nonmobilizable slack in the laundry owing to the lack of complementary inputs; a worker may have been missing, or a chemical may have run out, or one of the machines may have broken down. In the case of a drastic increase in prices, however, *mobilizable* slack may result: labor, materials and capital may all be idle at once. There would be a reserve supply of each of the complementary inputs. This could in fact count as an advantage, since it makes for a more flexible adjustment to unpredictable fluctuations in demand. Yet many "feel" that it is a disadvantage. Public opinion in the socialist economies considers the constant presence of such mobilizable slack to be a *waste*. "There is a heap of dirty clothes, yet the workers and machines are not working..."

As a consequence of raising the price, *the level of consumption is instantaneously reduced*. The relationship is trivial. At the given moment output of the cleaning industry and household consumption are reduced by as much as could have been produced by the increased slack. Those who use the services of the cleaning industry even after the price increase have access to them more easily and conveniently, but some consumers are excluded from the service.³ Later, this may be indirectly compensated for as the work of laundries improves in the "buyers' market", becomes more efficient and is finally able to produce more output of better quality. However, this is a delayed and somewhat uncertain consequence, while the reduction in output through the creation of mobilizable slack occurs immediately.

What is more, this fall in consumption has *redistributive consequences*. Those who are able and willing to pay the higher price can get the service

³We shall once more recall the witty remark of Robinson-Eatwell (1973, p. 269): "A promise of a great economy in shopping power would not seem to compensate for an immediate loss of money purchasing power."

A similar idea appears in the book by Goldman (1977). He points out that restricting purchasing power may increase "the efficiency" of consumption.

more easily and conveniently. Those who are unable or unwilling to pay the higher price are deprived of a service they used previously even if they used it only after waiting, queues or through forced substitution.

The above-mentioned advantages and disadvantages are the main ones taken into account when the decision is made whether to maintain or change the price level of a product group. But let us stop here, since our train of thought can easily get us on a false track at this point. The impression may be gained that the price level of a group of products determines the situation in the market by itself. Yet this is not so in reality. In the simplified world of the above-mentioned model, the price level was the only control variable because our analysis was in comparative static terms and based on very strong assumptions. It is time to step beyond the confines of this model.

19.3. The siphoning-off effect of other sectors

Let us first relax assumption (4) of the model, which reserved the market in question for households only. It is not the real situation in the case of the cleaning industry for example, whose services are used not only by households but also by the catering industry, hairdresser's shops, and factories to clean the working-clothes of their employees. The same price increase that induces the housewife to return to washing at home will not deter a restaurant or factory at all.

Let us investigate the question in a more general form than the example of the cleaning industry.

There are such products and services bought exclusively by households. For example, the latter are the only users of barbershops and of cinemas. It is not easy to find these examples since there are only a few goods and services which, because of the physical nature of the output and the way it is used, are only useful for households and can in no way be used as inputs to firms or nonprofit institutions, and cannot be exported. It happens much more often that the household sector, firms (including exporters) and nonprofit institutions compete with one another.

This competition may be for the final product itself, assuming that it can be bought on the retail market by anyone without administrative limitation. For example, both private customers and firms or the nonprofit institutions can make purchases at the same stationer's shop, or furniture dealer, and can use the same taxis or the same garages.

However, competition may start at an earlier stage. Suppose that industry has produced bricks and cement. Should they be delivered to a shop that sells building materials for private customers, or to a construction

organization that is building a factory? Should the domestic retail trade receive the output of the food industry or of light industry, or should it be exported?

The household sector competes for the product with other sectors, but *this is competition on unequal terms. The household has a hard budget constraint, and the firm has a soft one.*⁴ The same thing can be said about exporting firms: even if some of their exports make loss in domestic currency, the state can compensate them for it in the same way as it compensates producers. (As we explained in section 14.9, a nonprofit institution is in an intermediate position from this point of view.) Households respond sensitively to price changes. If the price rises, household demand will decrease. As opposed to this, the firm is less responsive to input prices. If it needs something that is available, it will buy it.⁵

As long as the behavior of firms and of nonprofit institutions does not change, an increase in the level of consumer prices will reduce the intensity of shortage only if⁶ the amount siphoned off by these sectors is restrained *administratively*. In other words, there must be a restriction preventing firms and nonprofit institutions from taking up the mobilizable slack released by reducing household demand.

There are areas in which such administrative prohibitions can be enforced. In other areas it is much more difficult to do so. It is particularly difficult to enforce such restrictions if what producers siphon off is not a final output but a direct input in the production of such an output. This would happen if, for example, industry draws labor away from the retail sector, which worsens the service offered to households.

At the end of section 15.8 we stressed that there is no automatic trade-off between raising the level of interfirm price level and lessening the intensity of shortages in interfirm trade. Now we add that *there is no automatic trade-off between raising the level of consumer prices and lessening the intensity of shortage on the consumer market.* We shall adduce several arguments to support this statement, and we have already come to the first one. *Firms and nonprofit institutions, being not very responsive to increases in input prices can, despite price increases, siphon off consumer goods and services, or their inputs from the household sector, which is responsive to the rise in prices.*

⁴More precisely, the degree of hardness or softness depends on the actual form of economic management. But, as explained in Chapter 13, even since the reform the firm's budget constraint has been soft enough for the above comparison with the household to hold.

⁵In Hungary the purchases of consumer goods by firms and nonprofit institutions have grown much faster than those of the households. See Pálos-Pintér (1978).

⁶This is *one* of the necessary conditions. We shall see later on that there are others.

19.4. Macro-planning of consumption at the center: First approach

We now take a further step towards relaxing the simplifying assumptions hitherto made in this chapter. In the previous section we pointed out the decentralized ways in which firms and nonprofit institutions may divert final products destined for consumers, or inputs from industries producing for the household sector. But this is a secondary phenomenon. Let us examine the primary problem, namely, how much is allocated by the central planners for the household sector.

The subject of the present section and the next one is the *short-term macro-planning of consumption* at the center. An abstract model will be presented. It is used only to *describe* the planning processes taking place in a socialist economy. The model is neither required nor suitable for use as a practical instrument in planning. To this extent these two sections are like some earlier parts of the book, Chapters 3, 9, 10, and section 12.11, where we discussed the “conditioned reflexes” of the planners, and section 16.2 where the algorithm for wage planning at the center was described. Now, too, we should like to identify a few regularities in the planners’ behavior.

As in the case of wages policy, we shall elaborate an *algorithm for taking planning decisions*. We do not think that events follow upon each other in this order in the actual planning process. The algorithm is merely an easy way of presenting the inner logic of the intricate sequence of decisions.

The algorithm consists of five steps. We assume that it is iterative and that all or some of the steps may be repeated if decision-makers feel that the results are not satisfactory or if new information becomes available. In the present section the algorithm is presented in its simplest form. In the next section the description will be made more detailed and more complete in some respects.

It is assumed that the purpose of the stage of planning we are discussing is to determine five macro-targets for the following year and to derive from them some disaggregated plan targets as well. Let us first list these five macro-variables.

(i) *Total volume of goods and services physically available for purchase by the household sector*. This will be denoted by the symbol s , and called *supply* for short.

It is a *real* magnitude, an aggregate usually computed in planning practice using the actual prices of some earlier period called the base year.

The magnitude s comprises the supply of both goods and services. For goods it contains the initial stock at the beginning of the planned year and the total deliveries to be made in the course of the year. For services it is

the maximum volume of services that can be produced. Thus, the variable s is not what the planners intend to sell; nobody thinks that the households will actually buy amount s of commodities. It is the maximum amount of goods and services which households could purchase—if they were able and willing to buy everything that is *physically* available to them.

In order to simplify the reasoning we have from the start excluded goods and services which the household sector obtains free of charge.⁷ The quantity s thus comprises only the supply of *commodities* which can be bought *for money*.

We have similarly excluded consumer goods destined by the central planners for firms (including exporters) and nonprofit institutions. Thus, should further siphoning off appear on the part of these sectors, this would amount to a deviation from the plan.⁸

(ii) *Volume of commodities purchased by the household sector*. This will be denoted by the symbol g , and called *consumption* for short. The abbreviation, although commonly used, is in fact inexact. There may be a time lag between purchase and actual consumption; and in addition the household gets some consumer goods free of charge.

Like s , this is a *real* magnitude, a macro-aggregate computed at base-year prices.

(iii) *The money spent by the household sector on the purchase of commodities*. It will be denoted by the symbol y , and called *expenditure* for short. It is the total money income of the household sector in the year planned for,⁹ less the expected value of savings (or, in the opposite case, plus the reduction in the households' stock of money, dissaving).

(iv) *The consumer price index*, to be denoted by the symbol P . It is the ratio of the consumer price levels in the planned year and in the base year.¹⁰

(v) *The total volume of domestically produced and imported consumer goods destined for the household sector*. It will be denoted by the symbol x

⁷We must also deduct stocks and spare capacity linked with goods and services distributed free of charge.

⁸We draw attention to the fact that this "siphoning-off" effect has been ignored only in sections 19.4 and 19.5, when we discuss the algorithm for planning consumption. Later, in section 19.6, it is reincorporated into the analysis.

⁹We ignore the services rendered by one household to another in return for money. The sole purpose of our macro-analysis is to examine the relationship between the household sector *as a whole* and the rest of the economy.

¹⁰The difficulties of constructing volume and price index numbers are well known. We mentioned the latter ourselves in section 15.4. However, since these indexes are used only for the purpose of *theoretical* analysis, we need not discuss the difficulties here.

and called *output* for short. In respect of how it is calculated and what products are included or excluded it is similar to the other two volume indicators, *s* and *g*.

There are two self-explanatory interrelations between the variables:

$$g \leq s \quad (19.1)$$

level of consumption		level of supply
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and

$$g \equiv y / P \quad (19.2)$$

level of consumption		expenditure		consumer price index
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By setting out the algorithm, we want to identify the factors which determine the variables listed above and establish their relative influence or weight within the decision process.

Step 1: Consumption. This corresponds to step 1 of the wage policy algorithm and embodies a decision which is identical in content. Let us recall what we said there.¹¹ *It is considered an important principle of planning that the increase in real consumption levels must not fall below a socially given tolerance limit and that it should be as near as possible to the normal rate of growth of real consumption.* The size of the target plan *g* derives from that.

Step 2: Consumer price index. As we emphasized in section 19.1, government price policy is directed towards the attainment of price stability. Yet for various reasons the macro-plan may inevitably lead to an increase in the level of consumer prices. On the one hand, it may yield to decentralized forces leading to price increases. On the other hand, it may also plan a rise within the sphere of administrative consumer prices which can be well handled centrally. All these questions have already been touched upon in Chapter 15, and that discussion will be complemented by further observations in the remainder of this chapter.

Thus, the plan target for *P* is derived in this step of the algorithm.

¹¹The variable *y* does not cover the whole of consumption, since we excluded that part distributed free of charge. By contrast, in step 1 of the wage algorithm the latter is included as part of real consumption (although *per capita* consumption was used there, and the total consumption here). For the sake of brevity, we shall refrain from indicating the similarities and differences between the five variables in the present algorithm and the identical or similar variables in the wage algorithm. Their relationship is clearly indicated by the definitions.

Step 3: Expenditure. The process of planning nominal income has been described in detail in section 16.2. We explained that it cannot be fixed by central economic policy at will, as several interrelationships have to be observed. As we pointed out there, it is possible to plan nominal income accurately; fulfilment usually differs but little from the plan figures. There is more uncertainty in the targets for household savings. An error in the forecast may cause a deviation from the plan – but we need not deal with this, since we are now only concerned with describing planning.

The plan target for y emerges at this step of the algorithm.

Let us stop here for a moment. The determination of the three plan targets discussed up to now – g , P and y – is influenced by several circumstances operating independently, as already indicated here and elsewhere in the book. But these three figures are, of course, closely interrelated, last but not least because of identity (19.2). If necessary, the cycle consisting of steps 1, 2 and 3 is repeated several times, until the three targets are mutually consistent.

Step 4: Supply. In this and in the succeeding step we initially formulate a rigid rule as a first approximation, and make the description more exact and more realistic at a later point in the analysis. But first an important idea must be clarified.

We shall call the following ratio the *degree of utilization* of supply and denote it by κ :

$$\kappa = g / s. \quad (19.3)$$

degree of utilization	con- sumption	supply
--------------------------	------------------	--------

The symbol has been chosen so as to call to mind the concept introduced in Chapter 12 of utilization of social capacity. The magnitude defined in (19.3) is a related notion, an application of the category introduced there to the commodities purchased for consumption purposes. It is physically possible that $\kappa=1$, and that the households buy up available commodities down to the last item and utilize the capacity of organizations supplying services to the maximum extent. In reality, however, this never occurs: κ is always smaller than unity.

Our book tries from several angles to demonstrate the proposition that a normal state of the market develops and gets established in every socioeconomic system. *Accordingly, there is a normal degree of shortage, a normal degree of slack and, at the same time a normal utilization of supply in the*

consumer goods sector. These magnitudes are interrelated. Let us denote by κ^* the normal degree of utilization defined in (19.3). Thus $(1 - \kappa^*)$ is the ratio of normal slack to total supply.

In Part I, mainly in Chapters 5 and 6, we drew attention to the distinction between productive and unproductive slack. The first can be used, the second cannot. The normal degree of slack $(1 - \kappa^*)$ comprises both productive and unproductive slack. We assume that the normal ratio of productive to unproductive slack is fixed.

We should also like to recall what we said in Chapter 8. We explained there that there is a close relationship between the intensity of shortage and the level of productive slack. With given normal frictions in adjustment, the smaller is productive slack, the greater the intensity of shortage, and conversely.¹²

Having said that, we may proceed with step 4 of the algorithm. According to our hypothesis the following rule applies:

$$s = g / \kappa^* \tag{19.4}$$

supply	con- sumption	normal degree of utilization
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This simple formula expresses an important economic idea. Planning considers κ^* , the normal degree of utilization, and hence too the normal degree of slack and the normal intensity of shortage as given exogenous magnitudes. In other words *at the macro-level, ex ante, the normal intensity of shortage in the market for consumer goods is not a function of the price level, or of nominal incomes, but is a given parameter in the macro-planning process.* There is no direct connection between step 4 in the algorithm, the determination of the variable s , and steps 2 and 3, which determine P and y . The variable s is found directly from g which is determined in step 1 and from the exogenous κ^* .

Step 5: Output. The macro-variable x , the sum of domestic production and imports, is divided into two parts:

$$x \equiv x^{\text{good}} + x^{\text{serv}} \tag{19.5}$$

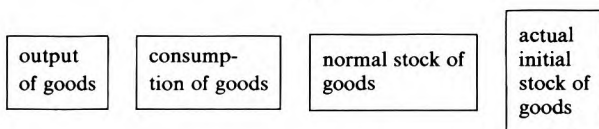
output	output of goods	output of services
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The superscripts “good” and “serv” are also used in the symbols that follow.

¹²See sections 8.7 and 8.8 and the figures used there.

Let us look first at the rule which determines the production target for goods:¹³

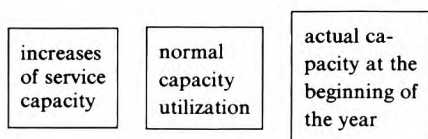
$$x^{\text{good}} = g^{\text{good}} + \left(\frac{1}{\kappa^{\text{good}^*}} - 1 \right) g^{\text{good}} - u^{\text{good}}. \quad (19.6)$$



Formula (19.6) presents *control by norm*. Should the state of the market deviate from the normal one the planner tries to force it back nearer to the norm by the appropriate determination of the macro-variable. This is related to the control by norm mentioned in Chapter 7. Here too, as there, deviations from normal levels of slack and shortage serve as feedback. The difference is that Chapter 7 described a *decentralized micro-level* control mechanism, while now we consider a *centralized macro-level* control mechanism. The two kinds of mechanism assume and complement one another. They jointly ensure that norms of slack and shortage become habitual.

With services, output and consumption are identical by definition:¹⁴ $x^{\text{serv}} \equiv y^{\text{serv}}$. Control by norm operates here to determine capacity increases:

$$\Delta s^{\text{serv}} = \frac{1}{\kappa^{\text{serv}^*}} g^{\text{serv}} - s^{\text{serv}} \quad (19.7)$$



This completes the algorithm. We have also determined the output targets x^{good} and x^{serv} . It may turn out that these are inconsistent with other output and foreign trade targets in the plan, with the demands for

¹³No attempt was made to rearrange expressions (19.6) and (19.7) into their simplest possible mathematical forms. Instead we present them in a form that most clearly expresses their economic content.

¹⁴For the sake of simplicity it is assumed that no services are imported for households to consume.

inputs of firms and nonprofit institutions, and so on. Then, after an appropriate modification of the starting point, the process will start anew. Precisely because of the iterative nature of the process it is not worthwhile asking whether it starts from a consumption target or a production target.

The description of the algorithm is sufficiently general to cover planning in both the traditional and the postreform systems of economic management. The difference shows mainly *in the methods of plan implementation*. In the *traditional* system the macro-targets of the plan are broken down by ministry, then by middle level organization and finally by firm and nonprofit institution. At every level of control the addressees of messages get instruction for implementation of the part of the plan that is their responsibility. Households, which within the constraints of supply dispose of their money as they wish, are an exception. Under these conditions what is prescribed by the central plan is obviously of very great importance in deciding the state of the consumer goods market.

In the *postreform* system of economic management the firm does not get an obligatory directive, and this enhances the role of decentralized processes operating through prices or independently of them. However, under this system too the central control organs have at their disposal means of enforcing the targets relating to the consumer goods market. Above all, they exert strong influence on the allocation of investment (see Chapters 9, 10 and 13). If it does not operate in the short run, in the long run this significantly determines what productive capacities are available for the production of consumer goods. By various indirect instruments (granting or refusing credit, granting or withdrawing financial support, etc.) upper and middle-level organizations influence the short-term plans of the firm. They can communicate their expectations emphatically. They can energetically control imports and exports of consumer goods, which affect the situation on the domestic market. For all these reasons we can assert that the central macro-planning of consumption does not simply yield a forecast of the outcome of decentralized processes, but it is a starting point for active government measures. The consumption targets in the central plan exercise a major effect on the state of the consumer goods market, even after the reform.

19.5. Macro-planning of consumption at the center: Further remarks

The behavioral rule expressed in steps 4 and 5 of the algorithm is crucial for our argument that *norms of utilization, slack and shortage are given parameters in the planning process*. While preserving the substance of the

idea, in the second approach we may formulate it somewhat more precisely.

We do not believe that the normal degree of utilization κ^* and the other norms mentioned are uniquely determined constants. We should rather say that there is a *domain* of values for the indicators expressing the state of the consumer goods market which, in the given historical period, is felt to be normal by the planners. Assuming a constant only simplified the formula.

Nor do we state that norms of shortage, slack and utilization hold forever. If there are essential changes in economic policy and in the methods of economic management, the norms will change as well. Such a shift has taken place in Hungary, as we indicated in earlier chapters of this book: shortage is much less intense than ten or fifteen years ago. This change can be particularly felt in the area discussed in the present chapter, the consumer goods market. However, with a given institutional framework, a permanent economic policy, and a given system of economic management, the norms are rather firm.

We call our description of the regularities of behavior expressed by steps 4 and 5 of the algorithm a *hypothesis*, since we cannot prove them rigorously. But some evidence supports, at least indirectly, the validity of the hypothesis.

At the beginning of the chapter we asked as an illustrative example what consequences would follow an increase in the price of laundries. Among other things we pointed out that if in consequence of the price rise mobilizable slack were to arise, this would evoke disapproval with many people who would feel that it was a waste. What we said there for the micro-level, also holds at the macro-level. If the plan target for the real earnings of the household sector (that is, disregarding savings, the variable $g = y/P$ determined by the first three steps of the algorithm) increases by 4 percent for example, then the planners would make efforts to cover this increase with goods by providing for a 4 percent growth in output x . They might perhaps deviate somewhat from this target. For example if they believed that stocks were "abnormally swollen", they would prescribe less than 4 percent increase. But there would be no suggestion that s , the target for physical supply should increase much faster than g , the real demand, for some longer time so that κ , the degree of utilization, should significantly decrease.¹⁵ The evident fact that this is *not even formulated* as an

¹⁵In this context the *wish* is usually voiced that the composition of slack should be improved: and that its unproductive part should diminish and its productive part should grow. It is obviously desirable to fulfill this wish. Using the analytical apparatus introduced in Chapter 8, we might express this as follows: the system should move to an iso-friction curve

important dilemma is indirect proof of the proposition that the normal degree of utilization κ^* and, together with it, the normal levels of slack and shortage are given parameters in the macro-planning of consumption.

Policy-makers and planners know that there are urgent claims on resources from all sides. The hunger for investment which permeates every tier in business and government life from the shop manager to the minister, is operating to get resources for investment purposes. Those conducting foreign trade and international financial relations would like to divert as much as possible of total domestic production for exports and to reduce imports at the same time. Macro-planning has gained a major victory already if it succeeds in “defending” the growth of real consumption against such and similar claims. That one could go further than that and draw away resources from investment, exports, etc. only to reduce—with a given target for real consumption—the shortages on the consumer goods market seems impossible and no such proposal is seriously made.

19.6. Some general conclusions

Some more general theoretical conclusions may be drawn from the assertions in the two preceding sections. For the sake of comparison let us set out the neoclassical comparative static model of a particular market. On one side are ranged the sellers, whose supply increases as a function of price. On the other side are ranged the buyers, whose demand decreases as a function of price. If the price is below the Walrasian equilibrium price, there is a shortage. Increasing the price up to the Walrasian equilibrium level eliminates the shortage.

We are not going to discuss whether the model correctly describes the markets in modern capitalist economies. Let us immediately turn to our present subject, the consumer goods market of a socialist economy. How does it differ from the market described in the above model?

Let us make the answer easier by neglecting the nonprofit institutions on the demand side as well as small private plants and other elements of the “second economy” on both the demand and the supply sides.¹⁶ We have thus three kinds of agent in the market: households as buyers, firms as

corresponding to less friction. But this cannot be achieved simply; several conditions concerning economic management, the system of incentives, etc. must be fulfilled.

¹⁶Including the areas we have excluded from the analysis would make the exposition lengthy but would not modify the final conclusions.

buyers and firms again as sellers. We are discussing the total quantity of consumer goods released by the firm sector onto the home market. We wish to clarify how the three kinds of agent behave, following their own motives and their own rules of behavior.

The budget constraint of the *household* is hard. Therefore demand of all households for the total quantity of consumer goods behaves in a "neo-classical manner": the demand curve slopes downwards. This is self-evident, if only because of the income effect. With given nominal income and given saving rate, a higher price level obviously leads to a situation in which households are able to buy a smaller quantity of consumer goods.

The *firm* by contrast does not behave in a neoclassical manner in either of its roles.¹⁷ Though the softness of its budget constraint depends on the actual system of economic management, it is still rather soft even after the reform; in the traditional system it is much more so.

On the *demand* side there is no automatic mechanism ensuring that a rise in the consumer price level reduces the firms' demand for consumer goods which they need as inputs. Therefore, the siphoning off effect described in section 19.3 may operate independently of the price level. Otherwise, this is a phenomenon of secondary importance. What firms do on the consumer goods market in their capacity as *buyers* is almost dwarfed in importance by what they do in their capacity as *sellers*.

On the supply side, we repeat that there is no automatic mechanism ensuring that a rise in the consumer price level increases firms' supply. Changes in relative selling prices may influence the composition of output, but they do not affect the total volume of production which is as high as bottlenecks allow, i.e. up to resource limits.

*Thus, as regards the spontaneous behavior of micro-organizations, there is no behavioral regularity ensuring that a rise in the price level of consumer goods eliminates the shortage. The reaction of households to the price rise (reduction in real demand) is in itself insufficient to eliminate shortage, if neither firms' supply nor their demand for consumer goods is price-elastic.*¹⁸

Our conclusion is based on the behavioral regularities of the *micro-organizations* (firms and households). Using the analysis of sections

¹⁷See Chapter 14.

¹⁸We have tried to formulate the relationship sharply. Therefore, the summary does not extend to degrees. To make it more accurate we can add a few complementary remarks observing, for example, that the actual composition of supply depends on relative prices, that the firm's instantaneous demand may temporarily decrease if inputs become more expensive, and so on. But these do not modify the substance of the above statement.

19.4–19.5 we will now confirm it by conclusions drawn from the behavioral regularities of central planners.

Macro-planning in a socialist economy has no automatic mechanism ensuring that the target for aggregate supply in real terms immediately responds to changes in the average consumer price level. In short-term macro-planning of consumption a “quantity” adjustment takes place. Targets for the production of and foreign trade in consumer goods are co-ordinated with targets for real household consumption as well as for supply to firms and nonprofit institutions.¹⁹ All these adjustments are made in a manner which tacitly acknowledges persistence of the normal levels of shortage, slack and utilization.

One of the reasons why shortage on the consumer goods market is maintained at its normal intensity is the fact that a deviation from the normal state is an important signal for those who control supply both at the macro-level in the center and at the micro-level in firms.

In economic discussions in Hungary the suggestion was made that a rise in prices (either a once-over increase or a steady, inflationary increase) might reduce or even eliminate shortages and “might restore equilibrium between demand and supply”. Accordingly, there would be a trade-off between inflation and shortage. A faster rate of inflation would lead to a reduction of shortages, and conversely. If our line of reasoning above is correct, it refutes this idea. *There is a causal relationship in one direction: the shortage strengthens the tendency towards price-drift.* (See Chapter 15 and the last section of the present chapter.) *But there is no causal relationship in the opposite direction.*

It is my impression that those who believe in the causal relationship from a price rise to the elimination of shortage have in mind the “Marshallian cross”, on the standard market model outlined as the starting model of the present section. In that model the causal relationship is *bilateral*: a shortage raises price, a rise in price eliminates a shortage. But, as has just been explained, in the consumer goods market in a socialist economy no such automatic mechanism operates to enforce the second causal relationship, from a rise in prices to the elimination of shortage.

A constant price level, a fall in price, and a rise in price are equally compatible with the permanent maintenance of the normal intensity of shortage. Norms of shortage are not eternal, but no price change, in either direction, can on its own alter them in the long run.

¹⁹Using the notation of section 19.4, the real targets g and x are adjusted to each other. But there is no macro-supply function $\kappa(P)$ that expresses a causal relationship from P to κ .

19.7. Differences in the intensity of shortage between product groups: The historical starting points

The account in sections 19.4–19.6, which aggregated the whole consumer goods market, was at a high level of abstraction neglecting the fact that different parts of the consumer goods market may be in essentially different states. In the remaining part of the chapter these divergences will be analyzed. As well as the short-term effects of relative prices we shall also discuss their long-term impact.

Table 19.1 illustrates our ideas. It has been based primarily on the Hungarian experience, but we think that it also holds for the consumer goods sector in a number of other Eastern European socialist countries. The table does not cover all consumer goods; we have only selected a few examples to support our assertions.

First we explain the meaning of column II. Here we compare the proportions of prices with the proportions of production costs. The price to the consumer of a group of products is called “medium” or “average”, if it covers production cost, and in addition brings in an average level of profit and state taxes. The price is called “low” in comparison with cost if it is considerably below the “medium” price; and it is called “high” if it is considerably above it.²⁰ Any product group can be classified in this way almost at a glance. Prices of the third and fourth groups yield a high net income for the state (turnover tax, customs duty, etc.), while to counterbalance the losses of the first and second product groups the state pays a large negative turnover tax or subsidy.

We would arrive at the same classification in our table if domestic relative prices were compared not with domestic costs, but with relative prices in any advanced capitalist country. The numerical values would, of course, be influenced by the price system of the country which we are comparing. But in each comparison bread and the rent of state-owned flats would seem relatively cheap, while cars and clothes would seem relatively expensive.

Although prices of the first and second product group are low, and those of the third and fourth product group are high, this classification *does not* coincide with the intensity of shortage, which is shown in column V of the

²⁰This is rather a rough definition, since it leaves open the exact method of “averaging”, as well as the question what we call a considerable difference from the mean. However, the present analysis does not require a finer classification. Whatever definition we might choose, prices of the first and second product groups would still be very low, and those of the third and fourth groups very high.

Table 19.1

Differences between product groups in price level and intensity of shortage according to groups of products.

I	II	III	IV	V
Product group	Price compared with cost	Is price effective?	Is the need satiable?	Intensity of shortage
1. Bread, milk, sugar and other staple foodstuffs for mass consumption	low	effective	yes	low
2. Tenancy of state-owned flat	low	not effective	no	high
3. Textiles and ready-to-wear clothes for mass consumption	high	effective	no	low or medium
4. Private cars	high	effective	no	high

table. Shortages could be eliminated in the first group of products, yet they continue permanently in the fourth group. This is a new empirical argument against the view that “shortage exists where relative prices are too low”.

The explanation of this phenomenon follows logically from what we said in Chapter 17 about satiation of needs, and in earlier parts of the present chapter about the connection between the price level, supply and shortage. Let us consider the four product groups selected for the table from this point of view.

First group. It is a well-known finding of demand theory that the need for basic foodstuffs is relatively easy to satisfy. Therefore, shortage can be eliminated despite low prices, provided that the production and imports of agricultural products grow satisfactorily.

Second group. Demand for housing is virtually insatiable. If the rent is not effective, shortage will necessarily become very intense and chronic. We shall deal in detail with rents and the housing shortage in the next section.

Third group. Prices of textiles and ready-to-wear clothes for mass consumption are high, which limits household demand. Supply has more or less adjusted to it. It is true that its actual composition, quality, and distribution over space and time leave much to be desired, so that there are shortages, as shown by search, forced substitution, and so on, yet the intensity of the shortage is not particularly high.

Fourth group. The price of private cars is high, and this restricts household demand. Yet supply lags permanently behind demand. Chronic queuing and years of waiting characterize this market. The supply increases from year to year, but only so as to maintain the *normal degree of shortage*. The example of the private car demonstrates very clearly for a *particular* market what we said about the *whole* consumer goods market in preceding sections. Once a normal degree of shortage has grown up and become established, supply can be determined—whether price is low or high—so that the normal intensity of shortage is continuously restored.²¹

Here we may make similar—but not identical—statements concerning *relative* prices within the consumer goods market as we made in the preceding sections concerning the *general* price level in the whole consumer goods market.

Within the limits of supply, the *household* demand responds to relative prices in a highly sensitive manner. (This was discussed in detail in Chapter 18.)

The commodity composition of what the firm supplies instantaneously or in the short run is fairly responsive to relative prices. (See section 14.6.)

Long-term supply, which depends—through the allocation of investment—partly on higher authorities and partly on the firm, is *indirectly* influenced by relative prices. They play some part in determining the composition of consumer demand in the long run and the planning of long-term supply takes this composition into account. It thus takes relative prices into account—but there is no automatic mechanism operating either centrally or at the firm level which forces the composition of supply in the long term to adjust to relative prices. This is proved in table 19.1. *The internal composition of supply on the one hand and relative prices of consumer goods on the other may remain unchanged for a long time, and this brings about a very uneven distribution of the normal intensity of the shortage in different markets.*

Table 19.1 raises another question. Why have low prices come into being for certain product groups and high prices for other groups? To answer this question we have to go back to the *historical starting-point*, i.e. the period in which these relative prices were established. The main proportions of the present Hungarian consumer price system were determined in 1946, in the course of stabilization following the great inflation, and they were revised thoroughly only once, a few years later. Several important

²¹See Footnote 6 to Chapter 6, where we quoted the statement of the director of the Hungarian car-importing firm.

minor modifications have been made since, but the main proportions still bear the mark of the price reforms of 1946 and 1951. Although many viewpoints were considered at the time, we here recall two main principles:

(i) Relative prices should reflect relative costs. Since calculations were disturbed by inflation, pre-war (1938) relative costs and consumer goods prices had to be used.

(ii) Deviations from relative costs are permissible or necessary in order to assert certain social preferences particularly over the redistribution of income. The idea was for goods satisfying basic needs to be made available cheaply. These include bread, milk, sugar, electricity, centrally allocated flats and the health service.

We do not think it is necessary to analyze today whether this second principle achieved a redistribution in favor of the majority of the population.²² It is enough to emphasize that the proportions of the price system which were then established on the basis of well considered principles *have become rigid* since. Let us examine from today's viewpoint the two principles applied at that time.

(i) Relative costs have obviously changed a lot. Let us just think of the four decades that separate us today from the cost and price proportions of 1938. As we shall see in the final section of the chapter, where prices are not easily administered, they have been continuously adjusted to match rising costs. On the other side, many prices which are easily administered – and therefore more firmly controlled – got stuck where they were set at the time.

(ii) Social preferences have also changed in several respects. Current economic policy is not likely to respond passively and indifferently to the spontaneous development of consumer demand, but to drive it in particular directions.²³ But these directions are different today, at a much higher level of real consumption, from what they were thirty years ago. To mention only one example, in our days when basic needs for food are satisfied for most people, there is no social interest requiring that overeating be encouraged by economic means. And yet state subsidies for many foodstuffs bring about this result.

Although relative costs as well as social preferences change continuously over time, rigidity and inertia prevent relative consumer goods prices from

²²Empirical material gathered so far does not clearly establish whether the policy for consumer goods prices fulfills the redistributive objectives originally set, or achieves the opposite result. On this dispute see articles by Ladányi (1975), Ersek (1976), and Ferge (1975a, b, 1978).

²³See Hoch (1977) and Hoch–John–J. Timár (1975).

*adjusting to new conditions.*²⁴ We should like to make it clear in what follows that this is *not* caused by a failure to recognize the problem, and not even by any particular rigidity or conservatism on the part of those making price policy. The reasons for the rigidity of prices are deeper. We shall illustrate our explanation of why the consumer price system has become rigid through a real example, the development of *housing rents*. In the following section we shall examine the interrelationship between rents and the housing shortage.

This question gives us the opportunity to *summarize* once more what we have to say about consumer goods prices as well as to analyze the reasons why prices become rigid. Of all the shortages in the consumer goods market, it is the shortage of urban housing that is the gravest and most distressing. All the problems discussed previously can be found here in a concentrated and very obvious form.

19.8. Housing shortages and rent

We stress again that we are selecting only a few problems from a huge number.²⁵ We do not put forward any suggestion for solving the problem, but only try to consider the consequences of implementing one or other of the policy alternatives which have emerged in the course of the dispute. It is an extremely difficult question, since economic consequences in the strict sense of the word are closely intertwined with social and political consequences and deeply influence the way of life of millions.

Many expect that the housing shortage will be eliminated by building an ever increasing number of state-owned flats—while keeping the rent of these houses at a nominal level. In our view *every effort directed at eliminating shortage on the supply side—while maintaining the nominal rent—is hopeless*. A shortage of bread can be eliminated despite its low price, since demand is satiable. In contrast demand for *housing is almost-insatiable*.²⁶ If everyone lived in a flat with at least two rooms, many would want one with at least three; people who have a flat might also like to have

²⁴See Vincze (1971).

²⁵In the recent past several important studies and discussion papers have appeared on this subject in Hungary. See, for example, Liska (1969), Konrád–Szelenyi (1969), Breitner (1976), Halmos (1977), Mihályi (1977, 1978) and Dániel (1978).

²⁶For satiation see section 17.2. A need is considered insatiable if, when productive forces have developed over decades as expected it cannot be satisfied to the point where the consumer would not want—*by his own will*—any more beyond a certain quantity, even if it is available *free*.

a summer house; people whose flats have an adequate number of rooms would like to have a larger home, better equipped and in a healthier and more beautiful environment. There are certainly quite a few people who would not leave their present home, even if they got a bigger and better one more cheaply. They cling to it because they are ill, old or simply do not want to move. But most people would be glad of an improvement in their housing conditions. Even countries much richer than Hungary are far from having a supply of housing such that only problems of furniture and keeping the house tidy make even the otherwise mobile majority of the population "voluntarily" restrict their demand independently of housing rents.²⁷

Others believe that the housing shortage can be eliminated by a considerable increase in the rent of state-owned flats. Although the extent of an increase would certainly influence the outcome, for our mental experiment we shall take only one case in which the new and higher level of rent satisfies the following criteria.

(a) The rent is *effective* in regard to the demand for the number, that is *quantity* of flats. This is the case if there are persons who live in, or apply for an independent flat if the rent is nominal but are unable or unwilling to pay an effective rent, and therefore voluntarily renounce their demand.²⁸ This rent therefore constrains demand to the number of flats available.

(b) Rents are *effectively differentiated* according to the *quality* of flats. This is the case if there are families which live in, or apply for a large and well equipped flat, with other qualitative advantages, if the extra rent is nominal but an effective difference in rents makes them renounce their original demand. They are willing to move voluntarily to flats which are less well equipped or have other qualitative disadvantages.

(c) As a result of the new level of rents household demand diminishes to such an extent that part of the stock of flats available (at least 2–3 percent) is no longer wanted. If the vacancies are not occupied by another sector, a *housing slack* will develop.

²⁷This is clearly proved by the *Swedish* experience for example. After the Second World War rents were fixed at a relatively low level. The inherited stock of flats was high, it had not been damaged in the War, and home-building started at the highest *per capita* rate in the world. Despite this, there was an intense housing shortage, with people queuing for years. It ceased only when the level of rents was suddenly raised, and the new rents became established. On this subject see Lindbeck (1967). Lindbeck mentions his previous study written in cooperation with Bentzel and Ståhl in Swedish, published in 1963. The Swedish housing situation and economists' disputes on the subject were surveyed by Dániel (1977b) in Hungarian.

²⁸For example they move to a subtenancy or co-tenancy or they stay with their family, contrary to their original intention, etc.

When we speak below of a "high" rent, we mean a level which corresponds to criteria (a), (b) and (c). The latter have been formulated exclusively in terms of the effect on *demand*. We have not discussed the relation between rents and the cost of maintaining or replacing the flats. (We shall revert to this later.)

The effects of introducing high rents for state-owned flats fall into four groups.

(1) *Short-term market effect on the household*. At this point we examine exclusively how the household as a buyer, an economic agent in the market, reacts to rent increases. ("Human" consequences will be discussed when we analyze the fourth group.)

We disregard the income effect of increased rents. This obviously depends on whether there is compensation through nominal wages. For example we can assume, for the purposes of our mental experiment, that the total yearly nominal income of the household sector increases by exactly as much as the yearly increase in rents. In other words the *ratio* of rents to other consumer goods prices has changed. (Moreover, a redistribution is also taking place which will also be examined in the fourth group of effects.)

For the time being we assume that administrative prohibitions prevent firms and nonprofit institutions from occupying the flats vacated by households. (This will be discussed with the second group of effects.)

The "short term" in this connection may be considered to be one or two years. In the housing sector fixed capital is extensive and durable; the ratio of the net increment added in one or two years to the existing stock is relatively small. Therefore, on the assumptions set out above a short-term market adjustment is approximately described by *the adjustment of household demand to the new higher rents – with the supply given*. Most people bring themselves to move only with difficulty. High rents, however, are an *economic force*. When we spoke about the criteria for effectiveness of rents we mentioned "voluntary" changes in demand. Action is voluntary in this case, of course, only in as much as the tenant does not move out of the flat in response to an administrative order, nor does he get the smaller or poorer flat through administrative rationing. The driving force is the household's hard budget constraint.

Sooner or later all moves are finished. After the transitional period of adjustment on the assumptions above the *housing shortage will in the short term cease to be intense*.

Of course, it may happen in the future as well that a person does not find exactly the flat which he wanted initially and carries out forced

substitution. He may also have to search and wait before he gets the selected flat. Therefore, not every component of the vector z of shortage indicators for the housing market is zero. This is the case because adjustment cannot be perfectly free from friction on this market. (Using the notation of Chapter 8: $w > 0$.) Yet the gravest signs of shortage—years of queuing—are eliminated. Since there is a housing slack, anybody can rent a flat without delay, provided that he is able and willing to pay the high rent and to undertake forced substitution if the flats which are vacant immediately do not suit his original ideas in every detail.

Does this situation remain, and will it become the *new normal state* of the market?

(2) *The “siphoning-off” effect of firms and nonprofit institutions.* It is not clear whether the temporary simplifying assumption made above, that administrative prohibitions prevent firms and nonprofit institutions from hiring the flats vacated by households, is satisfied in practice. If *there is no* such prohibition, the fall in household demand means that firms and nonprofit institutions, which are scarcely responsive to input prices, immediately pounce upon the vacated rooms. They are under pressure anyway because of the shortage of offices and they can easily pay the high rents which weigh heavily on the household.

And, if *there is* an administrative prohibition, it is not so easy to enforce it consistently. It is shown by Hungarian experience that despite administrative prohibitions the number of offices in buildings originally destined for private residence is growing. It would be particularly difficult to “protect” the slack—vacant premises waiting to be let—from firms and nonprofit institutions.

(3) *Long-run changes in relative proportions.* Let us assume that rents for state housing have been fixed at the new, higher level. In order to understand the problems arising in the long run we have to recall the train of thought of sections 19.4–19.6 with the restriction that it is now applied not to the whole of the consumer market, but only to part of it, i.e. the housing market.

In the long term the population’s nominal income increases and the demand for housing grows in parallel.²⁹ As households’ income increases they wish to rent more flats of larger size and better quality. Therefore, even if the primary effect of an increase in rent is to eliminate an intense shortage, the subsequent course of events depends on the growth of real

²⁹It probably grows *faster*. At least this is shown by the demand functions estimated on the data of advanced capitalist countries. Because of the chronic housing shortage, no unambiguous estimates can be made for the income elasticity of demand for housing from the statistical data of socialist countries.

supply. Do the growth and improvement in quality of the stock of state-owned flats keep pace with the growth of demand?

This *may* happen, but there is no automatic mechanism which guarantees that it will actually do so. Let us recall the example of private cars mentioned in table 19.1. Although they are expensive, and their supply is growing, nevertheless queuing with several years' wait has been retained, because supply consistently lags behind the growth of demand.

The growth of the stock of state-owned flats is controlled—subject to what real resources allow—by central planning. *This supply is not a determinate function of price, nor of the profit or loss derived as the difference between rent receipts and the costs of constructing and maintaining flats.* The state can switch income. It can take away net income from a highly profitable housing sector, or it can subsidize an unprofitable housing sector. That is why the new and high rents were not related to costs.

The following conclusion can be drawn from the above argument.

An effective, high rent is a condition for eliminating the intense shortage of housing. Yet effective, high rents do not guarantee that the intense housing shortage is permanently eliminated. What finally becomes the normal state of the housing market—an intense shortage or the elimination of shortage—depends on the state's supply policy as well as on the level of rents.

This supply policy cannot be made arbitrarily by the planners. The resources spent on state-owned housing are also wanted by other sectors, primarily for investment for growth. This suction effect of the other sectors may slow down the increase in the supply of state-owned housing. But we shall stop our train of thought at this point, since it would lead us far from our immediate subject: the rents.

Let us revert from the large, long-term macro-proportions of the economy to the direct “micro-consequences” of increased rents—the effect on people's lives.

4. *Redistributive effect.* In the short run the *total volume* of real consumption in the household sector decreases by the amount of the slack released. If this amounts to 2–3 percent, for example, it is not too much. In any case, in view of the chronic housing shortage the population has got so unaccustomed to the idea of a flat to rent that its mere existence would be amazing. In a big city of a million inhabitants, in which there are, say, 200,000 flats, this would mean that about 4,000–6,000 households, who had previously lived in separate flats, would be forced to move into flats shared with others.

The development of a slack would make it easier to change flats, since there would be no need to build up complicated chains of mutual transfer

of flats in order to be able to move. *The spatial mobility of society would grow*; people would no longer be “bound to the soil” by the housing shortage. These advantages, however, would be enjoyed not by those who have to give up a separate flat because of the increased rent, but by those who wish to move in the future, or who start a new household. Thus, a redistribution of advantages and losses would take place.

This is not the only redistributive effect. As noted earlier the general increase in rents, and their increased differentiation according to quality would lead to a large number of moves in either direction; some would move to bigger and better flats, others to smaller and worse ones.³⁰ Now let us take account of the fact that a flat is not just one of many goods such as clothes or the refrigerator. Housing conditions deeply affect people’s way of life, their family life, and cultural opportunities. Some people’s housing conditions improve with the redistribution while others’ conditions worsen. Let us consider the position of the latter. Many people are strongly attached to the home, the neighborhood, the surroundings to which they have grown accustomed. They are accustomed to live together only with the closer members of their family, or to live on their own, and now they would have to share a flat with other people. Therefore, the redistribution of flats may deeply disturb many people.

But the redistribution that would take place is not only of *flats* but also of *incomes*. In Eastern European socialist countries, including Hungary, a large *private sector* exists in housing. Privately owned family houses and condominium flats come into this category. Most of them are used by the owner himself, yet private leasing of premises (for example subtenancy or the letting of a privately owned house or flat to a tenant) also exists. Without going into a detailed comparison, we can say that the original builder of the privately owned house or flat (or, in case of a house built for sale, the buyer) had to pay the building costs at least. On the other hand, the tenant of a state-owned flat pays only a small part of the maintenance costs, since the rent is subsidized by the state. Those who have paid a nominal rent for a state-owned flat have been enjoying a considerable *consumer’s surplus* and they have effectively received a present from the state.³¹ The flat may have been allocated to them by a selection criterion that is socially acceptable, for example urgent need or merit. But they may

³⁰We have throughout left open the question of *what levels* of rent increase, and of differentiation by quality are proposed for our mental experiment. These depend on how many are prepared voluntarily to worsen their housing situation – not on administrative order, but by economic force – and how soon they would do so.

³¹On the consumer’s surplus associated with rationing, and the criteria used in rationing, see section 17.6.

also have got it through personal connections or corruption, or, as is even more common, they may have inherited it. Their parents may once have got a state-owned flat as a result of urgent need or on merit, or the parents or grandparents may have simply moved into the house at the time of the capitalist free market; later the house was nationalized so the children and grandchildren acquired the state-owned flat by birth. The right to a state-owned flat is transmitted by inheritance in the same way as a feudal estate. And the consumer's surplus is simultaneously transmitted from father to son, just as feudal rent used to be.

A general increase in rents would deprive the tenants of state-owned flats of this consumer's surplus. There are some who would feel that they have been deprived of a deserved advantage.³² Others would not even think about their entitlement to the benefit they enjoyed before, but would simply register the fact that they had incurred a financial loss.

As a result of the redistribution the positive correlation between the total financial income of a household and its housing conditions would grow much stronger. This would in fact correspond to the principle of distribution according to work. But the problem still remains, as to how far the distribution of money income is itself in harmony with the principle of distribution according to work under the given social conditions. And, of course, it is also debatable whether a flat is the kind of good that should be distributed according to work, or whether it is a basic necessity whose distribution should follow other distributional principles. One can ask for example whether children's housing conditions should be determined independently of their parents' earnings.

At this point we shall stop analyzing the redistributive consequences, even though quite a number of aspects have not even been touched upon. It should be clear, however, that an issue which at first sight is clearly economic (the level of rents) leads to *serious social, political and ethical problems*.

One thing is certain: any radical redistribution would upset public opinion. Those who gain by it may not even recognize their gain. If today's young people got used to not having to queue for a flat, later they would not regard it as a special advantage. But even those who recognize and enjoy today the benefit of a change are happy about it *quietly*. On the other hand, those who lose become embittered and may *give voice* to their feeling. That is why there is an understandable reluctance to change rents

³²Of course, the general increase in rents can be complemented by a system of individual *rent subsidies*. Such subsidies could be granted to those who are judged to be in need of it, or to deserve it. Of course, it is not certain that those granted such subsidy would be the same people as those who today receive the "present" of low rents from the state.

and, generally, to modify consumer goods prices thoroughly, because of the redistributive effects of such a change.

This leads us to an understanding of the phenomenon which we might call the *trap of price stability*. For the sake of price stability the state is reluctant to make continuous or even frequent *minor* price adjustments. People get used to stability, and after a time they even expect the government to guarantee it. Any important price increase gives rise to unrest. The more a system tries to prove that it can preserve price stability, and the more it publicizes this intention, the more the population expects it—and therefore people react even more nervously if a price increase does take place.

This is the background in public opinion to price rigidity. As a consequence of this rigidity—as mentioned in the preceding section—prices become detached from cost and from state preferences which operated when they were originally determined. For years no continuous small adjustments are made, and now a drastic change has become necessary. But that involves a shock the redistributive effects of which are almost incalculable and which may arouse sharp hostility in many. Therefore the economic leadership postpones the changes, but this makes the problem even more serious, as a price adjustment now would cause an even greater shock—and so on. The rent of state-owned flats is a typical example, but not the only one, of such frozen or rigid prices.

We have thus arrived at a new and important part of our answer to the questions, why the price level for certain groups of products is what it is. It is what it is because it was fixed there once—maybe one, maybe several decades ago. At the time there were serious reasons for setting it at exactly that level. And then the price fell into the “trap of price stability”. A *status quo* once established maintains itself. This does not mean that radical changes in prices cannot occur ever and under any conditions. So much is certain, however, that the changing of the relative consumer prices, fallen into the trap of price stability, involves a decision not only of economic but also of far-reaching political consequences.

19.9. Consumer prices which are not administered

Up to this point in the chapter we have analyzed government price policy. This is justified because the proportion of consumer goods covered by *administered prices* which are firmly controlled by the central price authority is very high—higher than is the case with the interfirm prices discussed in Chapter 15. Yet the role of the other two types of prices is considerable

here, too; these are *contract prices*, which are determined by voluntary agreement between seller and buyer, and *pseudoadministrative prices*, which are seemingly decided by the price authority but in fact fixed by the seller.³³

In the case of nonadministered prices for consumer goods similar tendencies *towards price-drift* operate as were described in sections 15.5–15.7 on interfirm prices. We do not wish to repeat what was said earlier, so at this point we shall describe only a few special features operating in the case of consumer goods. “Cost-push” may occur in this area too; true, the government’s price policy may intervene by altering turn-over taxes or subsidies. It may attempt to block the rise in costs by preventing it from pushing up consumer prices too. But cost-push will still make itself felt more or less. As regards “demand pull”, the more intense the shortage in a particular market, the more the buyer will himself push the price up perhaps out-bidding the prices offered by fellow buyers.

In sections 15.5 and 15.6 we pointed out that in the case of interfirm transactions, tendencies towards price-drift do not hit a financial constraint on the demand side. The situation is considerably different in the consumer goods sector. Here at the *micro*-level the budget constraint is hard for each household. The same thing can be said about the *macro*-level: the total nominal income of the household sector is firmly controlled by central economic policy. (See the chapter on wages, and particularly section 16.1.) It is not only the complaints of buyers, the hostile climate of opinion, and the interventions of the price authorities which counteract inflationary tendencies; the main obstacle is the restricted amount of money which the household sector can spend on consumer goods. Some buyers may be ready to push up the price of some product, but the instantaneous demand of all households for all commodities is limited by the cash in hand.

This does not mean, however, that restricting the amount of money in the hands of the household sector could by itself *stop* price rises if they are caused by other factors. Controlling the nominal incomes of households is *one* of the conditions for preventing inflationary price movement emerging and strengthening in the consumer goods market. But this is by no means sufficient in itself; other conditions must be fulfilled as well. Some have already been mentioned, and others we shall mention in the remainder of the book.

³³For a more detailed explanation of this classification see sections 15.2 and 15.3. This was connected with the discussion of measurement of the price level in section 15.4. What was said there is also valid for the measurement of the price level of consumer goods.

Money: Monetary and fiscal policy

20.1. Introduction

Our earlier analysis of the behavior of firms, nonprofit institutions and households, allows us to discuss some problems concerning money.¹ We do not aim for completeness; monetary theory has several aspects which we do not even touch on. We shall concentrate on a single question: to what extent does money play an active role in a socialist economy?

First of all we shall clarify what we mean by money being active.² *Money is active if the actual behavior of a decision-maker depends on the amount of money which he disposes of.*

Money is not confined to being *either active or passive*. Its degree of activity may be expressed on a continuous scale. There may be transitional stages between full activity and complete passivity.

There is a close relationship between the hardness of the budget constraint and how active money is. As a matter of fact, these are not two separate phenomena, but alternative descriptions of the same phenomenon. At the micro-level we find on the right-hand side of the budget constraint the money available to the micro-organization for spending, that is the part of the total national money supply allocated to the micro-organization and at its disposal. If the constraint is soft, and its value easily increased (i.e. if money available for spending adjusts to the given demand for money of the micro-organization on the left-hand side of the inequality) then money is passive. If, however, the constraint is hard and the left-hand side, that is the demand for money of the micro-organization, has to adapt to the given supply, then money is active. Accordingly, the degree of activity of money

¹There is an extensive literature on the role of money in Hungary. Among works by Hungarian authors I should like to single out those by Augusztinovics (1963), Faluúvegi (1976, 1977), Huszti (1971), Riesz (1970), and Tallós (1975a, b; 1976). I have drawn much on them in writing this chapter.

²Brus (1964) was very helpful in the formation of my ideas about the active and passive role of money.

reflects on the *macro*-level the totality of *micro*-phenomena (the statistical distribution of the hardness of the budget constraint). In section 13.6 we introduced indicators β to measure the hardness of the budget constraint: $\beta=0$ indicated a perfectly hard constraint. The softer the budget constraint, the larger the positive value of β . The same measure can be used to describe how active money is.

We do not discuss here the link between the domestic money supply of socialist countries and foreign exchange; thus we ignore among other things the problem of convertibility. But even if we examine money's role exclusively in the domestic economy, it may be observed that *money is not fully "convertible" even at home. Money is "labelled"*. The financial system sharply separates the money that may be used for paying wages from money to be spent on anything else both by firms and nonprofit institutions. (See section 16.1.) Similarly, the money which can be spent on current production is kept strictly separate from money that may be used for financing investment. The centralized banking system which continuously inspects all the monetary transactions of every firm and nonprofit institution, can establish whether the restrictions are observed. Of course there is a vast circulation of money between the three major sectors – firms, nonprofit institutions, and households – but all these transactions can only go through channels designated and checked by the financial system. Even if there are some loopholes in the rules, this does not fundamentally change the situation that money is not fully "convertible". Under these conditions we cannot make statements of general validity about how active money is, but we must deal separately with each sector or restricted "labelled" sphere in which money circulates.

The *household* has a hard budget constraint. (See section 18.1.) Accordingly, *within the household sector money is completely active. ($\beta=0$, or almost 0.)*

True, in formulating state economic policy for the household sector the starting point is *not* a plan for the money supply available to the households. The true starting points are plans for real household consumption, for the supply of commodities available for household purchases, and also the formulation of state economic policy for nominal wages and the consumer price level.³ The planners weigh up first of all how these variables are related to each other and to the other processes in the economy, production, investment and foreign trade. The credit available to households plays a relatively small role and its volume is rigorously

³See sections 15.7, 16.2, 16.5, 16.6 and 19.4–19.6.

planned. In addition, there are “labelled” credits: these may be spent only on constructing private housing, or only on certain consumer durables, and thus they can be matched item by item with the real supply of these goods.

From the variables listed above the total supply of money which should be made available to households can be derived. But, even though this is a magnitude derived in the course of planning, it still has an “independent life”, a role of its own in shaping economic processes. The planners carefully consider how much money the population will have at its disposal. In drawing up the annual plans for the operational implementation of economic policy, the planners attribute great importance to working out the so-called balance of “purchasing power”⁴ and “commodity supply”. In the final analysis it cannot be said that in planning the household sector the supply of money is adjusted to demand, nor the reverse, but these macro-estimates are worked out by the planners together, *adjusting them to each other*.

The situation of the sector comprising firms and nonprofit institutions is completely different. The budget constraints are here more or less soft ($\beta \geq 0$). (See Chapter 13 and section 14.11.) The degree of softness varies from country to country and from period to period. It has become somewhat harder since the reform of economic management compared with the traditional system. There is a difference also between the financing of current production and of investment. (The latter is softer.) But even when and where it plays a substantial role, *money has remained fairly passive in the sector comprising firms and nonprofit institutions*. Their actions are determined in the course of multilevel decision processes independently of the available money supply. These actions determine the demand for money. *The supply of money adjusts passively to money demand in the sector comprising firms and nonprofit institutions*.

It was not necessary in our statements above concerning the household sector to go into the details. But in the following sections it will be worthwhile investigating more closely whether money is active or passive in the sector comprising firms and nonprofit institutions. The order of discussion will be as follows.

In section 20.2 the *short-term* financing of firms will be discussed, while sections 20.3 and 20.4 will deal with the financing of investment—both by firms and nonprofit institutions—that is, *long-term* financing problems. Finally, section 20.5 will discuss some questions of the state budget.

⁴The concept of the “purchasing power of the population” used in planning practice is related to the concept of “total money supply available to households” used here. We do not dwell on the technical differences between the two terms.

20.2. Short-term financing of the firm

Let us begin with the *short-term* control processes of the socialist firm. The proportion of a firm's total working capital which is its own is different in the various socialist countries, and changes several times in the course of historical development. But it has always remained true everywhere that the firm is not capable of complete self-financing. In each country and in every period the firm is forced to cover part of its current expenditures from credit. Therefore, the most important question to clarify is under what conditions the firm can obtain short-term credit. In this context too the real problem is not the officially declared principles and rules for granting credit, but the *actual practice*.⁵

In Chapter 13, when speaking about the hardness of the budget constraint of the firm, we underlined the question of whether the credit system is "hard" or "soft". Observation of practical experience suggests the following proposition.

*The system of short-term credits granted to firms is "soft".*⁶ The total of these credits is not limited from above by any rigid and effective constraint. As a matter of fact, the total supply of short-term credit adjusts passively to credit demanded by firms.

The firms demand for credit is not infinite: it displays some self-restraint. In our opinion, the reason is not that interest has to be paid on credit. *Interest as the cost of credit is not an effective price; it does not cause the firm to restrict its demand for credit voluntarily.* A possible increase in the interest burden – like other increases in costs – can usually be shifted by the firm to the buyer or to the state budget sooner or later. (See Chapters 13 and 15.) It can be empirically verified that *the firm's demand for credit is not responsive to the interest rate*.⁷

The "self-restraint" in demand for credit is explained rather by the mere fact that credit *has to be asked for*. Not only the firm, but also the bank knows that interest does not much matter from the firm's viewpoint. Therefore, getting credit is not a simple business transaction between two partners of equal rank. Neither of the parties feels that by paying interest

⁵According to Huszti (1971, p.41) "...the semiautomatic nature of credit and the creation of excess money were not the consequence of a deliberate financial and credit policy. On the contrary, the expansion of credit and its semiautomatic nature came about in spite of the definite intentions of financial and credit policy-makers."

⁶A witty description of the situation is given by Riesz (1964): "...the Bank is a 'money-manufacturing firm' which cannot deny its 'service' to clients 'with a ration', and which is sometimes obliged to deliver even to those 'not having a ration:'"

⁷See Tallós (1976, p. 221).

the debtor has paid for a service provided by the creditor. Credit is somehow a favor (even though it has to be repaid with interest). The more so, for as there is always abundant demand for credit, the bank is never in trouble over how to place the money waiting to be lent. The credit market is a sellers' market; those seeking credit queue up in front of those granting it. To use the terminology of Chapter 17, credit is distributed not through an auction but by rationing. And it is uncomfortable to ask for something, even if the firm believes the credit is *due* to it. Therefore a certain relationship of superordination and subordination develops between the central bank and the firm.

Since the reform of economic management the role of the bank has increased. The granting of credit is more closely linked to changes in the firm's stocks of inputs and outputs. But even in the postreform situation it is true that a well explained application for credit is always accepted.

Our statement relating to the "softness", or passive nature, of the short-term financing system cannot be verified merely through logical reasoning. It is a hypothesis requiring empirical testing. This may be done indirectly, by verifying various partial statements.

(1) The most important is to observe the actual behavior of the firm in making purchases necessary for current production. The most expedient way of empirical testing would be to obtain, using questionnaires, personal interviews, case studies, answers from a satisfactorily representative sample to these questions:

"Has it ever happened that the firm has needed some input which was available and which the firm would willingly have bought, yet it did not buy only because it had no money? If so, how frequently has it happened, and how important were those items?"

Our hypothesis is that – with rare and insignificant exceptions – this does not happen. As regards the *demand for credit*, with the chronic shortage of inputs and the uncertainties over their delivery, even a firm interested in profitability expects to suffer a much bigger loss by leaving a purchasing opportunity unexploited than by paying interest charged on credit. And as regards the *supply of credit*, the existence of a supply of real inputs and the using firm's intention to purchase are usually enough justification for the bank to grant credit for the transaction, if it cannot be financed from the firm's own funds. The granting of credit may be preceded by some bargaining. The firm may have to argue and resort to its "connections", but in the end it usually succeeds in getting credit.

Highly important conclusions follow from this simple observation. Let us recall Chapter 2 of the book, where we classified economic systems into

two major abstract classes, demand-constrained and resource-constrained systems. In a demand-constrained system the quantity of money in the hands of an individual buyer sets an *effective* upper constraint to its total purchases. *In a resource-constrained system money in the hands of the buyer is not an effective constraint.* The latter buys as much as he *gets* from the given physical supply, not as much as he has money for.⁸ If he can get what he wants, he is always able to acquire the finance for it. This is why resources in the system are utilized up to the upper limits by the bottlenecks.⁹

(2) Another indirect symptom of the “softness” of the system of short-term financing is the proliferation of interfirm credits.¹⁰ If the firm gets into a financial squeeze, it puts off paying the firm from which it bought inputs.

In the traditional system of economic management the central bank had a strict monopoly in short-term credit: firms were not allowed to grant each other credit. It was the bank itself which pursued a passive credit policy, always adjusting the supply of credit to the demand for it induced by the drive for quantity. After the reforms this credit monopoly becomes looser. *Even if the bank wanted to pursue a restrictive policy, insisting on the planned supply of credit, firms may help themselves by tolerating indebtedness towards one another.* In the last resort, they can do so at no particular risk since, as we shall see in paragraph (3), none of them is menaced by financial catastrophe.

The expansion of interfirm credit is an empirically observable tendency. It has a double effect. On the one hand it makes the flow of money accompanying the flow of real inputs more flexible. On the other it allows the firm to increase or restrict its indebtedness, without being compelled to turn to the bank.

(3) A third and final indirect method of empirical testing may be to observe whether general insolvency, or financial failure can happen to a firm.

⁸An essential qualification should be added to the above. All that has been said relates to the active or passive role of the *domestic* currency necessary for buying inputs of *domestic origin*, and not to the *foreign exchange* necessary for buying *foreign inputs*. The control of expenditure with foreign exchange will not be discussed here.

As in other parts of the book, we are not in a position to discuss here in detail the special problems of foreign trade.

⁹We need not repeat the idea explained in detail in Part I, that while the system continuously hits real resource bottlenecks and, *in this sense*, goes to the upper limit of utilization, there are always unused complementary inputs left over as well. Thus here shortage and slack coexist.

¹⁰See Tallós (1976).

The traditional system of economic management did not tolerate this even in its declared principles, and automatically averted even partial insolvency. The so-called “forced credit” was a familiar pattern. If the firm became momentarily insolvent, it *had to* raise credit in order to be able to pay the suppliers of its inputs. With the aid of “forced credit” the bank prevented the insolvency spilling over to other firms.

The postreform system of management has not maintained the principle of “forced credit” in a declared form, but continues to practise it to a large extent. As we explained in detail in Chapter 13, complete insolvency or true and final bankruptcy almost never occurs.

20.3. Financing investment

Let us now turn to *long-term* financing of investments.¹¹ There will unavoidably be some overlap with Chapters 9, 10, 13 and 14, where investment was treated from a different aspect. Now, in the interest of a systematic survey of the issues related to *money*, several problems of investment have to be mentioned again.

Firms and nonprofit institutions will be discussed together here. There are, of course, differences between them. With unimportant exceptions, the nonprofit institutions cannot use their own savings for investment purposes. In contrast firms may use a part of their savings to finance investments. The share of self-financing in total investment by the firm sector varies by period, country and sector. In the traditional system of economic management this share is very low; it grew after the reform. But even in postreform Hungary, where investment decisions and financing have become considerably decentralized, the share of investment financed *exclusively* from the firm’s own resources is still rather small. Other investments are either financed exclusively from long-term credit and/or contributions from the state budget, or the firm’s own resources are complemented by different forms of credit and/or state support. Thus, the situation of the two sectors is similar in that the *investment is overwhelmingly (or almost exclusively) financed with central financial resources*. This similarity justifies our discussing them together in the present section.

The first impression we get of the multilevel process of determining and controlling investments is the following: the firm or nonprofit institution

¹¹See A. Deák (1975, 1978 a, b), Soós (1975a, b) and Bukta (1974).

asks for *money*; it asks the allocator¹² *who distributes money*. It seems as if the bargaining were about money: the firm or nonprofit institution asks for 150 millions, the allocator initially wants to give only 110 millions, and they finally agree on 125 or 140 millions. The authority playing the role of allocator at some level gives the impression of strictly insisting on distributing no more than it has at its disposal.

However, this is only a superficial impression: *a particular kind of "money illusion" in the multilevel process of determining and controlling investment. Behind the veil of money we find in reality "quantity" control processes.*¹³ *It seems as if the allocator distributes money, whereas in fact he gives permission to embark upon definite real actions. If the real action has started, the money expenditure accompanying it may far exceed the originally permitted cost limit. The budget constraint on investment is soft.*

Of course, we do not allege that there is no link between the original financial budget allocated *ex ante* and the actual *ex post* cost of the investment. To a certain extent the preliminary cost estimates orientate the executants during implementation. But they at most influence them and do not set an effective and hard constraint to expenditure. What we said above concerning the short-time financing of firms applies even more to investments: *money plays only a passive role.*

Our statements may indirectly be tested empirically by proving a few partial hypotheses to be set out below.

(1) The most important thing is to observe the implementation of investment. As in the case of the partial hypothesis mentioned in paragraph (1) of the preceding section, using interviews, questionnaires and case studies we can seek an answer to the following question for an appropriate representative sample:

"In the course of some state-approved investment project which has actually started, has it ever happened that an input which was necessary and of domestic origin¹⁴ (for example construction capacity, home-produced machinery, labor, etc.) was available on the supply side, the intention to buy

¹²For an explanation of the concept of an "allocator" see Chapter 9.

In the *traditional* system of economic management the allocator distributes an *investment quota*; the higher-level authority gives a quota to the middle level authority, the latter to the lower level authority, etc. In the *postreform* system, the task of the allocator is performed when the higher authority which decides on state support or by the bank which grants credit, approves the *total investment budget*.

¹³The problem was mentioned in section 9.3.

¹⁴Here we should like to repeat the restriction mentioned in the preceding section. We only discuss purchases of inputs of domestic origin. The investor naturally pays for these in domestic currency. The budget constraint on expenditures in foreign exchange may be much harder. But, as in the preceding section, we cannot discuss these issues here.

existed on the part of the investor and yet the purchase did not take place merely because the investor had no money for the purchase? If so, how frequently has it happened and how important were the items concerned?"

It is our hypothesis that such events almost never occur, and if they do only relatively unimportant items are affected. A thousand times the complaint is heard that money is available, but not the construction capacity necessary to implement the project, or there is no material, or machinery, or labor. But once the starting-gun for an investment has been fired, one never (or almost never) hears the opposite complaint that construction capacity, machinery, materials and labor are available, but not money. Money can always be procured.

(2) How the investor acquires money, should he meet with financing difficulties in the course of the investment, can be empirically observed. Although the methods are various, the three most important ones will be emphasized.

(a) The most obvious method is *rescheduling over time*. If necessary, the money which, it was expected, would only be spent later, can be spent sooner.

When provision is made for state aid or credit to be given to investments which are not exclusively financed from a firm's internal resources and, when the budget of the investment project is approved, a time schedule for the aid or credit is usually given. But the investor can bring the expenditure forward without any difficulty, if an input (which may perhaps be needed only later) is available at the present moment.

Let us denote the *ex ante* sequence of cost estimates for the i th investment project started or in progress in year t by $K_i(t)$, $K_i(t+1)$, ..., $K_i(t+T_i)$, where $(t+T_i)$ is the expected date of completion. These are not the original targets, but plan figures recomputed on the basis of an up-dated schedule for spending the remaining money, after deduction of actual expenditure up to year t .

Let us denote by $I(t)$ the set of all investment projects which are started or in progress in year t .

According to the time schedules broken down by years *investment expenditure due* in year t is

$$\sum_{i \in I(t)} K_i(t).$$

At the same time the investor *feels*, and this feeling is confirmed by experience, that in reality he disposes of the *total* unspent investment budget. Let us denote *estimated economy-wide total of unspent investment*

funds by $K(t)$:

$$K(t) = \sum_{i \in I(t)} \sum_{h=t}^{t+T_i} K_i(h). \quad (20.1)$$

estimated total un- spent in- vestment	summation over invest- ment projects in progress	summation over remaining years of the project	estimated cost of investment in year h
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Of course, it is impossible to spend the whole amount $K(t)$ in year t . Only a small part is spent because the *supply* of real goods is limited. *But on the demand side the whole amount $K(t)$ of unspent money is on the increase.* This phenomenon would perhaps be enough in itself to explain why solvency almost never sets an effective upper bound on purchases of inputs, or to selling the investment goods. If the real supply were there, and if it were not absorbed by the investment demand

$$\sum_{i \in I(t)} K_i(t)$$

due in year t , there is always a buyer who is capable of *bringing forward* some credit or the state support originally due for years $(t+1), (t+2), \dots$

(b) The investor, as in the case of short-term financing by the firm, may run into debt with the firm supplying the investment goods and thereby ease its immediate payment difficulties.

(c) The investor may ask for an increase in the originally permitted credit quota or state subsidy, if costs prove higher than planned. This request is virtually always heeded. This is shown by the statistically testable observation that the overwhelming majority of investment projects exceed the original cost estimate to a greater or lesser extent and a considerable number greatly exceeds the estimate.

Many investors use methods (a) and (c) in combination. At the start of implementation they apply method (a), that is to say they “stay” within the originally approved budget, but perhaps bring forward financial resources to cover the increase in costs. In the meantime the project goes ahead. The nearer it is to completion, the more absurd it seems to the authorities to stop the project because the original cost limit has been overrun. Then the investor – and also the bank and the state budget too – are already “running after their money”. Therefore, the bank and/or the state budget take upon themselves the task of making up the original estimate, and foot the bill.

In paragraph (1) we asked whether it ever happens that an investor fails to purchase some input merely because he has no money, and we answered in the negative. Now, this may be complemented in the framework of the empirical analysis by a more general question: *has an investment project ever been completely stopped because the original budget has been exhausted? On the basis of observations up to now the answer is clearly negative: it never happens.* True, the shortage phenomena in the procurement of inputs and adjustment frictions may slow down implementation. In the restrictive phase of the investment cycle economic control may interfere and force a slowdown of the project. It sometimes even happens that the work is temporarily interrupted. However, the project is finally completed sooner or later.

This is why, spurred by the hunger for investment, firms and nonprofit institutions intending to invest always concentrate on getting permission at the actual start of the project and do not bother much about the cost limit prescribed. They realize that they will sooner or later exceed the limit.

(3) The third indirect way of making an empirical test is by investigating the subsequent financial results of the new project realized through the investment. This problem has already been discussed in detail in sections 13.8 and 14.8. Here we only recall the statements made there. *The fact that – in a financial sense – a true investment failure never occurs shows that money is passive.*

We do not allege that there are no mistaken investment decisions and no investments implemented in a disorganized and costly manner. Of course, critical remarks are made after some of the less successful investment projects. It may even happen that sanctions are applied against the *persons* responsible for a mistaken decision or poor implementation.¹⁵ But the investment as an *economic act* automatically “justifies itself”. It *always* “pays” because, whatever the costs in money terms and the financial return, these are sooner or later adjusted to one another so that the investment does not finally lead to insolvency or bankruptcy.

And here we have reached a basic question related to the passivity of money. In an earlier part of the book we explained *that one of the deepest and strongest intrinsic tendencies of a resource-constrained system is its*

¹⁵But this is a rather rare occurrence. Many institutions at higher or lower levels in the hierarchy take part both in preparatory work for an investment decision and in decision-making itself. This also holds for implementation. Usually it is almost impossible unambiguously to identify who has been responsible for either the success or failure of a project. The institutions and individuals participating in taking the decision and implementing it are not interested in clarifying responsibility.

*unstoppable drive for expansion which generates an insatiable hunger for investment. Restricting the money supply is never an obstacle to this expansion.*¹⁶

It is worth while recalling here the Keynesian macro-analysis of the investment decision in a capitalist economy. The risk of the investment is the main restraining force which causes the capitalist investor to be cautious. If investment failure is possible which may cause profit to fall short of the expected level or even leads to loss of a part of the capital invested, the money holder will think twice before investing his money in that project. The insufficiency of investment may be one of the main reasons why the level of aggregate demand is insufficient to ensure full employment. For this reason the potential investors have to be encouraged to make investments. This is done, among other ways, by Keynesian economic policy: interest and credit policy intended to increase investment, governmental investment to boost production, development of an "optimistic" atmosphere. In a general upswing the individual entrepreneur will become more and more confident that it is worth his while to invest.

In a socialist economy it is not necessary to create an "optimistic atmosphere" because this is automatically assured. There is absolute assurance of risk-free investment. Therefore, there are no factors holding back the initiator of an investment project.

To sum up, *in a socialist economy the supply of money does not restrict nor control real expansion. The ever-increasing demand for money created by real expansion is satisfied by increases in the money supply which take place without any resistance.*

20.4. Saving and investment

In the context of investment financing we should also make some observations about the interrelationship between *investment and saving*. We do not consider it our task to clarify the *ex post accounting identity* between the money savings in a period and investment in the same period, if suitable definitions are chosen for these two categories.¹⁷ While we acknowledge that the investigation of this identity is an important problem of national

¹⁶This is well characterized by a quotation. According to the Hungarian Investment Bank, the 1957 investment plan for Hungary has to be raised: "...as we could not restrict investment activity to the necessary extent, we were compelled to expand the finance available". (Quoted by Ungvárszki, 1976, p.122.)

¹⁷For details of the Hungarian accounting system see Arvay (1973, pp. 235–237).

accounting, its analysis lies beyond the scope of this book. What does belong here is the *casual* relationship between the two groups of phenomena. We seek an answer to the following question: *what is the impact of the stock of money accumulated by savings in one period on investment intentions in the next?* It is all the more justifiable to raise this question since the economists concerned with the finances of socialist economies often ask what accumulated sources of money the credit system is “allowed” to use in granting long-term credit. We consider that it is not our task to answer this latter question, the less so since it is doubtful whether the question itself has been correctly asked. We approach the topics entirely in a *descriptive manner*. We shall formulate the following hypotheses which require empirical testing.

Let us first approach the problem on the *micro-level*. In the *traditional* system of economic management, the firm is neither able to accumulate, nor is it interested in accumulating money savings to finance its investment.

The situation has somewhat changed in the *postreform* management system. The firm is entitled to use a part of its savings out of profit for investment. Some investment projects are wholly financed by the firm’s own saving,¹⁸ in others such savings are complemented by long-term bank credit or government aid.

Even if there is a positive relationship between saving and investment, it may be counteracted by countervailing effects. An investment project financed from credit or an allocation from the state budget may also be implemented in an industry or firm, where *no* money savings have been accumulated. It seems—though this requires still further empirical checking—that the proportion of such investments is large. Therefore, in the final analysis, *there appears to be no substantial positive correlation between the allocation of investments between industries or firms and the accumulation of savings in money in those industries and firms.*

A similar claim can be made about the *temporal relationship* on the macro-level between accumulation of savings in an earlier period and the investment intentions for the future. Investment intentions and their implementation have *their own law of motion* which is independent of earlier accumulations of savings. While the basic tendency of these two variables

¹⁸The firm uses its savings for its *own* investments even if it is more profitable to invest them through the banking system in other firms. As has been mentioned, the firm is not particularly bothered by interest charges. And, symmetrically the firm is not keen to receive the interest payments on its bank deposit, either. It is felt to be more important to expand its own plant even at a lower rate of return, than to earn interest on a savings deposit by lending.

is expansionary, they accelerate and decelerate, perhaps with cyclical fluctuations. There are several variables which can explain the fluctuations, as we made clear in section 9.10, but changes in money stocks occurring as a result of the accumulation of savings that may be used for investment purposes do *not* belong to the explanatory variables. If the investment activity increases and there is not enough money to finance it, the necessary additional money will be *created* by the financial system. If the investment activity slows down or comes to a stop, the money supply may grow more slowly. Stocks of money may temporarily increase. But both increases and decreases are only the passive reflection of fluctuations of investment intentions in the control sphere and realizations in the real sphere; they are not the cause of these fluctuations.

Two brief detours will be made here. The first is a *theoretical remark or rather a remark on the history of economic thought*. In literature discussing the capitalist economy the nature of the casual relationship between investment, savings and profit has been a much debated question. The standpoints of Kalecki, Keynes, Kaldor and, in the Hungarian literature, the view of P. Erdős,¹⁹ are close to each other in that *the main explanatory variable is investment*. It is *real* investment activity that plays the primary role. The *financial* resources from which the real investment activity can be financed will automatically be created by monetary factors or changes in income distribution.

I do not wish to take a stand on the extent to which these theories hold if applied to a *capitalist* economy. But it is certainly true for a socialist economy that *real investment is the primary factor and the availability of finance is a secondary phenomenon*; the former is the cause and the latter the effect. This can also be expressed by saying that the financial resources play a passive role, adjusting to the demand for money brought about by the real investment activity. But a qualification must be added.

In its normal state the capitalist economy is *demand-constrained*. Its expansion is limited by the caution of the investing entrepreneurs, over whether they will succeed in finding a profitable market for the increased output resulting from the investment. The system does not expand up to the physical limits of the resource constraints. Apart from exceptional cases, there is always some mobilizable real slack, which provides the physical possibility for further expansion. This is why – justly – the impression may arise that the rate of growth *depends only on the propensity to invest*. And however large this is it will never be infeasible. In fact, the

¹⁹See Kalecki (1964), Keynes (1936a, b), Kaldor (1960a, 1960b), and P. Erdős (1976).

greater is real investment, the higher are profits too, so that the financial sources of investment, from which even more real investment can be financed themselves increase, and so on.

The situation is different in a socialist economy, which is *resource-constrained*. The investment intentions, and growth aspirations of firms, non-profit institutions, and medium- and high-level superior authorities are almost-insatiable; they always exceed the physical resource constraints of the system. True, there is no financial constraint here either; money can be always created. But investment cannot take place at any level because—in the course of cyclical fluctuations—it hits against the physical constraints and tolerance limits of the system again and again.²⁰

The other detour leads us to the *household sector*. Although in section 20.1 we announced that we will not deal with households at all in sections 20.2–20.5, we make now an exception and briefly dwell on the relationship between *savings and investment in the household sector*.

We do not wish to enter into a terminological debate about what should be called “investment” in this connection. The consumer who is not an economist frequently calls the acquisition of durable goods an investment, particularly if he buys or builds a flat or house, or acquires a car, furniture, refrigerator, TV set, and so on. We shall adopt this usage here without precisely defining the concept.

For a micro-organization in isolation, the interrelation is obvious: the household is in a position to spend the stock of money accumulated from its savings²¹ on household investment. What is problematic is the redistribution of savings among households. A minority of accumulated household savings is in the form of cash in the hands of the population, the majority takes the form of savings deposits with the state bank system. The bank can lend this stock of deposits as short-, medium- or long-term credits to households. In this context we may make the following empirical observation.

There is no automatic rule which prescribes the relationship between the consumer credit that can be granted, or is granted, to households and the deposits created by households. The ratio is determined by the government's credit policy. A considerable part of the household savings flows into other sectors.

²⁰See the description of the investment cycle in section 9.10; see also Bródy (1980).

²¹For lack of space we cannot discuss the financing of investment in the *private productive sector* operating in a socialist economy. A private artisan can decide whether to spend his savings on “household investment” (building a house, for example) or on “productive investment” (purchasing a new machine, for example). But the bulk of households have no such choice.

20.5. Surplus or deficit in the state budget

We do not consider it our task to describe the structure of the budget in a socialist state.²² We shall only discuss the role of the equilibrium, deficit or surplus of the state budget in the creation of *general chronic shortage*.²³

As a first approximation we might say that *there is no unequivocal or necessary causal relationship between the balance in the state budget and the intensity of general shortage in a resource-constrained economy (i.e. shortages of productive inputs, labor, investment resources, consumer goods and services)*.

Many people believe that a budgetary deficit necessarily increases the general shortage. But this is not so. In the traditional system of economic management care was taken to ensure that the state budget was not in deficit, and even showed a surplus. At that time it was a widely held belief that a budget surplus is some kind of immanent law of a socialist economy. At the same time, it is common knowledge that in the period of traditional economic management shortage was very intense in most fields of production and consumption. The reverse phenomenon may also be observed. In some socialist countries state budgets provide *ex ante* for a budgetary deficit, and even exceed that deficit *ex post*, yet at the same time shortage diminishes in several spheres. Of course, we do not draw from these observations the conclusion that the causal relationship is a negative one. This only proves that there is no unequivocal causal relationship between two groups of phenomena whose direction and sign can be determined from the outset.

Expansion of economic activity is accompanied by expansion of total credit. On the macro-level the relationship of these two processes influences the general level of utilization of resources.²⁴ But it does not much matter whether the liabilities of the state increase faster and those of the firms more slowly, or conversely. In the process of "money-creation" indebtedness on someone's part is inevitable. The essential question is the extent to which activities directly financed from the state budget and the other activities financed from outside the budget compete for real resources. To what extent do they utilize the social capacity?—to use the term introduced in Chapter 12. Let us return to fig. 12.3, which we

²²This description may be found in the works listed in footnote 1 to this chapter.

²³The study by Bognár–Riesz–Schmidt (1976) contains remarkable ideas on this topic; see also Hagelmayer (1976) and Riesz (1976).

²⁴It does not control it unequivocally, but only influences it.

reproduce as fig. 20.1. It shows the U-shaped curve of social marginal costs as a function of the utilization of social capacity. The system comes into the steeply rising segment of the U-shaped curve, if the total of current production, current public consumption, household consumption and total investment, financed from all sources, *jointly* generates a level of initial demand which goes almost to infinity and is constrained only by the available real resources which create physical bottlenecks, and by social tolerance limits. This situation may occur with either a positive or a negative balance in the state budget.

The high utilization of social capacity, the “overheated” state of the system, and the frequency and intensity of the shortage phenomena depend not on the instantaneous ratio between the receipts and expenditures of the largest money-holder, the state. The intensity of chronic shortage depends on the relationship between intended uses of real inputs and the quantity of real inputs actually available. Since over a wide sphere of the economy these intentions are not limited by a hard monetary budget constraint, intentions will get out of hand and increase until they strike really hard physical constraints on the possible opposition of the participants of the system, who establish tolerance limits for utilization.

Our remarks are not general statements about the role of the balance in any state budget. We speak here about the kind of state budget, which appears in a *semimonetized economic system*, comprising a *monetized* subsystem where the budget constraint is hard and a *pseudomonetized* subsystem where it is soft.

The question now arises of whether the central state budget is itself subject to a “hard” or a “soft” budget constraint. In our opinion, it cannot be unequivocally put into either of these categories.²⁵ Once the state budget has been approved, with several items—particularly as regards the current government expenditure—financial discipline is rigorously enforced and exceeding the estimates is prevented. *To this extent the constraint is hard.* But it appears *to be soft and ineffective* in the following respects.

(a) With investments covered or supported by the state budget, there is usually an inclination to pay for cost increases above the planned level. (See section 20.3)

(b) The state budget is responsible for compensating some firms for losses, keeping some prices at a low level by covering part of the costs, and

²⁵We touched on this problem at the *micro*-level when we discussed the behavior of the budget-financed nonprofit institution in section 14.11. We are dealing with the state budget which finances most nonprofit institutions and includes much other expenditure as well.

subsidizing some unprofitable foreign trade transactions, and so on. If firms' budget constraints are to be rather soft, the central constraint may have to be softened.

(c) It is up to the "self-restraint" or "self-discipline" of the central economic leadership whether it observes or exceeds the predetermined balance. There are no built-in legal or political sanctions. Should the financial situation develop so that the actual deficit is larger than the planned one, the central bank finances the excess. The bank is subordinate to the same authorities which supervise the observation or transgression of the planned budget balance.

20.6. An echo of the debate between Keynesianism and monetarism

The polemics between the Keynesians and monetarists in the advanced capitalist countries find an echo²⁶ in the discussions between Hungarian economists over whether a deficit in the state budget is permissible. This book does not take a stand over who is right and who is wrong as regards the *capitalist* economy. My remarks apply exclusively to the *socialist* economy.

Some participants in the debate in Hungary are well acquainted with the views of Keynes and Friedman, and the literature on the subject; others have only second-hand information. But we are not interested in whether some Hungarian participants in the discussion are consciously or unconsciously Keynesians or Friedmanites, nor in whether they have adopted, plagiarized, or independently "re-discovered" various elements in the Western debates. We comment only on the content of the debate. To illuminate our argument, fig. 12.3 will be reproduced and supplemented. It will now be called fig. 20.1. A detailed explanation is to be found in Chapter 12, and is not repeated here.

The curve illustrates a representative element of the social costs, as a function of utilization of social capacity. As we explained in detail in Chapter 12, the first derivative of most social costs (whether measurable or not measurable in money terms) can be represented by a U-shaped curve; that is, it first diminishes and then grows at an increasing rate as capacity utilization goes up.

²⁶For the monetarist viewpoint see particularly Friedman (1953, 1968, 1975, 1977b). For the Keynesian one see Tobin (1970b, 1972). For a summary review see, for example, the article by Laidler and Parkin (1975).

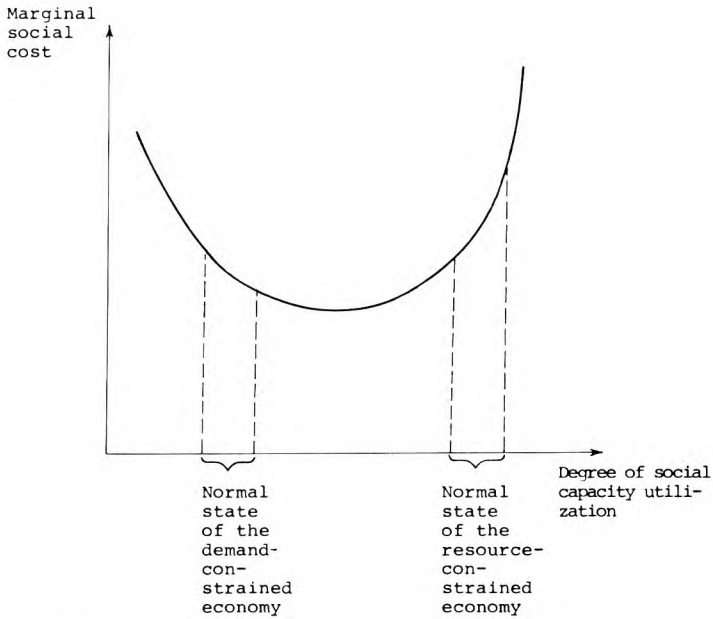


Figure 20.1. Two kinds of normal utilization of social capacity.

When Keynesian ideas first made their appearance, the normal state of the capitalist economy was to be at the descending part of the U-shaped curve. They were characterized by unemployment, unutilized fixed capital, and accumulating inventories. Mobilizable slack in the economy had much increased, that is complementary inputs were available to be utilized. Keynes and his followers elaborated recommendations for increasing aggregate demand. One of the ways of doing so may be to increase government expenditure (particularly investment expenditure), without reducing other components of aggregate demand through higher tax rates. This is why a budget deficit is permissible, and even desirable, provided that it contributes to increasing employment, and a better utilization of social capacity.

It is a grotesque mixing up of time and place to bring up this Keynesian reasoning in an economy where there is no unemployment but a chronic labor shortage; which is characterized not by a large mobilizable slack, but by overheating and chronic shortage phenomena. The normal state of such an economy, as shown in the figure, is on the rising part of the U-shaped curve.

It is true, as we emphasized in the preceding section, that the sign of the balance in the state budget does not *in itself* determine whether shortage increases or decreases in intensity, or whether we move left or right on the U-curve. But, *ceteris paribus*, the direction and size of the balance in the budget are not immaterial. Let us make a simple mental experiment. The following are *given*: (i) the availability of real resources; (ii) the initial level of demand in all other sectors outside the state budget; (iii) the receipts of the state budget and, finally, (iv) the price level. Thus, the only free variable in the system is the expenditure side of the state budget. *In this case* the level of demand induced by state budget does matter. An increase in government spending will—on the above assumptions—push the utilization of social capacity further to the right, where marginal social costs rise even more steeply.

Of course, reality never abides by the principle of *ceteris paribus*. Thus, we do not say that an increase in the budget deficit *necessarily* means that shortage becomes more intense, that bottlenecks are encountered with growing frequency, and that marginal social costs rise more steeply. We can only say that it is absurd to apply the Keynesian ideas about a budgetary deficit to an overheated economy operating with a high rate of utilization of social capacity on the rising part of the U-shaped curve and struggling with labor shortage. As a matter of fact, the normal state of a shortage economy is a “hyper-Keynesian” state, with a permanent drive for expansion, an insatiable hunger for investment, and with almost-insatiable demand. This system certainly does not need further Keynesian injections.

Do “Friedmanite” conclusions follow from this? In the Hungarian debates a view emerged that “there is too much money”, that this is why investment tension exists; and perhaps this is why a shortage economy has developed. In my opinion this view is not valid. It describes a *phenomenon* only but does not provide a satisfactory *causal* explanation. As has been emphasized, the system is only a semimonetized one. In a very wide field—above all in the firm sector—money is only a passive means of account, and not an active shaper of actions. *There are profound institutional reasons why the budget constraint in this sector cannot become hard.* In the given institutional conditions the supply of money has to adjust to the demand arising from real activities at any date. The central bank is not an institution outside the system which can freely decide whether it accepts Friedmanite recipes or not, but an endogenous element of the system which must meet the demand for money.

We return to the institutional aspects of the problem in Chapter 22.

Macro-interrelationships: The suction model

21.1. Introduction

The present chapter is a *partial summary*. It does not undertake to give a complete survey of all main ideas in the book, but merely to repeat and emphasize some of our earlier propositions. The first part of the chapter uses a simple model to analyze some major macro-interrelationships in a resource-constrained economy, while the second part supplements the lessons derived from the model with one or two general remarks.

First, in sections 21.1–21.6 we explain the model in its simplest form, and begin our explanation by stating our simplifying assumptions. Later, in sections 21.7–21.8 we consider, how far our conclusions would have to be amended if we altered one or other of the assumptions.

(1) Production and consumption are described in an aggregate form.¹

(2) Production is divided into two categories: department I making producer goods and department II making consumer goods.²

(3) All products can be stored; we shall disregard services which are not storable.

(4) There are no primary resources. The output of department I is the only input into departments I and II.

(5) The friction in adjustment is given and it does not depend on the other state variables of the system.

(6) The model is dynamic. We examine a stationary economy, or simple reproduction. Time is a continuous variable. Accordingly the variables describe the instantaneous control and adjustment of the system.

(7) The economy is closed. We do not cover foreign trade.

¹The aggregation may be done using the assumptions made in earlier chapters of the book. (See, for example, assumption (5) of section 12.1 that the commodity composition of aggregate output is constant.)

²This division basically corresponds to the division in Marxian reproduction theory. (See Marx, 1867–1894a,b, vol. II.) The definitions in the present model are somewhat different from the Marxian ones because the subject of the analysis is different and the institutional features of the economic system being modelled are also different.

(8) Of the micro-organizations of a socialist economy we only discuss firms in social ownership and households. We neglect nonprofit institutions, private firms and the informal “second economy” outside the formal sector comprising firms and nonprofit institutions.

(9) The economy functions in the framework of the traditional system of economic management. The firm’s budget constraint is soft, that of the household is hard.

We shall not introduce a mathematical model of the process. Instead, we shall be content with a diagrammatic representation, using *hydraulics* as an analogy. Let the “flow” of products be represented by the flow of some liquid, water for example, and stocks be represented by accumulations of that liquid. The analogy is not new. At the London School of Economics several decades ago the *Phillips machine*³ demonstrated with an actual liquid flow model the interrelations between the Keynesian macroeconomic variables.⁴ We have not constructed a real analog model (though there would be no difficulty in doing so), but we shall represent our interrelations with the aid of diagrams only.⁵

21.2. The second reservoir and the tap

Figure 21.1 shows a reservoir in side view. This is reservoir II. It may be interpreted as the accumulated output of all firms in department II; the output flows here after being produced but before being distributed to households. It is as if – in conformity with our macro-approach – all finished product inventories of firms producing consumer goods and all commodities stored by firms engaged in domestic trade were gathered in a single huge warehouse. Thus, the quantity of the liquid stored in the reservoir symbolizes the stock of output,⁶ the inflow represents production and the outflow purchases by the household sector.

³The machine was constructed as a visual aid for teaching macroeconomics by the same Professor Phillips whose name later became known through the “Phillips curve”, which describes the relationship between unemployment and inflation.

The Phillips machine shows – in our terminology – liquid flowing as a result of *pressure*, while we are discussing flows initiated by *suction*.

⁴Samuelson (1948a,b) also presents a hydraulic analogy for the Keynesian system. The idea that a hydraulic analogy could be used to illustrate markets in a shortage economy was suggested by Jörgen W. Weibull.

⁵Questions which are in some respects similar to our “reservoir problem” are elaborated in detail in mathematical terms in hydraulic engineering. The pioneer of this research was Moran (1959); a survey of the present state of research is given in Anis-Lloyd (1975).

⁶Our model separates – on an abstract level – the input stocks from the output stocks. (We did the same in earlier parts of the book, in the models of Chapter 7 for example.) The liquid accumulating in the reservoir symbolizes stocks of *output*.

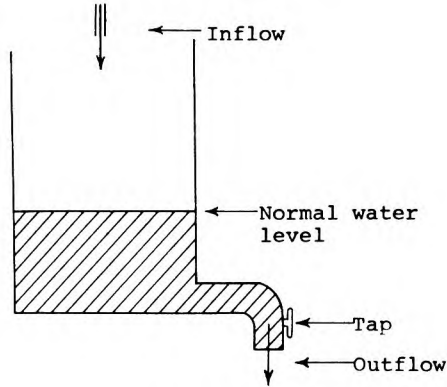


Figure 21.1. Reservoir II.

The inflow, the stock of the liquid and the outflow all represent *real* magnitudes, or quantities.⁷

For the time being we assume that the second reservoir is perfectly insulated from the first reservoir, into which – as we shall see later – output of department I flows.

Let us begin our analysis with the assumption that there is slack in the production and trade of consumer goods which has developed historically and is socially accepted in the system. This is symbolized in the present simple model by the normal stock of the liquid accumulated in reservoir I, that is by the *normal total stock of output*.

Let us assume that at some initial moment the actual stock of output is exactly equal to the normal stock. What conditions must be satisfied for the normal state to persist? In fig. 21.1 a quantity of liquid has accumulated in reservoir II which is the normal level. Under what conditions will the level of the liquid neither rise nor fall?

The first condition is trivial: the stock of output of department II is *constant* if at every moment the same amount of goods flows into the reservoir as flows out of it:

$$\boxed{\begin{array}{l} \text{volume of} \\ \text{consumer} \\ \text{goods pro-} \\ \text{duction} \end{array}} = \boxed{\begin{array}{l} \text{volume of} \\ \text{household} \\ \text{purchases} \end{array}} \text{ at every moment.} \quad (21.1)$$

⁷We may assume, for instance, that the quantity variables are aggregated at the actual prices of some base period.

Condition (21.1) is the condition for the normal state of department II in the *real* sphere.

The question is now this: what condition has to be satisfied in the *control* sphere if the normal state in the real sphere is to be maintained? The answer follows directly from the analysis of sections 19.4–19.6, which we have here only to recall (and reformulate according to the structure of the present model).

To secure a steady state, stock of output which is continuously equal to the norm, the following condition has to be satisfied at every moment:

$$\begin{array}{|l} \hline \text{volume of} \\ \text{consumer} \\ \text{goods} \\ \text{production} \\ \hline \end{array} = \begin{array}{|l} \hline \text{amount of money} \\ \text{which} \\ \text{households intend to} \\ \text{spend on} \\ \text{consumer goods} \\ \hline \end{array} : \begin{array}{|l} \hline \text{consumer} \\ \text{price} \\ \text{index}^8 \\ \hline \end{array} \text{ at every} \quad (21.2) \\ \text{moment.}$$

Condition (21.2) is the *demand* condition for the normal state of department II. In our aggregate model we may assume that the savings of households depend exclusively on nominal income. In that case control of the relationship between nominal income and the consumer price level acts as the *tap* in the reservoir. If the tap is tightened (for example by keeping nominal income unchanged with a rising price level, or by decreasing nominal income with an unchanged price level⁹), and if the rate of inflow remains unchanged, the level of the liquid in the reservoir will start to rise until it spills over the sides. This means that stocks are growing; a sales crisis arises, and there is no more room in the stores for the goods accumulating.

In the opposite case, if the tap at the outlet is opened wider (by keeping nominal income unchanged with a decreasing price level or by increasing nominal income with unchanged prices), and if the rate of inflow remains unchanged, the level of the liquid starts to fall. The stock of output decreases, and finally disappears. Of course, the trivial relationship remains valid, that it is impossible to consume more than has been produced. Thus, if the tap remains wide open permanently, sooner or later a new

⁸With a fixed product composition for the macro-aggregate and at fixed relative prices this is the quotient of the current price level and the price level in the base period.

⁹We mention these two pure cases here only to facilitate the explanation. In reality – as it turns out also from the formula – the relevant issue is the *relationship* between the quantity of money destined for the purchase of consumer goods and the consumer price index.

steady state comes about, which may be summed up as follows:

$$\begin{array}{|c|} \hline \text{volume of} \\ \text{consumer} \\ \text{goods} \\ \text{produced} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{volume of} \\ \text{purchases} \\ \text{by house-} \\ \text{holds} \\ \hline \end{array} \text{ with a zero} \\ \text{stock of output} \\ \text{at every} \\ \text{moment,} \tag{21.3}$$

$$\begin{array}{|c|} \hline \text{volume of} \\ \text{consumer} \\ \text{goods} \\ \text{produced} \\ \hline \end{array} < \begin{array}{|c|} \hline \text{amount of money} \\ \text{intended by} \\ \text{households to} \\ \text{be spent on} \\ \text{consumer goods} \\ \hline \end{array} : \begin{array}{|c|} \hline \text{consumer} \\ \text{price} \\ \text{level} \\ \hline \end{array} \text{ at} \\ \text{every} \\ \text{moment.} \tag{21.4}$$

Condition (21.3) repeats the trivial *real* condition (21.1), adding that the identity of production and purchases is realized with zero output stock. Condition (21.4) replaces the *demand* condition (21.2). The sign of inequality shows that *aggregate excess demand from households* has become the normal state in the consumer goods sector. In Chapter 18 we made it clear that this is an extreme case – though it may indeed occur. But there may be a very intense shortage on the consumer goods market without the extreme state expressed in (21.3) and (21.4) actually occurring. Until that state is realized demand from households is an effective constraint on the sale of consumer goods. Until then the tap regulating the outflow from reservoir II will actually function.

The above observations about department II are an elementary finger-exercise for beginning students of macroeconomics. All interrelations are easily comprehensible and self-evident. The variables on the right-hand side of condition (21.2) are well-known methods of “demand management”. Yet we hope to convince the reader later that it has been useful to revise this material briefly, in order to show up the considerable difference in functioning between department I and department II.

Let us assume that the ratio of productive to unproductive elements in the slack is given on the macro-level. Although some stocks are unsaleable others readily find buyers. We recall a point which we have already made in this book from several aspects: *there is a close negative relationship between the level of productive slack and the intensity of shortage*.¹⁰ If stores are packed with goods (with given uncertainties about buyers’ and sellers’ intention, a given overall lack of information, and given adjustment

¹⁰See mainly the figures in section 8.7. For a more detailed account of the relationship see Chapters 8 and 12 and sections 19.4–19.6.

frictions), then forced substitution will be comparatively rare; households can get the commodities they require after a short search, without waiting or with only a short wait. If, on the other hand, stores are empty (again with given adjustment frictions), forced substitution will be frequent and serious, lengthy searches occur and long waits and queues are inevitable. On the basis of this relationship, we can say that *on our assumptions the time paths of nominal income and of the consumer price level (i.e. the tap in the second reservoir) control the intensity of shortage.*

Just as the *normal slack* in the consumption sector, and on that basis the normal productive output stock, has developed so is the *normal intensity of shortage on the consumption market* determined. If the actual intensity of shortage deviates from the norm, it can be driven back to it. On the assumptions of our model an adequate calibration of nominal income and the consumer price level is sufficient to control the system, *if* (a) the production of consumer goods is given, and (b) the stock of output in department II (and, generally, the slack in department II) are perfectly insulated from other sectors of the economy. We emphasize the word *if* because it is exactly these conditions, (a) and (b), which cause the problems.

21.3. The first reservoir and pumping

In fig. 21.2 we present the reservoir of department I. For the moment we assume again that it is insulated from the reservoir of department II. There is an essential difference between the two reservoirs: *there is no tap at the outlet here.*

There was a tap to reservoir II because the purchasing intentions of buyers – households – were subject to a hard budget constraint. If a household has a lot of money and/or if the prices are lower, it can purchase more; if it has little money and/or if prices are high, it purchases less. On the other hand, the purchasing intentions of the buyer of producers' goods – firms in Departments I and II – are not subject to a hard budget constraint. Their intentions do not depend on how much money they have, since firms' finances more or less passively adjust to their financial needs.¹¹ They do not much depend on the price of inputs, to which firms do not respond.¹² These purchasing intentions depend in practice – with a given production plan and a given technology – on

¹¹See section 20.2.

¹²See Chapters 13 and 14.

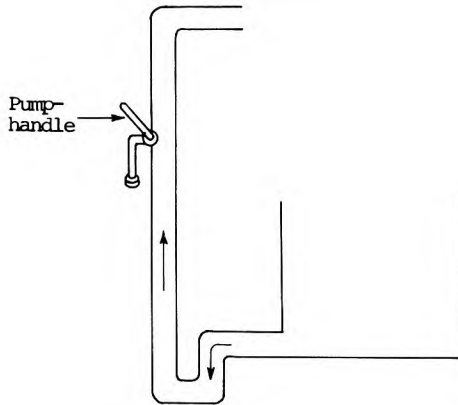


Figure 21.2. Reservoir I.

whether the required inputs are available. Firms' demand is almost-insatiable:¹³ this is symbolized in the figure by an outlet without a tap.

In consequence as a first approach and on present assumptions reservoir I is empty. In the abstract world of our macro-model it is characteristic of the normal state of department I that its stock of output is constantly zero. In this normal state the quantity of inputs which firms procure is equal at any moment to the instantaneous production of producers' goods. This expresses – at a high level of abstraction and on a macro-level – the phenomenon which in Part I we discussed at the sub-micro and micro-level, namely that production continuously comes up against resource constraints.

In reality, of course, there are positive stocks of output in department I too as we shortly make clear. However, there is a *strong tendency* towards recurrent depletion of stocks, the accompanying phenomenon of *highly intense shortage*. Forced substitutions are frequent, often accompanied by serious losses, waits and queues. This makes it almost inevitable that rationing schemes are widely applied in allocation.

The *real* condition under which the normal state is maintained applies here too, of course: outflow must be identical with inflow. But there is no effective *demand* condition because there is no effective budget constraint on the buyer.

What is more, the problem is not simply that the liquid flows out at the bottom of the reservoir. On the figure we can see a pipe pointing upwards

¹³See Chapters 5 and 9.

with a handle which represents the lever of a *pump*. This pump actively sucks out the liquid from reservoir I.

What *driving force* works the pump? In the present chapter we shall describe several different driving forces, but here we shall name only one. One of the main driving forces operating the pump is the *quantity drive*¹⁴ and its inseparable accompaniment: the *hoarding tendency*.¹⁵ With its given fixed capital the firm wants to produce more: this is encouraged by taut plan directives, as well as by the urging of customers. For this it needs more and more inputs. Because of supply uncertainties it tries to build up a reserve of inputs. Therefore, firms as buyers eagerly clear out the sellers' stocks of outputs, either for immediate use or for keeping as their own stocks of inputs.

21.4. Leaks and plugs

So far we have perfectly insulated the two reservoirs from one another. In reality, however, no such perfect insulation occurs. Fig. 21.3 shows the two reservoirs together. On the partition wall there are *leaks* through which the liquid is filtering.

We have treated this phenomenon at several places of the book, mainly in section 19.3. For the time being – staying within the present framework of the model – we content ourselves with the simplest case. On account of their physical properties some goods are suitable only for consumption, or only for use as inputs into production. The use of other commodities, however, is not predetermined by their physical properties. If such a product is available in the store-room in department II, the purchasing agent of a firm can buy it too. For example he can buy up petrol, coal, stationery, electric bulbs, and so on before households can get them.

By the law of communicating vessels the water level of reservoir II should go on falling until it reaches that of reservoir I. In other words: *department I would pump out all the slack from department II*. This tendency operates in fact, but it is impeded by *counteracting tendencies* which are symbolized by *plugs* in our hydraulic analogy. Leaks are reduced or blocked by various plugging mechanisms. Some of these will be discussed later; here we mention only the most obvious one: the central authorities try to prevent such pumping out by *administrative prohibitions*,

¹⁴See section 3.2.

¹⁵See section 5.6.

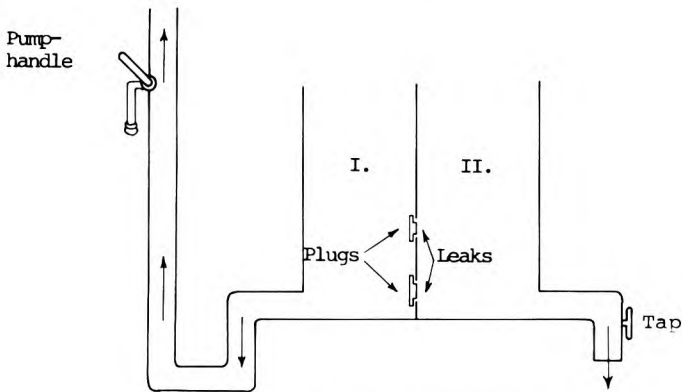


Figure 21.3. Leaks between the two reservoirs.

for example by prohibiting firms and nonprofit institutions from making purchases in shops selling to households.

Water may flow through the leaks in either direction. And this may indeed happen in the economy. For example, owners of private cars buy up spare parts before the firms get them and conversely. But even though leaks in both directions are possible in practice, the flow is usually in one direction: it is mainly firms which siphon off goods for their own use.

21.5. Inflow and the sluice

Figure 21.4 shows what happens to the inputs pumped from reservoir I. They flow through a vertical pipe towards an *allocator*. After allocation, some inputs arriving via the left-hand vertical pipe are used by department I. Our macro-model does not deal with the control of production, which is therefore symbolized by a “black box”. Within the box inputs are transformed into outputs which then flow through the vertical pipe into reservoir I. A similar transformation takes place on the right-hand side, ending in the inflow of consumer goods into reservoir II.

The relative proportions of the two flows are basically determined by the relative ratios of the diameters of the two vertical pipes. Beyond that a “fine” control is achieved by the *sluice* shown by the allocator. This can increase or reduce inputs going into the production of consumer goods, and thus control the supply of liquid in reservoir II. In terms of our hydraulic analogy the sluice represents the macro-planning of consumption

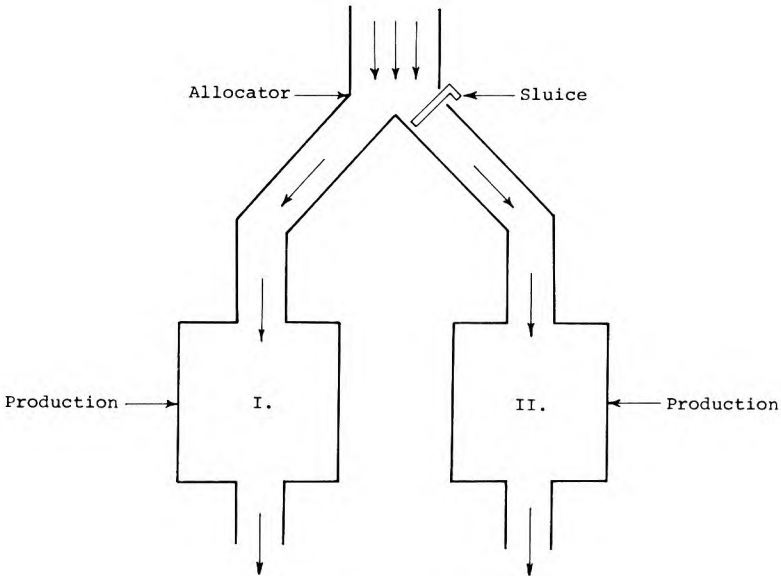


Figure 21.4. Inflow.

described in sections 19.4–19.6. As we explained there, the plan targets for the output of consumer goods are determined on various considerations, while the *norms of slack and shortage are taken as given*. Accordingly, the control of the sluice is linked to the observation of the water level in reservoir II. If the level of liquid rises, that is if the stock of output rises above the normal level for production and sales of consumer goods, the sluice is narrowed, so that the level of stocks sinks back to normal, and conversely in the opposite case. (Similar feedback is found, for example, in the sluice system connecting a river and a lake, which receives its water supply from the river.)

21.6. The model of suction: First approach

Now we have before us – as a first approach and in simple form – the model of the complex social phenomenon called *suction*.¹⁶ Having successively shown the components of the model in figs. 21.1–21.4, in fig. 21.5 we illustrate the system as a whole.

¹⁶This category was introduced in my book *Anti-Equilibrium* (Kornai, 1971a, b). Although the general interpretation of the phenomenon remained the same, our account of it and our

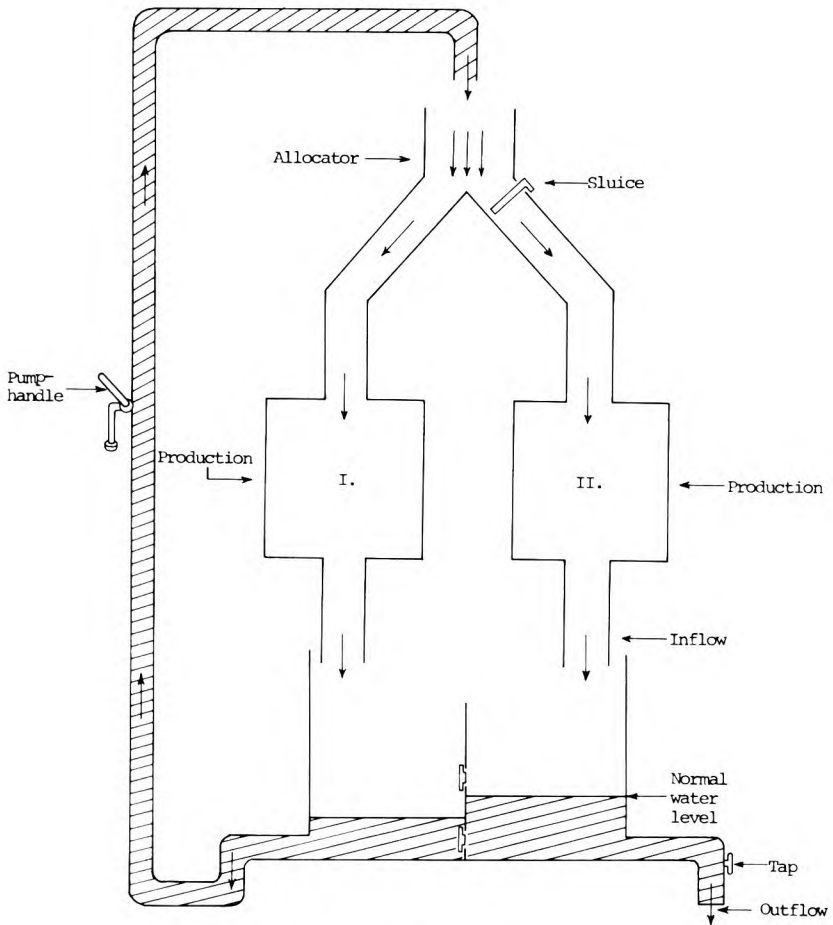


Figure 21.5. The suction model.

Let us first consider the hydraulic analogy. The flow could start by forcing liquid into the network of pipes and reservoirs (pressure). In our case, however, the flow does not originate in this way, but by continuously pumping liquid out of the system (suction). In the scheme we have outlined the *pumping mechanism* has a central role.

explanation of its causes have become more detailed in the present book and have been modified to some extent.

Reverting from our analogy to economic reality in the model, we wish to stress the following major features of suction.

The classical method of controlling effective demand (by determining nominal income and the consumer price level) is incapable in itself of increasing the amount of slack and of decreasing the intensity of shortage in the consumer goods sector. It cannot do so because there are no rules to ensure that the supply of consumer goods always fully satisfies initial consumer demand. On the one hand, consumer goods are released to the home market in a way that maintains the normal level of slack and the normal intensity of shortage. On the other hand, the wholly monetized sector of the economy is not hermetically sealed from the firm sector which is only apparently monetized. The almost-insatiable demand of this sector leads to permanent suction, which causes intense shortages not only in the market for producer goods in the strict sense, but, indirectly, in the consumer goods sector as well, by diverting part of the supply.

We shall now start to consider what happens if we relax the simplifying assumptions enumerated in section 21.1. In our opinion the account will become more concrete and realistic, but the general impression of suction which we have tried to convey to the reader will remain unchanged.

21.7. Disaggregated approach

Concerning assumption (1) that the model deals with macro-aggregates only. Yet the author wishes to warn the reader – as well as himself – not to forget at the end of the book the point which was so much stressed at the beginning. Shortage is a statistical phenomenon composed of millions of micro- or even submicro-level events. At every moment there is a shortage somewhere, either of some input into production or of a consumer good wanted by a household. The existence of these shortages is compatible with an instantaneous slack in other inputs and other consumer goods. What is more, as a consequence of *complementarity*, in both production and consumption, a shortage of some input necessarily leads to an instantaneous slack of other complementary inputs. For this reason alone the level of the liquid cannot fall exactly to zero in either of the reservoirs. Even in a situation of very intense shortage, some slack is continuously maintained.

I should like to underline the following point separately. In our macro-model the quantity of liquid stored in each reservoir, the stock of outputs in departments I and II, is *a real number* which represents *two vectors*: a vector of slack and a vector of shortage. The two real numbers can

demonstrate the direction of changes in the vectors, but neither of them can be interpreted as an *aggregate* formed from the numerous detailed indicators of slack and shortage.

Concerning assumption (2) that there are two departments. In the macro-view of the original model we can see two huge reservoirs. In reality there are thousands and thousands of little reservoirs – as many as there are firms in the system – and there are also “subreservoirs” within each firm for individual products. If we realize this, we shall soon have a better understanding of the phenomena of “leaking” and “siphoning-off”. It is not only that the *final* outputs of department II are bought up by the purchasing agents (firms in both departments I and II) before the household has access to them. It is perhaps even more important that firms making producer goods may divert electric power or raw materials from firms making consumer goods. Let us consider departments I and II as two gigantic vertically integrated combines. This is symbolized by the two black boxes for production in fig. 21.4. The activity of department II is constrained, *in the last resort*, by the effective demand of households. As opposed to this, the activity of department I has no such effective demand constraint. Therefore, it is understandable if combine I can exert in each stage of production a “siphoning-off” effect on the inputs used in the corresponding stage by combine II.

Concerning assumption (3) that only storable products are produced. A disaggregated description of economic reality should include not only storable products but also nonstorable *services*. Since the distinguishing feature of the latter is exactly that they are not storable, the reservoir and the rest of the hydraulic analogy cannot be applied. Yet the *essence* of what we have said so far can be extended to the service sector too.

In services there are no separable inflows and outflows. *Slack* is shown in another form as capacity which is physically available, yet not actually used. If we have grasped this, the general conclusions of our model can be reformulated for the case of services as well. Both departments produce services. Like the demand for goods, the demand for services supplied by department II is limited by the buyer’s effective budget constraint. On the other hand, the demand for services produced by department I is not so limited. “Siphoning-off” takes place here as well. Whenever they can, firms will hire accommodation which is otherwise also suitable for dwellings for office purposes, will use service stations for private cars, and so on.

For the sake of maintaining our diagrammatic representation, we shall continue with the hydraulic analogy in the remaining part of the chapter and include no separate discussion of services.

Concerning assumption (4) that all inputs are reproducible. Of course, there are primary resources in the economy, particularly labor, natural resources, and so on. These are basically not “reproducible” in the course of a standard production process and cannot therefore be illustrated in the framework of our hydraulic analogy. But the interrelationships exemplified by the model apply to them too. They too are sucked in by the social reproduction process until physical resource constraints appear in the form of bottlenecks or until social tolerance limits are met. (We recall Chapter 11 which analyzed labor shortages.)

The “siphoning-off” effect also operates in the use of primary resources. For example the heavy industry and construction draw some workers away from trade or from the health service.

Concerning assumption (5) that there is no friction. Friction in the adjustment processes of the system can only be described by a heavily disaggregated model, on the micro- and submicro-level. In our analogy we described the flow of a perfectly liquid substance. The flows of inputs and outputs taking place in a real economic system, however, are more like the movements of some crushed or semiliquid sticky material. Neither reservoir becomes perfectly empty, as some of the material stored there “gets stuck in it”. Replacement is rarely continuous. Stocks have to be accumulated between delivery dates. Besides this unavoidable factor the signs of friction discussed in detail in Chapter 8 also appear. Let us consider some examples.

Reservoir II would not be perfectly emptied even in the extreme case indicated by formula (21.4), of constant aggregate excess demand. Buyers do not know exactly when and where they can find what they want. And even in this case there are some goods which are of such poor quality or so unwanted that they are almost impossible to pass off on a buyer. And the situation is similar also with the reservoir in department I. However strongly the pump may work, it cannot drain the reservoir entirely. There are materials, semifinished goods, and parts which are of no use either now, or for accumulation as stocks even to the firm which is most willing to make a forced substitution.

Friction also slows down leaks from reservoir II into reservoir I. It may happen that a producer could purchase some of his inputs in the consumer goods sector, but is not sufficiently well informed, or quick and flexible enough to do so.

Because of this in fig. 21.5 even reservoir I is not empty. True, the level of liquid is somewhat lower than in reservoir II. We do not intend to indicate by this that the normal level of slack is necessarily higher in

reservoir II and the normal intensity of shortage is lower. We only wish to make it apparent that complete equalization *need not* occur.

21.8. The motive forces of pumping

Concerning assumption (6) of a stationary economy. Socialist economies are not stagnating but grow continuously. Expanded reproduction cannot be represented by a snapshot of pipes and reservoirs, but should be shown by a *moving* picture, with pipes increasing in diameter, and reservoirs of increasing cubic capacity.

In an earlier part of the book¹⁷ we explained that in a socialist economy an *expansion drive* is present in the behavior of every decision-maker and it leads to the concomitant phenomenon of an insatiable and continuous *hunger for investment*. This is the *most important* driving force in the pumping process. If some resource suitable for investment purposes has accumulated somewhere, and some slack has occurred, investment demand will siphon it off immediately. Investment demand is almost-insatiable, because the budget constraint on investment is soft.

Expansion drive, and the hunger for investment appear at every level of the hierarchical, multilevel control system.¹⁸ In certain periods of economic history this shows up most clearly in the behavior of the economic leadership: central economic policy forces the fastest possible rate of growth. At such times the largest and most powerful pump is in central hands. Yet even if central economic management were more moderate, the controllers of each sector, the boards of directors of each firm, and even the foremen of each workshop want to expand and require investment resources. Each of these has a pump and tries to siphon off the largest possible amount of investment resources for their own unit from the large communal reservoir.

Concerning assumption (7) of a closed economy. If we wished to incorporate *foreign trade* into our analysis also, then even if remaining at the macro-level we would have to add at least one more reservoir to the model.¹⁹ This is represented in fig. 21.6. The pipe starting on the left, in

¹⁷See section 9.2.

¹⁸See Chapter 9, particularly section 9.9, on the sufficient reasons for the persistence of investment tension.

¹⁹This is still based on a highly simplifying assumption since convertible and nonconvertible currencies cannot in fact be aggregated.

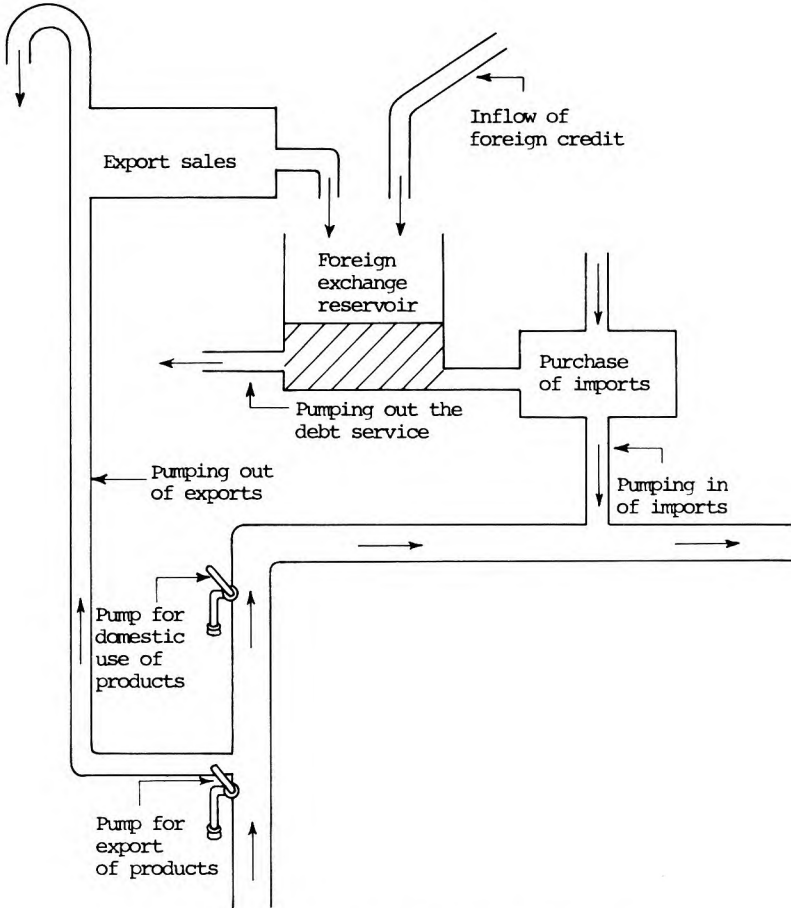


Figure 21.6. Reservoir III: the foreign exchange stock.

which liquid flows upwards, is the same as the pipe from reservoir I in earlier figures. The higher of the two pumps is the one also shown in earlier figures.

The new, third reservoir is in the middle at the top. The foreign exchange that the economy earns through exports and foreign credits flow into it. With a little imagination let us assume that every potential creditor willing to grant credit puts his money in this reservoir in advance. The system continuously *sucks out* the contents of the reservoir, almost to the

last drop. The demand for imported inputs for current production and for imported machinery and equipment for investment purposes is almost-insatiable. Therefore, suction of imports – or of the foreign exchange to pay for them – operates continuously and very strongly. It is constrained only by the ability of exports to earn foreign exchange and political and economic tolerance limits to indebtedness (and perhaps the willingness of the foreign party to supply credit as well).

The third reservoir would be permanently empty, its contents continuously siphoned off by the almost-insatiable demand for imports and the obligation to repay debts. Therefore, it has to be replenished permanently. And here we come back to the basic suction model. One of the main motive forces in the pumping system is the extremely strong *export drive* which may go to the stage of forced exporting. As a matter of fact, almost anything can be sold. Some export markets are themselves shortage economies, where demand is almost-insatiable.²⁰ But a foreign market with a hard demand constraint can also be penetrated if the exporting country supplies its most attractive products, or maybe less attractive ones, but at low prices. And since firms producing for exports as well as foreign trade organizations within the country have soft budget constraints, the possible losses of an actual export transaction can be made up without difficulty. Exports have no voluntary constraint in the sense of firms declining to export, because to do so involves losses if calculated in domestic currency. Therefore, *the foreign trade sector in control of exports has an almost-insatiable demand for output*. It takes for export as many products as it can siphon off before they go for home consumption.

As for its motivation, the export drive is not the primary driving force behind suction. It is a *secondary* driving force, generated by the *primary* driving forces which are the drives for quantity and for expansion. Ultimately, these two drives create an almost-insatiable demand for imports.

The inclusion of foreign trade into the analysis also helps us to understand the “siphoning-off” mechanism.

It is in fact only of secondary importance that firms’ purchasing agents buy up the goods, literally from under the nose of the private consumer. It is a much more important phenomenon that many of the goods wanted by

²⁰“Chronic excess demand...does not exist in Hungary alone, but in the whole of the CMEA market. Socialist countries have been – up to the most recent times – almost unlimited sellers’ markets for a number of products. Export possibilities in excess of potential supply affect the terms of competition in the same way that domestic excess demand does. Where everything can be sold abroad, if not at home, real competition can hardly emerge: the sellers’ advantage is inseparable” (Falus-Szikra, 1975, p. 219).

households do not even reach the shop's stockroom because they have been siphoned off for foreign trade.

Concerning assumption (8) that there are only firms and households. Let us consider what happens if other agents besides firms and households are considered.

We have explained that nonprofit institutions²¹ are not in the same position as regards their budget constraints. If the budget of a nonprofit institution has been decided, it usually acts as a hard constraint. But all nonprofit institutions try *ex ante* to get as many current inputs as possible and, particularly, as much investment as possible. In nonprofit institutions, as well, the "quantity drive" (for more patients to treat, for more students to educate), operates, as well as the "expansion drive". The nonprofit institutions are there too among the "pumpers". Their energies are multiplied by the knowledge that the households are impatient for their services, which are allocated free or at nominal price, through administrative rationing or queuing. The siphoning effect of free or almost free services, and of allocations in kind is transmitted mainly through suction by the nonprofit sector.

Since we have given a more complete account of the pumps siphoning off the liquid from the left-hand reservoir than we did in our first approach, we should also say something about the right-hand reservoir. If the extreme state described in formulae (21.3) and (21.4) occurs, that is if money which can not be spent at all starts accumulating in the households, the tap on the outflow on the right-hand side becomes incapable of functioning too. Then even demand from households ceases to be an effective constraint on sales. This is the situation when households too control the handle of a pump; their demand too becomes almost-insatiable.

At this point it will be appropriate to make a more general remark. In speaking of the two reservoirs which are side by side, what has to be stressed is not that the one on the left contains producer goods and the one on the right consumer goods. The more important distinction is that the buyers of products flowing from the reservoir on the left-hand side have a soft budget constraint, while buyers of products from the reservoir on the right have a hard one. Which groups of buyers belong to which type²² depends on the actual features of the system.

²¹See section 14.11.

²²For example, there are in several Eastern European socialist countries privately owned small enterprises which work with a few employees. Although these are "firms", they certainly have a *hard* budget constraint.

It would go beyond the framework of this book to show where and how the "second economy" fits into the macro-model of suction.

In first describing our macro-model, we mentioned only a single pump; in this section we have presented *a whole system of pumps*. Indeed, in the economy *many forces keep the suction process going*. In several places in the book we have separately presented some partial self-generating processes or vicious circles in the shortage economy. Now we synthesize the results as follows. *The model shows the basic self-generating mechanism behind shortage. Shortage breeds shortage. The more intense the shortage, and the more the economy feels the driving forces behind the siphoning – the drive for expansion and the associated hunger for investment, the quantity drive and the associated hoarding tendency, the export drive, and the almost-insatiable demand for free allocations the greater the power applied to every pump. And the stronger the pumping, the more intense the shortage becomes.*

In any historical period relative proportions of the various pumps form an important characteristic of a particular suction economy. However, it seems that the *investment pump is the most important* in all circumstances. Of course, it is always associated with the others. Nevertheless, if – for the purposes of mental experiment – it operated alone for a long time, *the almost-insatiable demand for investment would be sufficient in itself to make the system a resource-constrained suction economy.*²³

Concerning assumption (9) that we describe the traditional system of economic management. Our figures show one or two large pumps. In reality, every firm and nonprofit institution in the economy, and every organization of the multilevel control system has its own pump, large or small, weak or strong.

The relative sizes of the “large” and the “small” pumps and the relationships between the decision-makers operating the pumps have been significantly modified with the reform of economic management. The firm no longer needs an instruction or permit from above for it to use its pump. It is entitled and able to do so at its own discretion. But since its budget constraint has remained rather soft, it is not obliged by economic factors to restrain its almost-insatiable demand. Thus even now there is no tap on the outflow of the reservoir of department I.

At several places of the book we have pointed out that in the wake of the Hungarian reform of the economic management system and as a result of changes in economic policy, the shortage has reduced in intensity in Hungary in the last ten or fifteen years. However important this change may be, the *main* characteristic of the mechanism illustrated with the hydraulic analogy continues to apply: the flow is maintained by *suction*.

²³To this extent it is a counterpart of the Keynesian state of unemployment. The latter is also caused by several factors in combination, but it can be seen logically that inadequate investment demand is in itself sufficient to bring the state about.

If we recall our picture of a whole system of pumps, with various decision-makers each having a larger or smaller pump in his hands, we shall understand that the phenomenon of suction will not disappear by admonishing directors to modesty and self-restraint. Let us assume that one of them decides to be more moderate from now on. He will not try to accumulate as much input as he can, he will not try to extract as many investment resources as possible; even if he does not stop, he will at least reduce his siphoning off. The result will be that the unit under his control gets less. Other firms, nonprofit institutions, and supervisory authorities carry on pumping and pumping, and they pump out also what the self-restrained manager has renounced. If he sees this happening he will start again and go on pumping with even greater intensity than before.

21.9. The allocation of shortage

Before proceeding any further in our reasoning, we repeat and summarize what we mean by “shortage”. We have become acquainted with four major forms of it in this book.

(1) A resource, good, or service is allocated by administrative rationing. The sum of claims exceeds the quantity available to the allocator. This is a “vertical shortage” appearing in the vertical relationship between the allocator and the claimant.

(2) A resource, good or service is sold by the supplier to the customer for money. The seller’s supply does not cover the initial demand of his customers. This is the “horizontal shortage” appearing in the horizontal relationship between seller and buyer – the “sellers’ market”.

(3) A producer firm or a nonprofit institution supplying a service free of charge does not have the inputs necessary to fulfill its plan. This is a shortage within a micro-organization: resource constraints are met.

(4) Social capacity is utilized highly in production, or more generally by social activity. A shortage of capacity emerges. Continuing and expanding the activity involves sharply rising marginal social costs.

These four phenomena are *direct* manifestations of shortage, and are accompanied by many kinds of indirect effects. They frequently overlap and intertwine. All phenomena listed are included in the *collective concept* of “shortage”.

The suction mechanism illustrated in our hydraulic analogy in this chapter causes general and chronic shortage. Of course, we must interpret the

adjectives "general" and "chronic" correctly. There is not a shortage of everything, everywhere, and at every moment. We have stressed several times that at the submicro-level shortage is compatible with, and even accompanied by, a momentary slack of certain resources and certain products. And yet we are justified in talking about *general* and *chronic* shortage, for two reasons.

First, because there are frequent and fairly intense shortages of many resources and products in many places. No sector is free from these phenomena.

Secondly, because whenever and wherever shortage phenomena appear, *they can always and everywhere be traced back to a common original cause. We are dealing with different specific manifestations of the same general phenomenon. Shortage ceases here today, but appears somewhere else tomorrow, perhaps even more intensely.*

One of the basic traditional topics of economics is the allocation of available resources and goods. To this we can add, as a new subject, the allocation of the *nonavailability* of resources and products, in other words the *allocation of shortage*. Allocation of shortage implies a distribution *to someone* (a user), *of something* (a resource or product) at a particular level of *intensity* of shortage.

Let us consider the problem not at the submicro-level, but in a more aggregate form. Let us start by examining *what* the shortage is of. The allocation of shortages between major groups of resources and products changes over time partly as a consequence of changes in the *real* conditions of the economy, external and internal. Of course, the joint impact of many small changes also plays a role. However, let us now point out the effect of the *great secular changes*.

In its early stages the socialist system inherited from the preceding system a situation in which utilization of a number of resources was low. The most important example is labor. We pointed out in Chapter 11 that in the extensive period of economic growth there was a potential reserve of labor which was easy to mobilize. However, this reserve is absorbed by the growth of socialist economy over a shorter or longer period, and is followed by an intensive period which is characterized by chronic labor shortage.

A similar process takes place with the use of land which was previously uncultivated, or, to introduce an example from the consumer goods sector, with the absorption of the slack in residential housing.

These are *unidirectional, irreversible, and asymmetrical processes*. They are irreversible because the absorption of the slack and the creation of

chronic shortage are not followed by the reappearance of the reserve which has been absorbed, or a radical elimination of shortage. They are asymmetrical because the development of a shortage of one resource or product group is not accompanied by the generation of slack in another resource or another product group. Labor is the best example of this too. When Hungary was still in the period of extensive growth there was a severe scarcity of investment resources. Firms, nonprofit institutions and their superior authorities competed for investment – but there was no particular need to compete for labor as well. The idea has arisen that, since labor is now becoming the most serious bottleneck, a slack of capital will appear sooner or later. However, this has not happened. At the submicro-level, if we observe the elementary events of production, it may happen that “labor” is available superfluously, *because* “capital” is instantaneously a bottleneck, or, conversely, some “capital” may be superfluous, *because* it is “labor” that is the bottleneck. (The worker may be idle because his machine has broken down. Or the machine may be at a standstill because the worker has not come to work.) At the submicro-level, and instantaneously, a strict and rigid complementarity operates, and this leads to the causal relationship whereby shortage in one factor of production leads to slack in the other one.²⁴ In long-term secular growth processes, however, other interrelations operate.²⁵ *While labor shortage gets established and becomes ever more intense, the hunger for investment does not abate, nor does the investment tension which follows in its wake.* What is more, a new argument has been added to the armoury of arguments for investment: it is needed to release labor. And yet it is possible only locally and for a short time to release labor through investment or, conversely, to save investment through additional labor. A number of vacancies await the released worker (maybe at the same firm where the investment took place). And, similarly, any investment saved is wanted by several impatient claimants. Growth in a resource-constrained economy that has entered the intensive phase is accompanied by chronic shortage of both labor *and* capital.²⁶

It is not only secular changes in *objective* possibilities of the kind illustrated above that can modify how shortages are distributed. *Economic policy can actively interfere with this distribution and can deliberately reallo-*

²⁴See Chapter 2.

²⁵See sections 3.3 and 14.9

²⁶Marx pointed out that there can be *simultaneously* “excess capital and excess population” (Marx, 1867–1894b, vol. 3, p. 250). A symmetrical phenomenon is the chronic capital shortage accompanied by shortage of labor in the socialist economies is a symmetrical phenomenon.

In the recent Hungarian literature Hoch (1978) discusses the simultaneous occurrence of labor and capital shortage.

cate shortage. While in our illustration secular change affects *what* there is a shortage of, we shall demonstrate the role of economic policy by an example in which the identity of the sufferer from shortage changes. Thus, we shall discuss reallocation of shortage among *different users*.

The Hungarian economic leadership has made serious efforts in past years to reduce the intensity of shortage in the consumption sector. Comparing the situation of the 1950s with that of the 1970s it can be stated that the effort has been successful: in the market for many consumer goods shortage has lessened in intensity. The analysis of sections 19.4–19.6, and fig. 21.5 show how such a change can be achieved. (i) An appropriate relationship must be established between nominal income and the consumer price level; (ii) the leaks of inputs and of final goods and services from the consumer goods sector to other sectors must be prevented or at least reduced; and finally (iii) an adequate increase in the supply of goods for consumption must be guaranteed. The quantities flowing down the pipe with two outlets – in figs. 21.4 and 21.5 – to the right-hand reservoir and to the left-hand one are the most important factors concerning the current state of the consumer goods market.

The most flexible – and in the short run the easiest – method of reallocating shortage is to transform a shortage in the home market into a deficit in the balance of payments. Shortage felt by the consumer at home can be reduced, *ceteris paribus*, by diverting fewer products for export, or by importing more goods. The hydraulic analogy of figs. 21.5 and 21.6 may *facilitate* our understanding of the interrelationship. We have here *communicating vessels*: the level of liquid in reservoir II can be raised at the expense of lowering the level in reservoir III.²⁷

Of course, this is not the only possible reallocation. Shortage in the consumer market can be reduced in intensity – again *ceteris paribus* – if tension in the investment goods market is allowed to grow.

We must see clearly the possibilities, and importance of, such a reallocation and the constraints on it. The most important constraint is that as long as the institutional relations and behavioral patterns subsist, shortage will persist. Yet even in a general and chronic shortage situation it does matter what the shortage is of and how intense it is. Central economic policy has the ability to protect to some extent certain sectors from shortages and to shift the worst of them onto other sectors. And it also has the ability to increase or reduce the overall intensity of suction derived from its own activities (e.g. by increasing or decreasing central investments or by planning a faster or slower growth rate).

²⁷This problem was mentioned in section 10.7.

I feel that I have to make a personal remark at this point. Ever since I have been doing economic research, the interdependence of the following three groups of phenomena has always interested me: (a) chronic shortage; (b) economic policy improving a fast rate of growth by every means; and (c) certain institutional relations: a high degree of centralization, multilevel control, administrative rationing, and the subordinate role of money and prices. How do these interact? Which is the cause and which the effect? Or, to put it less sharply: which elements in the system have a primary role and which only a secondary role?

In two of my earlier works, *Anti-Equilibrium* and *Rush versus Harmonic Growth*, I regarded phenomena (a) and (b) as primary.²⁸ Many were opposed to this view, emphasizing that it is the group of phenomena in (c) that plays a primary causal role.²⁹

It appears from my present book that I am now inclined to accept this view. The main explanation of chronic shortage lies in the institutional conditions, and the behavioral rules they lead to. In comparison with this the growth policy of the economic leadership is a secondary explanatory factor, its role is that of strengthening or weakening the effect of the primary factors.

21.10. Suction and inflation

After reviewing the main macro-interdependencies in the suction mechanism and dealing with the question of how shortage is reallocated, we must say a few words about the financial aspect of the problem. We bring together here what we have to say in connection with *inflation*.³⁰ Let us start with an historical observation.

Chronic shortage is compatible with a stable or almost stable price level, but it is also compatible with inflation and a rising price level.

One of the phenomena accompanying shortage (and also perhaps a stimulating factor) may be *repressed inflation*,³¹ or, more exactly, the existence of repressed inflation in certain sectors of the economy. Shortage may be associated with repressed inflation but *need* not be so.

²⁸See Kornai (1971a, b, 1972a, b).

²⁹See, for example, Bauer (1973) which is a review of *Anti-Equilibrium*.

³⁰We here repeat or summarize some of the ideas explained above in Chapters 15, 16, 19 and 20.

³¹An excellent summary of theoretical analysis of repressed inflation is to be found in Hansen (1951).

Historical observation supports the view that a “chronic shortage economy”, and “repressed inflation” are *not* synonymous. They are two different, clearly discernible and complex groups of phenomena which *may* – under certain historical conditions – *partially* overlap. We emphasize this because several authors merge the two concepts in their works. This confusion appears in the economic literature of socialist countries and it also receives great emphasis in the works of a number of Western authors, including those of the Clower–Barro–Grossman school.³² We try to set forth our arguments against the latter school.

Let the capitalist economic system serve as a point of departure. In particular, we will have in mind the state usually called “Keynesian unemployment”. Utilization of resources is low: there is general unemployment and excess capacity. The main cause is insufficiency of aggregate effective demand. If that could be augmented – while maintaining the given price level – production would increase and so would employment and the utilization of resources.³³ On the macro-level a quantity adjustment takes place in the economy at given prices: the increased demand is answered by an increased supply. This reaction is strengthened, in the dynamics of the process, by accelerator and multiplier effects.

As in a mental experiment let us begin administering, in increasing doses, the injections suggested by Keynes. State investment projects are started in an increasing number and the government also gives financial support to private sector investment. Current government expenditure on inputs for nonprofit institutions goes up. Household disposable income rises through tax cuts, for example. This leads almost inevitably to a budget deficit and the deficit will permanently increase. All this is accompanied by increases in the supply of money which grows faster than output. At the same time, however, prices are fixed at their original level by administrative intervention.

The final result of the process is repressed inflation. The increase in aggregate demand absorbs unemployment, galvanizes and progressively overheats the economy. Unspendable money starts to accumulate in the hands of money owners. Excess demand and shortage appear.³⁴

³²See, for example, Barro–Grossman (1974, 1976).

³³Much empirical material and valuable analysis of this issue is to be found in the book by Lundberg (1968), for example.

³⁴This can hold for a longer period only in a theoretical macroeconomic model. In an actual modern capitalist economy a state of “overheating” cannot be maintained for a long time with a relatively stable price level. Under such circumstances inflation cannot be suppressed for long; sooner or later it gets free.

This “overemployment”, which has been briefly described above, is justly considered by Barro, Grossman, and their followers as the *symmetrical counterpart* of Keynesian “unemployment”. Justly, because in *the same system with the same institutional conditions and the same behavioral regularities* a single main parameter (aggregate demand) varies over a wide range from extremely low values to extremely high ones.

Their train of thought goes off the rails when they regard this capitalist system of fixed prices, with excessive Keynesian injections as being identical with a socialist economy for the latter has different *institutional conditions and its behavioral regularities are therefore different, too*.

Since we have explained the numerous specific features of this system over several hundreds of pages, it will be sufficient here only to refer by headings to the differences that exist between Barro–Grossman’s suppressed inflation and the suction system growing up under socialist conditions.

(i) The former remains a *monetized* system even in its overheated state, while the latter is only a *semimonetized* economy. Its household sector is monetized, but the firm sector is only apparently so.

(ii) In the capitalist system the firm has a hard budget constraint. It is true that under conditions of suppressed inflation the money-holder sometimes cannot spend his money. Yet if he were to spend it, he would immediately come up against his own budget constraint. It is *knowledge* of this that has formed his behavioral regularities, which he does not abandon even when suddenly money becomes plentiful. In a socialist economy in contrast the firm’s budget constraint is soft, and *this knowledge* leaves its mark on the behavior of the firm.

It follows from this that in the former system Walras’s law prevails. In the latter system, however, *Walras’s law is not effective*, at least within the firm sector.

(iii) As a further consequence, in the former system it does matter to the firm what prices are – even if those prices are fixed. In the latter system, however, whether prices are fixed or variable, the firm is much less responsive to them.

(iv) Under Barro–Grossman’s suppressed inflation, unspendable money accumulates in the hands of money-holders because they are not accustomed to shortage. Their demand functions have not been adjusted to shortage. (By the way, the authors leave it open, whether this is a transitory disequilibrium, or a new permanent normal state.) We are dealing, however, with a system where a fairly intense shortage has become the normal state, and where buyers’ behavior has adjusted to it. Either buyers already

take expected supply into account when they formulate their initial demand or, if not, they adjust to the situation by forced substitution and forced spending.

This list, although not complete, is long enough to demonstrate that we are discussing a system *of a different nature*, which cannot be described and analyzed simply by reversing the case of Keynesian unemployment.

This argument suggests the same conclusion as the whole of the book, namely that the explanation of chronic shortage, of suction, and of the functioning of a resource-constrained system is to be found not *in the financial sphere, or in special features of price information*, but at a deeper level, in institutional relationships and in behavioral regularities which these institutional relations foster in decision-makers. Although we have already made some remarks about these, we shall add a few more thoughts on the subject in the final chapter.

Degrees of paternalism

22.1. Introduction

As was emphasized in Chapter 1, the book does not embark on a detailed analysis of the social relations and political and power structures of the socialist economies. Only a few of these aspects have been touched upon in the preceding chapters, those closely related to the economic content of the book. Having now reached the end of the book, we only discuss a single aspect of the institutional framework – the relation between the state and the firm, and even here we do not claim to make a comprehensive survey. The choice of subject for the last chapter is justified by the fact that it helps us to understand the main problem investigated in the book, namely shortage.

We begin our argument with an analogy: we shall examine the *economic relationship between parent and child*. Five different “pure” cases will be distinguished.

*Degree 4:*¹ *Grants in kind – passive acceptance.* The new-born baby and the infant of a few months cannot express his needs in words. The parents give him food and clothing “in kind” and care for all his material needs.

Degree 3: Grants in kind – wishes actively expressed. The child still lives with the family which supplies him with everything “in kind”. But he can now talk and express his own wishes. He receives a lot of things without making a request; sometimes he asks for something, sometimes he makes demands. It depends on the parents’ nature whether they assert their will, or make a compromise with the child and grant him his wish. Genuine “bargaining” takes place between parents and child.

Degree 2: Financial allowance. The child has grown up and moved from home, but does not yet earn his living. For example, he becomes a university student in another city than where his parents live. His living

¹For the sake of the later reasoning it is advantageous to give the serial numbers in decreasing order.

expenses are still paid by the parents, but now in the form of a certain sum of money on which he has to live. If he wants to spend more, he has to ask for more. Requests, demands, resistance, compromise, and bargaining have not ceased, but only shifted to another plane: the subject of argument has become the size of the allowance.

Degree 1: Self-supporting – assisted. The child has grown up and earns his living. Basically he supports himself from his earning. If he earns more money, he has more to spend. But his parents are still alive and are prepared to give him financial support if he gets into trouble and asks for help.

Degree 0: Self-supporting – left to himself. The one-time child has grown up, earns his living, and his parents are no longer alive. His financial position depends entirely on what he earns. If he gets into trouble, there is nobody to help him out financially. He must rely solely on himself.

The foregoing five types will be called below the *degrees of paternalism*. In reality, further types may occur, and the combination of pure types is also quite frequent. These five degrees will be sufficient to illustrate our train of thought.

22.2. The position of the firm in the socialist economy

Let us now leave analogy and turn our attention to the analysis of economic life. In our formula let us substitute the state for parents, and the micro-organization for the child—a firm, nonprofit institution or household.² *The degree of paternalism in the relation between state and micro-organization³ is an important characteristic of the nature of a system.*

The economic interpretation of the degrees of paternalism will be demonstrated with a concrete example, that of the firm in the socialist economy.⁴ Our main assertions are summarized in table 22.1. The rows illustrate the five degrees of paternalism. There are two pairs of columns.

²Like any other simile, this one should not be interpreted literally. Obviously, parents give their children the material goods which they have earned themselves, while the state carries out a redistribution. But we are not discussing here the origin of social wealth or the general theory of the state but the limited topic of some features of the relationship between the state and the micro-organizations. Our understanding of these features may be helped by the analogy of the relationship between parent and child.

³The word “paternalism” appears in several works. See, for example, Graaf (1957) and Papandreou (1972). We use the term in a special sense which is somewhat different from that of the works mentioned.

⁴For reasons of space, we shall not consider how the various degrees of paternalism appear in relationships between the state and nonprofit institutions or households.

Table 22.1
The relationship between state and firm in a socialist economy.

Degree of paternalism	Input supply to current production		Allocation of investments	
	Prior to reform	After the reform	Prior to reform	After the reform
4. Grants in kind – passive acceptance	+		+	
3. Grants in kind – wishes actively expressed	⊕		⊕	
2. Financial allowance				⊕
1. Self-supporting – assisted		⊕		⊕
0. Self-supporting – left to itself				

One shows how the firm gets inputs wanted for current production, and the other one shows how it gets investment goods. Within each pair the left-hand column represents the situation under the traditional system of economic management prior to the reform, and the column on the right represents the post-reform state. By filling in the latter columns we see the conditions that have developed since the 1968 Hungarian reform. In the table, the sign + indicates that the degree of paternalism in question applies for allocating the input in question, and the sign ⊕ indicates that this is the predominant or typical degree. Let us now examine the table row by row.

Degree 4: Grants in kind – passive acceptance and Degree 3: Grants in kind – with wishes actively expressed. In both degrees the central authorities allocate inputs among firms in kind and by a rationing scheme without any substantial intermediary role for money. Degree 4 is the most extreme case: this represents central dictation, with no questioning of the users or serious consideration of their opinions. In the period of operation of the traditional system of management this degree appeared with varying frequency, in every historical period, and in each country and sector. The degree most typical of the traditional period, however, is Degree 3, for the allocation of both current inputs and of investment goods. The central authority makes the decision, but in doing so it takes into consideration the wishes of the firm concerned. If the firm is dissatisfied with the allocation, it will ask for more, perhaps presenting an arbitrary demand or “lobbying” in order to have its wish fulfilled. The phenomenon of “plan

bargaining” is well known in this form of economic management.⁵ The central authority wishes more output from the firm for fewer inputs, while the firm asks for more input and promises less output. This is the issue over which bargaining takes place.

*Degree 2: Financial allowance.*⁶ This comes to play an important role in the firm sector only after the reform, and in the allocation of investment. Such a relation develops between state and firm in the case when the investment project takes place within the firm and may even be initiated by the firm, but it is financed exclusively from the state’s central resources. The investing firm wants more money while the decision-making authorities either refuse the firm’s request or accede to it.⁷

Degree 1: Self-supporting – assisted. This is the most widespread form in the postreform situation.⁸ Current inputs are allocated entirely or almost entirely on this basis. In accordance with the generally declared principle the firm is a unit with “independent accounting”. It is obliged to cover its expenses from the revenue from its own output. It lives on its own earnings. Yet if financial difficulties arise, the state will help it out of the trouble by one of many kinds of financial support. We discussed this phenomenon in detail when analyzing the hardness or softness of the budget constraint.

The situation is similar with investments financed from the firm’s own financial resources.⁹ The firm is able to cover the costs by its own earnings. Yet if financial difficulties arise (for example if planned costs are exceeded, the state will help the firm out. It will ensure that the investment project is not prevented by difficulties in financing.

In Hungarian economic life the practice has grown up that if financial difficulties arise at certain places in the economy – in certain sectors, in the manufacturing of certain products, or in foreign trade – the state will come to the rescue by taking over the burden in the state budget. This is a manifestation of Degree 1 paternalism.

⁵See section 3.2.

⁶This is the degree prevailing in the relationship between the central authorities and nonprofit institutions.

⁷On this matter and on the forms of Degree 1 paternalism prevailing in the investment sphere see Chapter 9 and section 20.3.

⁸See Chapter 13, and also Bauer (1975a, 1978) and Falus-Szikra (1975).

⁹An important role is played by investment credits as well as by finance from the state budget and from the firm’s own resources. Combined forms also exist (see section 20.3). The various concrete forms of finance could be placed within a more disaggregated scheme broken down into more degrees of paternalism. Yet we content ourselves here with presenting the main outline.

Degree 0: Self-supporting – left to itself. This row is empty in the table. Neither before the reform, nor since its introduction has a situation occurred in which the firm has been left to itself in the real sense of the word, in circumstances where it might fail to overcome its difficulties.

22.3. Tendencies and countertendencies

The relation between the state and the micro-organization – that is, the currently prevailing degree of paternalism – is an important element in social relations. Therefore, table 22.1 has important lessons for the study of social structures.

Degree 0 of paternalism is the ideal of the Friedman–Hayek school. To tell the truth, this Degree 0 has never appeared with full consistency even with a capitalist system based on private property and independent micro-organizations. Mid-nineteenth-century England may have been close to it, but contemporary capitalism has departed from it. The state intervenes into the economy in various forms. For example, in many cases it helps out in a paternalistic way firms which have incurred losses and are threatened with bankruptcy: by giving state guarantees, credits at favorable terms, tax allowances, and perhaps direct financial support as well. In periods of growing unemployment, trade unions also put pressure on governments to support firms in difficulties in the interests of maintaining employment. Friedmanites blame Keynesians for this increased power of the state which dampens competition and the “natural selection” that follows in its wake.¹⁰ Keynesian ideas have obviously influenced economic policy-makers. It would be a mistake to believe, however, that a scientific trend of ideas could exert such a strong influence, unless the process of social development has prepared the ground and rendered politicians susceptible to Keynesian advice. Atomistic competition with the micro-organization left entirely on its own has become impossible in our age, in which production has been enormously concentrated and state bureaucracy has increased and is becoming ever more powerful.¹¹ It would be absurd to expect that a government which relies on the support of the voters should tell the public

¹⁰See, for example, Hayek’s work in Friedman, Hayek et al. (1974).

¹¹This is suggestively described in the article by Kaldor (1972) entitled “The irrelevance of equilibrium economics”. He lays particular stress on the role of increasing returns in destroying the totally decentralized system, and on the growing activity of the state in securing growth.

that unemployment, the price level, economic growth, and so on, are all the internal affair of the economy and that it, the Government, takes no responsibility for them. The Government *has to* assume responsibility for the economic situation—and its choice is only between different sets of targets and instruments for economic policy. It is therefore *inevitable that sooner or later more or less paternalistic relations develop between the firm and the state.*¹²

And, if that is the situation in modern capitalism, it must *a fortiori* be the same in the socialist system. The social ownership of the means of production is accompanied by an active role for state power in the economy. This activity may be limited or extensive, but it is always present. The central authorities take responsibility for the economic situation and, at the same time, they want to use every instrument in the armoury which they deem useful.¹³ A large and influential apparatus of multi-level control develops in the socialist economy which grows and becomes stronger according to its own laws. Its members identify themselves with their jobs and that gives them the drive actively to shape the course of economic life. All this explains why paternalistic tendencies appear “from above”. These tendencies are complemented with demands for paternalism “from below”.

Lower-level economic managers—the board of directors of firms, and their direct superiors—have ambivalent feelings towards paternalism: they both want it and protest against it. Let us first explain why they want it. *Paternalism means absolute protection and safety.* If a disaster strikes the firm, the state mitigates its effects or may even fully compensate for the loss. This is an extremely reassuring feeling. It does not only guarantee the mere survival of the firm but also ensures that it can even grow without its own financial resources, assuming that it has succeeded in acquiring the financial support of the state.

Let us turn to the opposite tendency. Several factors move the system away from the extreme degrees of paternalism. Here we stress only three of them.

One is the *demand of lower-level managers for independence.* We have just emphasized that their feelings are contradictory. While they gladly accept the safety provided by a paternalistic system the other half of their soul grumbles that higher authorities are continually interfering with their

¹²This phenomenon has long been known in Marxist literature; recently, however, other schools have begun to recognize it as well. Galbraith (1973), for example, speaks of “bureaucratic symbiosis” in this connection.

¹³See Tardos (1975a, b).

affairs and are patronizing them. The knowledge that everything must be *asked for* creates a feeling of humiliation. They would like to rely on their own resources. This desire is one of the motivating forces behind reforms. It is this that drives the relationship between state and firm towards maturity or, in other words, towards lower degrees of paternalism.

Closely related to this is another factor working in the direction of reducing paternalism: *the frequent dissatisfaction of the public and of the higher leadership with the lack of initiative of lower-level managers*. Let us return for a moment to the analogy. It is known that the child who is over protected by the parents will become passive and helpless. He will get used to decisions being taken and difficulties being overcome for him. The “educational effect” of the higher degrees of paternalism is the same in economic life. Passivity, complaints about difficulties, begging for the help of the state instead of coping with troubles on one’s own initiative are all well known and widespread phenomena. Recognition of the causes and consequences of these phenomena influence public opinion in favor of decentralizing reforms.

The two factors mentioned above are linked with the *behavior* of economic managers. Let us mention a third factor, an *organizational* problem. As we have seen, in economic life the higher degrees of paternalism are associated with the use of the rationing scheme for allocation and distribution. Resources and products can be allocated through administrative rationing to firms, nonprofit institutions, and households only for as long as society remains relatively poor, and production and consumption are little differentiated. In such a situation allocation in kind is a relatively easy task. As production and consumption become increasingly differentiated, however, using the rationing scheme to distribute all inputs becomes increasingly difficult.¹⁴ *Sooner or later differentiation makes a significant decentralization of decision-making and of information necessary, leading to greater independence for micro-organizations.*

The effect of the factors working against extreme forms of paternalism is shown by the fact that—as it seems—the highest Degree 4 (grants in kind—passive acceptance) was not able to remain the dominant or general form of relationship between state and the firm for an extended period.

Degree 3 (grants in kind—with wishes actively expressed) has been the dominant form of relationship between the state and the firm for a long period. The reforms which started in the late fifties and early sixties tried

¹⁴We followed a similar train of thought in section 15.2 in connection with a price formation—a special field of economic administration.

to make further steps towards the lower degrees of paternalism. In Hungary, as can be seen from table 21.1, Degrees 2 and 1 have become dominant.

As was emphasized at the beginning of the present section, in this field there are strong tendencies operating in each direction. The course of history will show which tendency dominates in each socialist country, and how strongly it does so.

22.4. Paternalism and the softening of the budget constraint

Let us revert from historical prediction to present realities. According to table 22.1 Degrees 1–3 of paternalism characterize socialist firms and, it can be added, the nonprofit institutions as well. (Actual distribution may differ by country and by period.) And, if this is so, the question arises of how paternalism is related to shortage, the main subject of the book.

The most important link between the two sets of phenomena is the *soft budget constraint*. Degree 0 of paternalism implies that the budget constraint is perfectly hard. Whatever happens to the financial balance of the firm, the state does not intervene: it collects the taxes imposed by law and that is all. It does not feel “pity” for the firm, or help it out of trouble; if the firm goes bankrupt, that is its own business.

Degree 1 of paternalism means that if the firm is struck by financial difficulties, the state will help it out with tax allowances, credits at advantageous terms, financial grants, taking over the losses, or permitting price increases. It also helps a weak firm, or even a firm operating at a loss, to expand.

If paternalistic intervention occurs in one case in a hundred, the firm does not expect it. However if such interventions are quite frequent, the firm’s behavioral norms are established in expectation of it. This is exactly what we called the soft budget constraint in sections 13.5–13.6. *Paternalism is the direct explanation for the softening of the budget constraint*. And, if this softening occurs, it will entail several phenomena connected with shortage: the almost-insatiable demand for labor and the tendency to hoard it, the almost-insatiable hunger for investment, and so on.

In Chapter 21 we drew up the model of *suction* in which the “pumping” was done by firms and nonprofit institutions. This is very closely connected with paternalism in two respects. One has just been explained: paternalism softens the financial constraints on the firm’s demand. (The tap does not work.) This is why the buyer firm pumps out as much as

possible from firms selling inputs. Moreover, as we have repeatedly pointed out, a hierarchical multilevel system of control operates. Let us now consider not only Degree 1, but also Degrees 2 and 3 of paternalism. *Firms and nonprofit institutions pump not only "horizontally" from other firms supplying them with inputs, but also "vertically" from their superior authorities.*¹⁵ In the Hungarian language exactly this expression is used in the parent-child relation: the child "pumps" his parents. While he is small he asks for more chocolates and ice-cream, when he is bigger he asks for more pocket-money, and later still he will ask for larger family contributions to his first flat or first car. This "pumping" appears in the paternalistic relationship between the firm and its superior authority. If the superior allots materials and labor in kind (Degree 3), the firm or nonprofit institution tries to pump out as much as possible. If money is granted (Degree 2), the firms and nonprofit institutions strive to pump out the largest possible amount of money. "Pumping" may be done—as in the parent-child relationship—in many different ways: in a good case with convincing arguments, in a bad case with complaints or by "lobbying".

It can be seen from the preceding argument that *there is a close relationship between the set of economic phenomena in the strict sense (the soft budget constraint, almost-insatiable demand, horizontal and vertical "pumping") and the set of institutional phenomena (the higher degrees of paternalism): the latter set largely explains the former one.*

22.5. Final remarks: The possibilities for and limits on conscious action

Our final remarks are concerned not only with the subject-matter of the last chapter, but with the whole of the book.

The book has throughout reflected the view that *definite social relations and institutional conditions generate definite forms of behavior, economic regularities and norms. These cannot be invalidated by decisions of the state.* Government decision and state plan have not prescribed the investment tension, the chronic labor shortage, the tendency towards price-drift, and so on, and no government decision or state plan can eliminate them as long as the conditions exist that maintain these phenomena.

It is also impossible to accept with pleasure the beneficial effects of these regularities and to escape entirely from those consequences which we

¹⁵According to Tardos (1972), "... Firms frequently regard the state to be a milch-cow, and the state—in spite of all promises of the authorities—does little or nothing to overcome this attitude."

regard as disadvantageous. It has been demonstrated that participants in the socialist system are motivated by a drive for expansion at every level. Nobody needs encouragement to invest. This is one of the main explanations of fast growth. It is impossible to be pleased about the latter and at the same time to hope that investment tension can be totally eliminated. Potential reserves of labor are absorbed as a result of the incessant expansion drive, and it is this that leads to the chronic labor shortage. It is impossible simultaneously to be pleased that unemployment is eliminated and to hope that sooner or later equilibrium will be restored in the labor market and the harmful effects of labor shortage will cease. The same process leads to welcome consequences and uncomfortable or even harmful ones *at the same time*. It is impossible to accept the former and reject the latter.

This does not mean that the economic policy-maker, the planner, and the practical economic manager are helpless in the face of the regularities and intrinsic tendencies of the system. *The scope for conscious action is wide. We mention only a few possibilities.*

Some tendencies may be strengthened, other ones – with due resistance – may be weakened. We mentioned above the tendency towards price-drift. This cannot be eliminated from economic life by order. Yet it can be resisted. It is inevitable that the suction mechanism works. It does matter, however, whether the central planners, who have the largest pump, lead the overall pumping force, or resist the pumping of subordinate organizations. It is inevitable that the drive for quantity will generate shortage, and that that shortage will intensify quantity drive. Yet it is important whether the central planners themselves demand the tautest possible quantity directives, or try to exert a moderating influence. Economic policy may influence the allocation of shortage among the various sectors.

There is also a further wide area for action: *to reduce frictions in adjustment.* Better organization of production and trade, better coordination of planning, better information to reduce uncertainty – all these belong there. If, for example, a better organization of production releases a few thousand workers, it will not eliminate the labor shortage. There are plenty of vacancies waiting for them, and it would be impossible to release more labor than can be absorbed by incessant expansion. And yet releasing them is highly desirable. It contributes to ensuring that the given resources of the national economy produce greater economic results.

We come to the most important point last. *The institutional conditions, forms of behavior and regularities which produce the phenomena described in this book are not externally imposed or immutable. The Hungarian reform of*

1968 itself illustrates the proposition that deliberate human action can change them. More profound changes of this nature may take place in the future as well and thus modify the phenomena analyzed in this book.

This book has not elaborated concrete proposals for eliminating the phenomena of shortage. As was indicated in Chapter 1, in this work it was intended only to contribute to an exclusively descriptive and explanatory analysis. It is also my conviction that attempts to make a careful and responsible analysis of the situation, and to illuminate the causal relationships more deeply, may help in finding practical solutions to the problems.

APPENDICES

Queuing on the market

CO-AUTHOR: JÖRGEN W. WEIBULL

A.1. Introduction

The present appendix is an excerpt from a longer study.¹ It is closely linked to Chapter 4 of the book, to sections 7.2–7.5 and 7.7, as well as to Chapter 18. It tries to repeat as little as possible what was said in those places. Therefore, the appendix generally does not deal with economic interpretations of the assumptions and propositions, and economic comments are made only where these complement the main subject of the book.

Our main concern is to describe a market which is away from Walrasian equilibrium and nevertheless is in a stationary state, permanently restoring its basic properties. Appraising our own results, although we arrive at a few theorems, we would like to draw attention more to the *analytical framework*, that is to the specific points of view from which we consider the functioning of a market in chronic shortage. Appendix A elaborates a very simple model to introduce the reader to our framework.

One comment should be made here concerning deterministic versus stochastic models of queueing systems. In contrast to other queue models, which are usually stochastic, the present model is deterministic. This choice of approach reflects our belief that in situations characterized by chronic shortage, the stochastic element is secondary in comparison to the interdependencies and feedback mechanisms regulating the system. Although a general model should include stochastic elements as well, some of the fundamental relationships may be explained within a deterministic

¹The longer study is the work of the author and J. W. Weibull; its full text (1977) is available in mimeographed form. Abridged versions are published in Kornai–Weibull (1978a,b).

framework.² Our model is a deterministic stock-flow model, formulated as a system of ordinary differential equations.

The question whether the “buyer” described here is a firm, a nonprofit institution, or a household is left open. Illustrative remarks usually interpret it as household, but that is not meant to restrict the sphere of interpretation.

A.2. The structure of the market

We study a market trading a single *good* G . This can be a specific commodity, or an aggregate composed of different commodities. The good is traded as indivisible items; each buyer will acquire only one item on the occasion of making a purchase.

There is only one *seller* (a monopolist or the aggregate of several individual sellers).

There are n *buyers*. The whole population of buyers is divided into subpopulations called *groups* of buyers. Each group has its own characteristic behavior on the market. We call the representative member of group i a *buyer of type* i . There are k groups, and n_i members in group i :

$$\sum_{i=1}^k n_i = n.$$

The number of participants (one seller, n_1, n_2, \dots, n_k buyers) does not change over time.

Although the model, as formally defined in sections A.8–A.9 is deterministic, it may be viewed as a “hybrid” model consisting of a collection of deterministic relationships between the mean values of various stochastic components. In particular, we focus on a sequence of decisions made by the buyers when shopping. At each such decision stage we model the aggregate behavior of the buyer groups in terms of *flows*; the inflow of buyers into the decision stage and the flow shares out of the decision stage, corresponding to each decision alternative (there are only two options at each decision stage). However, these deterministic flow shares may be regarded as mean values for stochastic individual choice behavior, the shares being identified as choice probabilities. In order to illustrate the deterministic model assumptions we frequently make such micro-oriented,

²We are grateful to Lars-Göran Mattsson who originally suggested this viewpoint.

stochastic interpretations. In the literature on stochastic queuing models, our approach is sometimes referred to as “the fluid approximation”.³

A.3. The shopping algorithm

Somewhat repeating what was said in Chapters 4 and 7, and with some further specifications, we focus on a particular algorithm that we feel has some of the ingredients of real-life situations, while being analytically tractable. We illustrate the shopping process in fig. A.1 in the form of a block diagram. Fig. A.1 is related to figs. 4.1–4.3; it combines some attributes of these earlier figures.

We accompany an individual buyer of type i on his shopping route. He departs from the field labelled START.

His first decision problem is the following. Should he try to buy good G, traded on the market of our model? Or rather, should he buy the *substitute good* H (or a composite aggregate H) traded on another market (outside the scope of our model)? We assume that income and all other factors influencing the buyer’s decision are given and that they are invariant over time. The only signals to be considered at this decision stage are the prices, i.e. the *relative price* $P = p_G/p_H$.

We denote the buyer’s *initial buying propensity* by $\lambda_i(P)$. This is a nonincreasing (usually decreasing) function of P . Given the relative price P , $\lambda_i(P)$ is the fraction of buyers of type i who will decide to look for good G rather than good H. In micro-oriented terms $\lambda_i(P)$ may be interpreted as the probability that the buyer will initially prefer good G to good H.

The model described in the present appendix deviates at this point from the formulation given in Chapters 4 and 7. Here, initial demand is not considered as given, but is described as a function of relative prices. This is compatible with the subject of other chapters of the book. It was stated in Chapter 14 that the firm as buyer *may* react to proportions of input prices, though in a shortage economy such reactions are rather sporadic and not very strong. And in Chapter 18 it was said that the household as buyer reacts strongly to the relative prices of consumer goods and services. In fact, the *generality* of the model is increased by including the possibility of some effects of relative prices. In the case where such effects are absent the function $\lambda_i(P)$ is constant, i.e. $\lambda_i(P) = \lambda_i$ for some constant λ_i .

³See, for example, Kleinrock (1976).

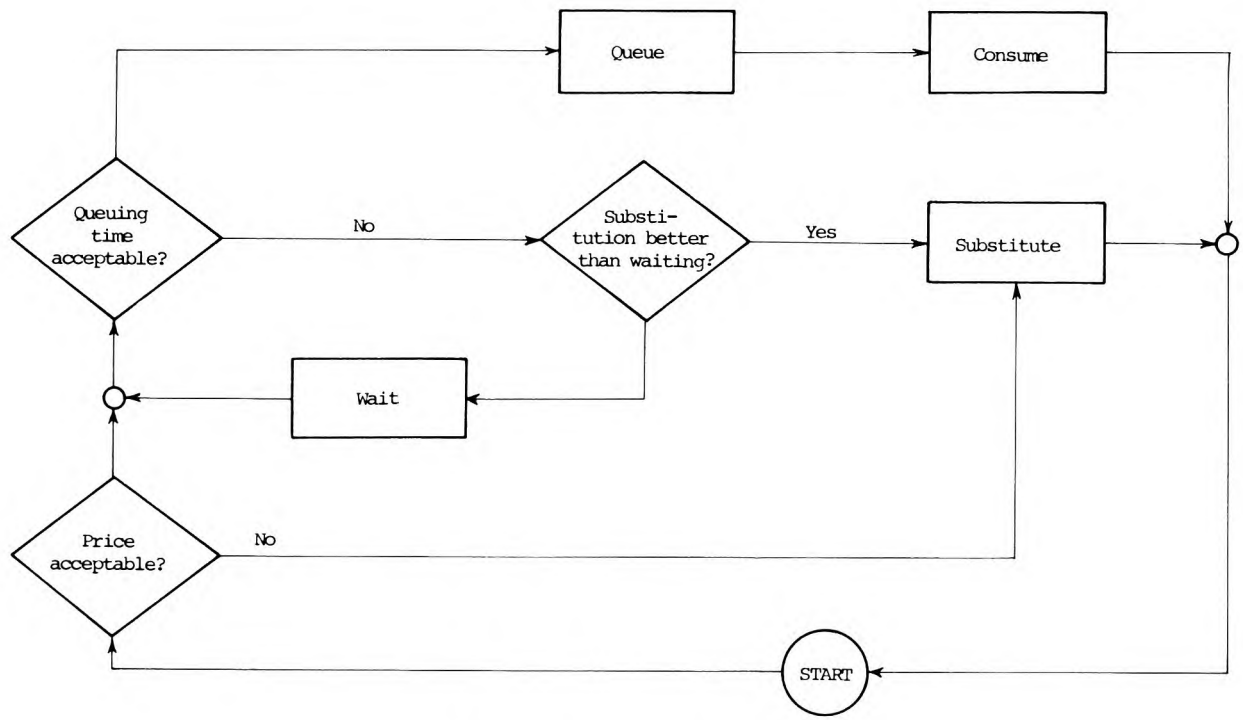


Figure A.1. The shopping algorithm.

Keep in mind the adjective “initial”. It refers to the fact that $\lambda_i(P)$ represents an original buying intention at the beginning of the shopping route – subject to later revision, after encountering the shortage phenomena.

Our buyer proceeds to a sales point. There is a queue. He wonders whether he should join the queue. We assume that there is only one factor influencing his decision, and that is the expected *queuing time*, W . The larger W , the more reluctant the buyer is to join the queue. The quantity $\varphi_i(W)$ expresses the *queuing propensity*. This means that of the total number of type i buyers, interested in purchasing good G, a fraction $\varphi_i(W)$ will join the queue, and the rest, i.e. the fraction $(1 - \varphi_i(W))$, are not willing to join the queue.

Let us assume for a moment that our buyer belongs to the first subgroup, and he enters the queue. He waits in the queue until served, and then he goes home with the newly acquired good. We suppose that after some time has passed, his desire to acquire another item of good G or H arises – and the whole process begins again. The reasons for renewal of the need will not be discussed. Anyway, out of the total number of G-satisfied buyers at time t , we assume that the fraction $\gamma_i dt$ will exhibit a need to acquire another item (of either G or H) in the infinitesimal time interval $(t, t + dt)$. The assumption that this fraction is independent of time t is made here for technical convenience. In micro-oriented terms this assumption implies that the satisfaction time, i.e. the time interval from the date when a buyer acquires an item of good G until the date when a renewed need arises, considered as a random variable, has an exponential probability distribution with mean value $1/\gamma_i$. The quantity γ_i will be called the (post-G) *need renewal rate* and $1/\gamma_i$ will be referred to as the *average G-satisfaction time*.

We now turn to the other branch of the algorithm, to the buyer who was deterred by the long queuing time. He has different options. He may insist on buying good G, but he postpones the decision of whether or not to join the queue. This can be a reasonable action in the case of a real “physical” queue.⁴ The buyer’s behavior is described by two attributes. First, there is a *waiting propensity* denoted by σ_i . And secondly there is a *waiting time*. After that time has elapsed, the buyer returns and considers again whether to join the queue. Here we make a similar assumption as for the G-satisfied buyers, i.e. in the infinitesimal time interval $(t, t + dt)$, the fraction $\psi_i dt$ of

⁴It is not a reasonable option in the case of a “notional” queue, e.g. when serial numbers are distributed among the members of the queue, after which everybody may go home and return when called.

the total number of waiting buyers in group i will return to reconsider joining the queue. In micro-oriented terms, the waiting time is an exponentially distributed random variable with mean value $1/\psi_i$. We call ψ_i the *reconsideration rate* and $1/\psi_i$ the *average waiting time*.

Another option for those who did not join the queue, but do not postpone the purchasing decision, is to substitute good H for good G. We shall call this *forced substitution*. There were some people, the fraction $(1-\lambda_i(P))$ of customers of type i , who made a *voluntary substitution*, based exclusively on the relative prices of G and H. But now some additional substituters follow them, on an involuntary basis. We denote the forced *substitution propensity* by $\mu_i(P)$. (As with the initial buying propensity, we assume that the forced substitution propensity depends only on the relative prices.)

The third option is not to purchase either G or H, and simply keep the money unspent. This can be called *forced saving resulting from shortage*.⁵

Aware of all these options, we introduce some drastic simplifications in the present expository model. We exclude the possibility of forced saving resulting from shortage and assume the following. If the buyer is neither willing to join the queue for G immediately, nor willing to postpone the same decision, then he must be willing to accept forced substitution and to buy good H. This good is always available immediately. One possible interpretation of our assumption is that good H represents the composite commodity "goods other than G". Even with the most severe shortage there is always *something* in the stores. Most of the buyers are willing to spend their money on something, somehow. This is a rather realistic assumption for a large proportion of buyers' decisions in a shortage economy.⁶ Our assumption is represented by the following relationship: $\sigma_i + \mu_i = 1$. To simplify notation, we only use the term μ_i and the waiting propensity is denoted by $(1 - \mu_i)$.

In the case of acquiring good H (owing to voluntary or forced choice) the buyer goes through a similar satisfaction time as in the case of good G. In particular, we assume that in the infinitesimal time interval $(t, t + dt)$, the fraction $\chi_i dt$ of all H-satisfied buyers of type i will exhibit a need to acquire another item (of either good G or H). We call χ_i the (post-H) *need renewal rate* and $1/\chi_i$ the *average H-satisfaction time*.

This brings us to the end of the cycle.

⁵The first option, passive waiting, i.e. postponement of the decision to join the queue for G, may imply *temporary* forced saving as well.

⁶See sections 18.4–18.5.

A.4. The buyers' attitude

To sum up, the *buyers' attitude* is characterized by the following collection of functions and parameters:

$\lambda_i(P)$	= initial buying propensity at relative price P ;
$\varphi_i(W)$	= queuing propensity at queuing time W ;
$\mu_i(P)$	= forced substitution propensity at relative price P ;
$(1 - \mu_i(P))$	= waiting propensity at relative price P ;
γ_i, χ_i	= (post-G) and (post-H) need renewal rates, respectively;
ψ_i	= reconsideration rate.

The functions and parameters listed above describe the attitude of group i . It may be noted that the attitude (considered as a vector) is specified in terms of only two "signals": the relative price P and the queuing time W . Moreover, we have separated the buyers' considerations of these two signals into successive, distinct decision points in the shopping algorithm. Thus, having once accepted the price, the buyers consider queuing time without regard to price. (Joint consideration of price and queuing time may be analyzed without technical difficulty.)

A brief comparison with the usual market models is now in order. As already mentioned, we go along with the traditional description at the first step of the algorithm – the demand function depends on relative prices. The usual model terminates here, with the tacit assumption that it is sufficient to know the buyer's intention. If he wants to buy a given quantity at the price asked for by the seller, he will surely get it. Under the circumstances of *chronic* shortage the same assumption becomes untenable and the description of the buyer's behavior cannot stop here. What will happen after the first step, i.e. after determining the initial demand? In a shortage economy, buying may be described only as a process over time, looking at the original decision and later on at the revisions, choice between further options, etc. Therefore, the following decision points were introduced into the model: joining the queue, waiting, and accepting forced substitution.

A.5. The state variables of the buyers

At any fixed time t , each buyer plays exactly one of four different roles. The number of buyers in each role will be represented in the model by the

following four *state variables*:

$y_{1i}(t)$ = the number of buyers of type i who are queuing at time t ; briefly, the *queuing buyers*;

$y_{2i}(t)$ = the number of buyers of type i who have previously acquired an item of good G and, at time t , are not yet ready to start the shopping process again; briefly, the *G-satisfied buyers*;

$y_{3i}(t)$ = the number of buyers of type i who have previously acquired an item of good H and, at time t , are not yet ready to start the shopping process again; briefly, the *H-satisfied buyers*;

$y_{4i}(t)$ = the number of buyers of type i , who have previously postponed the decision to join the queue, and at time t do not yet reconsider the same decision; briefly, the *waiting buyers*.

$$y_{1i}(t) + y_{2i}(t) + y_{3i}(t) + y_{4i}(t) = n_i, \quad i = 1, \dots, k, \quad t \geq 0.$$

$$y_j(t) = \sum_{i=1}^k y_{ji}(t), \quad j = 1, 2, 3, 4, \quad t \geq 0.$$

In the following analysis all the variables above are treated not as integers but as real numbers. At any time $t \geq 0$, the vector $(y_{11}(t), \dots, y_{1k}(t), y_{21}(t), \dots, y_{2k}(t), y_{31}(t), \dots, y_{3k}(t), y_{41}(t), \dots, y_{4k}(t))$ will be called the state of the buyer population at time t . Conversely, any non-negative real vector $(y_{11}, y_{12}, \dots, y_{4k})$ satisfying $y_{1i} + y_{2i} + y_{3i} + y_{4i} = n_i$ for all i , will be called a *feasible state* for the buyer population.

A.6. Supply rate and effective service flow

We now turn to the description of the seller. In the context of the present model, supply will be represented by the supply rate and trade by the effective service flow.

The *supply rate* of the seller is denoted by S . This is the maximal number of buyers who can be served per unit of time. In the case of a store, S depends on the initial inventories and on the deliveries of supplies to the store. In the case of a productive firm, S depends on the initial inventories and on the production capacity. We disregard inventories and assume that S is time-invariant and fixed exogenously.

As the queue length y_1 is treated here as a continuous variable, it would be natural to let the *effective service flow*, i.e. the actual number of buyers served per time unit, equal S for $y_1 > 0$ and zero for $y_1 = 0$. In other words, full service as long as there is a queue, and no service if there is no queue

(the person being served is included in the queue). However, this “switching rule” type of dependency between the effective service flow (r) and the queue length (y_1) is discontinuous at $y_1=0$, and such a discontinuity would be technically disturbing in the analysis of the dynamics of the system of buyers. Therefore, we replace this discontinuous relationship by a continuous relationship together with a limit argument. More precisely, we first let the effective service flow (r) depend on the queue length (y_1) according to the following equation:

$$r(y_1(t)) = S h_\omega(y_1(t)), \quad (\text{A.1})$$

where h_ω is a continuous function increasing from zero to unity on the interval $[0, \omega]$ and equalling unity on the interval $[\omega, +\infty)$. The parameter ω , called here the “smoothing coefficient”, is assumed to be a small, positive constant. Later in the analysis we let ω approach zero, thereby letting the continuous relationship (A.1) approach the original, discontinuous “switching rule”.

A.7. The queue

All actions of the seller and of the buyers are mutually independent with one exception: the queue is the linkage which makes the participants of the system mutually interdependent.

The queuing time W appears as the argument in the queuing propensities $\varphi_i(W)$ ($i=1, 2, \dots, k$), which does not mean that prospective customers necessarily perceive W correctly – only that their aggregate behavior is a function of W . We consider the case of queues without priorities, so that a newcomer joining the queue has to wait until all the customers standing ahead of him in the queue are served. This motivates the following relationship:

$$W(t) = y_1(t) / S. \quad (\text{A.2})$$

It should be noted that this equation may also be used as an approximation in some cases where there is more than one queue for good G . If there are many queues and the arriving customers always choose the queue with the shortest queuing time, then the queuing times in the different queues will tend to become equal, and eq. (A.2) applies to the aggregate of queues.

The queue consists of members from the different buyer groups. In general, these groups may be more or less well mixed in the queue.

However, for analytical tractability we assume that they are homogeneously mixed. Let $r_i(t)$ denote the outflow of served buyers of type i at time t :

$$r_i(t) = \begin{cases} \frac{y_{1i}(t)}{y_1(t)} r(y_1(t)), & \text{if } y_1(t) > 0, \\ 0, & \text{if } y_1(t) = 0. \end{cases} \quad (\text{A.3})$$

In other words we assume that the outflow of served buyers of type i from the queue is proportional to the share of such buyers among all buyers in the queue. For an initial or transient state of the buyer population, this may indeed be a crude approximation (the queuing members from one buyer group may, for example, stand ahead of all other queuing buyers). In a stationary state, however, the homogeneity assumption is appropriate, granted independent individual behavior.⁷ The quantity r_i will be referred to as the *effective service flow of buyers of type i* ($i = 1, 2, \dots, k$), $r = r_1 + r_2 + \dots + r_k$.

With this discussion of the queue, our description of the institutional and microeconomic elements of the model is complete. (Sections A.2.–A.7.) We now proceed to summarize the model formally.

A.8. Summary of the model: Exogenous parameters and functions

The following *parameters* are assumed to be exogenously given real numbers: $S, P, \gamma_i, \chi_i, \psi_i, (i = 1, 2, \dots, k)$. Let R_+ denote the set of non-negative real numbers and $[0, 1]$ the closed unit interval. The following *functions* are assumed to be exogenously given, defined on R_+ and taking values in $[0, 1]$: $\varphi_i, \lambda_i, \mu_i, h_\omega (i = 1, 2, \dots, k)$.

The assumptions concerning exogenous parameters and functions are as follows. (Observe that the assumed properties of the functions are taken to hold in the whole domain R_+ .)

A1. The parameters S, γ_i, χ_i and $\psi_i (i = 1, 2, \dots, k)$ are all positive. $\psi_i > \chi_i$ for all i . The parameter P is non-negative.

⁷Assumption (A.3) is disturbing from a logical point of view. Namely, with more than one buyer group it may conflict with the interpretation of A.2 in terms of a strictly ordered queue. An alternative interpretation of A.2, which is consistent with A.3, is that the members of the queue are drawn at random for service. Assuming an equal chance of being drawn and average service time per buyer $1/S$, eq. (A.2) gives the expected queuing time and (A.3) the average service flows for the different groups.

A2. The functions $\varphi_i(i=1,2,\dots,k)$ are all nonincreasing with $\varphi_i(0)=1$ and have continuous first derivatives φ'_i .

A3. The functions $\lambda_i(i=1,2,\dots,k)$ are all nonincreasing and continuous with $\lim_{P \rightarrow \infty} \lambda_i(P)=0$.

A4. The functions $\mu_i(i=1,2,\dots,k)$ are all nondecreasing and continuous. If $\lambda_i(P)=0$ for some i and P , then $\mu_i(P)>0$.

A5. The function h_ω ($\omega>0$ being fixed) is increasing on the interval $[0,\omega]$. Moreover, h_ω is twice differentiable and satisfies $h_\omega(0)=0$ and $h_\omega(y)=1$ for every $y \geq \omega$.

These assumptions require a few comments.⁸ First, in A1 we assume that the average H-satisfaction time ($1/\chi_i$) exceeds the average waiting time ($1/\psi_i$). In other words, we think of situations with “short-term” waiting, as compared to consumption time.

Secondly, in A4 we assume that if the relative price is so high that type i buyers have zero initial buying propensity, then they would have positive propensity for forced substitution, provided they were at the decision stage “substitution better than waiting?” in the shopping algorithm (see fig. A.1).

Thirdly, the smoothing function h_ω requires a comment. In the subsequent analysis we first derive results for an arbitrary smoothing function h_ω with $\omega>0$ fixed. We then let ω decrease to zero and establish results for this limiting case (to be distinguished from the case $\omega=0$).

A.9. Summary of the model: Dynamic relationships

As indicated above, we will describe the dynamic evolution over time of the population state variables $y_{1i}(t), y_{2i}(t), y_{3i}(t)$ and $y_{4i}(t), i=1,2,\dots,k$, in terms of a system of (nonlinear) ordinary differential equations. The system is given below (for $i=1,2,\dots,k$):

$$\dot{y}_{1i} = \lambda_i \varphi_i(W) (\gamma_i y_{2i} + \chi_i y_{3i}) + \varphi_i(W) \psi_i y_{4i} - r_i, \tag{A.4}$$

$$\dot{y}_{2i} = r_i - \gamma_i y_{2i}, \tag{A.5}$$

⁸A function φ is said to be increasing (nondecreasing) if $y_1 < y_2$ implies $\varphi(y_1) < \varphi(y_2)$ ($\varphi(y_1) \leq \varphi(y_2)$). It is said to be decreasing (nonincreasing) if $y_1 < y_2$ implies $\varphi(y_1) > \varphi(y_2)$ ($\varphi(y_1) \geq \varphi(y_2)$).

$$\begin{aligned} \dot{y}_{3i} = & \left[1 - \lambda_i + \lambda_i \mu_i (1 - \varphi_i(W)) \right] (\gamma_i y_{2i} + \chi_i y_{3i}) \\ & + \mu_i (1 - \varphi_i(W)) \psi_i y_{4i} - \chi_i y_{3i}, \end{aligned} \quad (\text{A.6})$$

$$\begin{aligned} \dot{y}_{4i} = & \lambda_i (1 - \mu_i) (1 - \varphi_i(W)) (\gamma_i y_{2i} + \chi_i y_{3i}) \\ & + (1 - \mu_i)(1 - \varphi_i(W)) \psi_i y_{4i} - \psi_i y_{4i}. \end{aligned} \quad (\text{A.7})$$

Here all state variables as well as the effective service flows and the queuing time are functions of time, $y_{1i} = y_{1i}(t)$, etc. The effective service flows r_i are defined in eqs. (A.1) and (A.3), and the queuing time W is defined in eq. (A.2). The terms λ_i and μ_i are abbreviations for $\lambda_i(P)$ and $\mu_i(P)$, the relative price P being constant. The dot notation signifies time derivatives, $\dot{y} = dy(t)/dt$. Note that the sum of the time derivatives is zero, $\dot{y}_{1i} + \dot{y}_{2i} + \dot{y}_{3i} + \dot{y}_{4i} = 0$, reflecting the assumption that the number of buyers in each group is constant. Moreover, no state variable can take a negative value; for any feasible state y_{ji} with $y_{ji} = 0$ for some j and i , we have $\dot{y}_{ji} \geq 0$ by eqs. (A.4) and (A.7). Thus, the solution to the system of differential equations is bounded at all times $t \geq 0$. Given the assumed continuity of the first derivatives φ'_i and h'_w , this guarantees the existence and uniqueness of the solution of the system of differential equations at all times $t \geq 0$.⁹

The system of differential equations (A.4)–(A.7) is an aggregate formulation of the description of the individual shopping behavior in section A.3. This correspondence may be studied through a comparison of fig. 7.1, which demonstrates the functioning of the system of differential equations, with fig. A.1, which demonstrates the shopping algorithm.

A.10. The normal state of the market: Existence and uniqueness

The buyer population, as described by the state variables $y_{1i}, y_{2i}, y_{3i}, y_{4i}$ ($i = 1, 2, \dots, k$) is said to be in a *stationary state* if it does not change over time, i.e. if all time derivatives are zero: $\dot{y}_{1i} = \dot{y}_{2i} = \dot{y}_{3i} = \dot{y}_{4i} = 0$ for all i (the system of differential equations being autonomous). In what follows it is first shown that there always exists a unique stationary state. Furthermore, in section A.11 for the special case of a single buyer group, it is shown that this stationary state is stable under fairly mild conditions on the queuing propensity function.

⁹See theorem 3.1 in chapter I of Hale (1969).

Proposition 1. For any collection of parameters and functions satisfying assumptions A1–A5, there exists a unique stationary state.¹⁰

We now study in some detail what happens to the stationary state as we let the smoothing coefficient approach zero. The following two corollaries to the above proposition state that the queue then approaches either a positive value or zero, depending on the given collection of parameters and functions. Let

$$D = \sum_{i=1}^k \frac{\gamma_i \chi_i \lambda_i(P) n_i}{\chi_i \lambda_i(P) + \gamma_i (1 - \lambda_i(P))}, \tag{A.8}$$

$$A_i(W) = \frac{1}{\chi_i} (1 - \lambda_i(P)) + \frac{1}{\gamma_i} \lambda_i(P) + \left[\frac{\mu_i(P)}{\chi_i} + \frac{\lambda_i(P)}{\psi_i} (1 - \mu_i(P)) \right] \left(\frac{1}{\varphi_i(W)} - 1 \right) \quad (i = 1, 2, \dots, k) \tag{A.9}$$

($0 < A_i(W) < +\infty$). Furthermore, let $y_{1i}^*(\omega), y_{2i}^*(\omega), y_{3i}^*(\omega)$, and $y_{4i}^*(\omega), i = 1, 2, \dots, k$, denote the stationary state variable values corresponding to an arbitrary, fixed smoothing coefficient $\omega > 0$.

Corollary 1.1. If $S < D$, then $\lim_{\omega \downarrow 0} y_1^*(\omega) = y_1^*$, where $y_1^* > 0$. Moreover, y_1^* is the unique solution to the equation

$$\sum_{i=1}^k \frac{\lambda_i(P) n_i}{S A_i(y_1/S) + \lambda_i(P) y_1} = 1. \tag{A.10}$$

Let $\varphi_i^* = \varphi_i^*(y_1^*/\lambda)$. For a buyer group i with $\lambda_i(P) > 0$ and $\varphi_i^* > 0$ we have

$$y_{1i}^* = \lim_{\omega \downarrow 0} y_{1i}^*(\omega) = \frac{\lambda_i(P) y_1^* n_i}{S A_i(y_1^*/S) + \lambda_i(P) y_1^*}, \tag{A.11}$$

$$y_{2i}^* = \lim_{\omega \downarrow 0} y_{2i}^*(\omega) = \frac{S}{\gamma_i} \frac{y_{1i}^*}{y_1^*}, \tag{A.12}$$

$$y_{3i}^* = \lim_{\omega \downarrow 0} y_{3i}^*(\omega) = \left[\mu_i(P) \left(\frac{1}{\varphi_i} - 1 \right) + 1 - \lambda_i(P) \right] \times \frac{S}{\lambda_i(P) \chi_i} \frac{y_{1i}^*}{y_1^*}, \tag{A.13}$$

¹⁰Brief references to the proofs are presented in section A.17. For a detailed presentation of the proofs see Kornai–Weibull (1977).

$$y_{4i}^* = \lim_{\omega \downarrow 0} y_{4i}^*(\omega) = (1 - \mu_i(P)) \left(\frac{1}{\varphi_i^*} - 1 \right) \frac{S}{\psi_i} \frac{y_{1i}^*}{y_{1i}^*}. \tag{A.14}$$

For a buyer group j with $\lambda_j(P) = 0$ and/or $\varphi_j^* = 0$ we have $y_{1j}^* = y_{2j}^* = 0$, and y_{3j}^*, y_{4j}^* may be calculated directly from the stationarity conditions.

Corollary 1.2. If $S \geq D$, then $\lim_{\omega \downarrow 0} y_{1i}^*(\omega) = 0$ and for $i = 1, \dots, k$ we have

$$y_{1i}^* = \lim_{\omega \downarrow 0} y_{1i}^*(\omega) = 0, \tag{A.15}$$

$$y_{2i}^* = \lim_{\omega \downarrow 0} y_{2i}^*(\omega) = \frac{\chi_i \lambda_i(P) n_i}{\chi_i \lambda_i(P) + \gamma_i (1 - \lambda_i(P))}, \tag{A.16}$$

$$y_{3i}^* = \lim_{\omega \downarrow 0} y_{3i}^*(\omega) = \frac{\gamma_i (1 - \lambda_i(P)) n_i}{\chi_i \lambda_i(P) + \gamma_i (1 - \lambda_i(P))}, \tag{A.17}$$

$$y_{4i}^* = \lim_{\omega \downarrow 0} y_{4i}^*(\omega) = 0. \tag{A.18}$$

Thus, in the limit, as we let the smoothing coefficient ω approach zero, we may distinguish between two different types of stationary state. For a collection of parameters and functions satisfying the inequality $S < D$, the corresponding stationary state approaches a state with queuing ($y_{1i}^* > 0$), while for a collection of parameters and functions satisfying the opposite inequality, $S \geq D$, the corresponding stationary state approaches a state without queuing. These two types of limiting state will be studied in some detail in sections A.13–A.16. For such a study to be meaningful, however, we have to verify the stability of the stationary state for small, positive values of the smoothing coefficient.

A.11. The normal state of the market: Stability

Only the special case of one group of buyers will be considered here; thus $k = 1$ and the subscript i will be dropped. Moreover, when talking about stability in this context, we mean *asymptotic stability*. Intuitively speaking, a stationary state is called asymptotically stable if, when given a small perturbation in the state space away from the stationary state, the system asymptotically (in time) returns to that stationary state. Thus, asymptotic stability is a local characteristic, indicating only how the system behaves in the neighborhood of the stationary state. More exactly, we use the (standard) definition of asymptotic stability for ordinary differential equations.¹¹

¹¹See, for example, Hale (1969).

In the preceding section it was shown that if $S < D$, then $y_1^*(\omega)$ approaches a positive value as the smoothing coefficient ω approaches zero, while $y_1^*(\omega)$ approaches zero for $S \geq D$. This motivates a division of the stability analysis into two cases. For the case $S < D$ a sufficient condition for stability is that the queuing propensity function φ is “smooth” for all positive queuing times. For the opposite case, $S \geq D$, it is sufficient that φ is “flat” at zero queuing time.

Proposition 2. Consider a buyer population consisting of only one group, $k = 1$, and assume $\lambda(P) > 0$.

(a) Suppose $S < D$. Assume that assumptions A1–A5 hold and moreover that the queuing propensity function φ has a second derivative φ'' for every $W > 0$. There then exists an $\epsilon > 0$ such that the stationary state is asymptotically stable for every smoothing coefficient $\omega \in (0, \epsilon)$.

(b) Suppose $S \geq D$. Assume that assumptions A1–A5 hold and moreover that the queuing propensity function φ is identically equal to unity on some interval $(0, \delta)$. Then the stationary state is asymptotically stable for every smoothing coefficient $\omega \in (0, S\delta)$.

As already mentioned, the above proposition does not tell us how the system reacts to large perturbations away from its stationary state. So far, we have no general results concerning the global behavior of the system. However, for the special case where the possibility of waiting is excluded, it may be shown that the stationary state is indeed globally stable, i.e. the system returns to its stationary state following arbitrarily large perturbations.

Proposition 3. Consider a buyer population consisting of a single group without the possibility of waiting, i.e. $k = 1, \lambda(P) > 0, \mu(P) = 1$, and $y_4(0) = 0$. If assumptions A1–A5 are satisfied, then the system converges asymptotically to its stationary state from any initial state.

To complement the analytical stability studies concerning the special case of one buyer group ($k = 1$), a few numerical computer simulations have been carried out for the case of two buyer groups ($k = 2$). Although our simulation studies were not extensive, we are able to say that all simulations so far show global stability of the system. Typical simulation results are shown in fig. A.2. (See section A.18.) On the basis of our simulations we make the following conjecture.

Conjecture. At least for the case of two buyer groups, $k=2$, there is a fairly wide class of exogenous parameters and functions satisfying assumptions A1–A5, for which the corresponding stationary states are globally stable.

A.12. The interpretation of the normal state

When $y_{1i} = y_{1i}^*, \dots, y_{4i} = y_{4i}^*, i = 1, \dots, k$, the system is in its *normal state*. Some remarks concerning the term “normal” will be in order. (For a more detailed discussion see section 7.7.)

In an empirical descriptive interpretation of the model, the implication is that the normal value is the *intertemporal* mean of a state variable. Hence our model is suitable only as a description of a stationary market. Our conjecture is, however, that the results can be generalized for systems where supply, trade, and consumption are changing (e.g. increasing) over time. (One might, for example, consider the “immigration” of new potential buyers into the market for good G.) In that case we have to redefine the concept of the normal state, which becomes a relative term $(y_{ji}(t)/n_i(t) = \text{constant for all } t \text{ and every } i, j)$. In subsequent comments we refer to the generalized interpretation of the term “normal state”, where the stationary state of our model is only a special case.

For a meaningful interpretation, two formally distinct problems – existence and stability – are thoroughly interconnected. To call any intertemporal mean a “normal value” would be a tautological renaming. What makes an intertemporal mean a “normal value”, indeed, is the operation of a *feedback mechanism*, assuring that the system, departing from its normal state, will be brought “back to normal”. In our simple model the signal guiding the feedback mechanism is W , the queuing time.

In addition to existence and stability, we also have a proposition about the *uniqueness* of the stationary state. This is not an inevitable implication of the concept of a normal state. Our uniqueness proposition is due, among other assumptions, to the deterministic framework of the model. In a stochastic setting, the (unique) stationary state in the present deterministic model must be replaced by a (unique) stationary probability distribution for the state of the system.

Finally, one more remark. As already mentioned in other parts of the book, any normal state can be self-reproducing, self-perpetuating only because it is *accepted as normal* by the members of the system. Queuing, postponing purchases in spite of available financial means, forced substitution – these are social costs, paid by the buyer, in addition to the regular

price paid in money. Therefore the propensities to join the queue, to implement forced substitution, to wait for the purchase, i.e. our functions φ_i , μ_i , and $(1 - \mu_i)$, respectively, express the extent to which the buyers are willing to pay these nonfinancial costs of getting the desired goods. They indicate the socially institutionalized acceptance of the conditions prevailing on the market.

A.13. Change of functions and parameters

We now turn to a study of the normal state in the limiting case $\omega \downarrow 0$, the state variables thus being given in corollaries 1.1 and 1.2. We will compare in sections A.13–A.16 normal state stocks and flows corresponding to different collections of parameters and functions satisfying assumptions A1–A5. Although we are dealing with a dynamic model, a comparison of different normal states of the system leads to results similar to the usual *comparative static* exercises.

First of all the crucial parametric quantity D in eq. (A.8) requires closer examination. According to corollaries 1.1 and 1.2 this quantity is the *minimal queue clearing supply rate*, i.e. if the supply rate S is less than this number, then there will be a queue in the normal state, while there will be no queue in the normal state if S equals or exceeds D . Observe that D depends only on the relative price P , the initial buying propensities λ_i , the need renewal rates γ_i and χ_i , and the sizes of the buyer groups n_i , while it is independent of the queuing propensities φ_i , forced substitution propensities μ_i , reconsideration rates ψ_i , and of course of the supply rate S . The quantity D thus reflects the buyers' attitude concerning price, and need renewal rates. Because of this role of D it is natural to relate it to the concept of demand. For any normal state with no queuing, the inflow (per time unit) of buyers to the seller's place is precisely D ; cf. corollary 1.2. Thus, for any given collection of parameters and functions describing the buyer's attitude and behavior, the quantity D is the potential demand for good G per time unit that would be made by this population of buyers if the system were in a normal state without queuing. (The quantity D generally differs from the flow of potential requests in a particular normal state with queuing. The latter flow, consisting of buyers who would request good G if they did not have to queue, may be calculated from the equations in corollary 1.1.)

Having considered the meaning of the quantity D , we now return to a study of the dependency of the normal state on the supply rate, the relative price and some components of the buyers' attitude. In such a study there

are many aspects of the normal state that require consideration. A natural description of the normal state is simply the distribution of the buyers over the four possible states “queuing”, “G-satisfied”, “H-satisfied”, and “waiting”, as specified by the normal values of the state variables themselves. However, as a complement to these quantities one may also consider the flow of buyers who would buy good G if it were available without queuing (we think of the flow into the last decision point before the queue in fig. A.1). In general, this flow splits into three subflows: one going to the queue, one to forced substitution, and the third to waiting. In a normal state these subflows represent the shares ($i = 1, 2, \dots, k$):

$$\alpha_i^1 = \varphi_i(W^*) \quad (\text{to queuing}), \tag{A.19}$$

$$\alpha_i^2 = (1 - \varphi_i(W^*))\mu_i(P) \quad (\text{to forced substitution}), \tag{A.20}$$

$$\alpha_i^3 = (1 - \varphi_i(W^*))(1 - \mu_i(P)) \quad (\text{to waiting}), \tag{A.21}$$

of the flow of potential customers of type i . This division of the flow may be seen as the buyers’ choice of nonfinancial costs in face of shortage: whether to spend time queuing, buy a less preferred good, or refrain from purchase. In the “nonshortage case”, $S \geq D$, we have $W^* = 0$ and thus $\alpha_i^1 = 1, \alpha_i^2 = \alpha_i^3 = 0$ for all i . In the “shortage case”, $S < D$, however, $W^* > 0$ and all shares may be positive. As to forced substitutions, it may be of interest not only to know the flow shares α_i^2 ($i = 1, 2, \dots, k$) but also the stock shares, i.e. the number of buyers accepting forced substitution among all those making substitutions. For an arbitrary normal state, let this share for buyer group i be denoted R_i^* ($i = 1, 2, \dots, k$). Using the equations in corollaries 1.1 and 1.2 we get the following expression:

$$R_i^* = \frac{\lambda_i(P)\mu_i(P)(1 - \varphi_i(W^*))}{\mu_i(P)(1 - \varphi_i(W^*)) + (1 - \lambda_i(P))\varphi_i(W^*)}, \quad i = 1, 2, \dots, k, \tag{A.22}$$

with R_i^* defined as zero if the numerator is zero. In particular, we see that in the “non-shortage case” $W^* = 0$ and thus $R_i^* = 0$ for all i .

A detailed study of all aspects of the normal state would be very lengthy, to say the least. However, since the normal values of all state variables and indicators are more or less directly related to the normal queuing time W^* , we may focus on this fundamental characteristic in the following analysis without too much loss of completeness.

The normal queuing time W^* is determined in corollaries 1.1 and 1.2 through the identity $W^* = y_1^*/S$. For convenience we restate the result

here. Let the function $K: R_+ \rightarrow R_+$ be defined through

$$K(W) = \sum_{i=1}^k \frac{\lambda_i(P)n_i}{A_i(W) + \lambda_i(P)W}. \tag{A.23}$$

Corollary 1.3. If $S < D$, then $W^* > 0$ and W^* is the unique solution to the equation $K(W) = S$. If $S \geq D$, then $W^* = 0$.

A.14. Dependency on the supply rate

Next, we study how the normal queuing time W^* depends on the supply rate S , all other parameters and functions being fixed (in particular D being a constant). Let us compare the normal queuing time corresponding to a lower supply rate with the normal queuing time corresponding to a higher supply rate. Intuitively one would expect the queuing time to be shorter in the case with the higher supply rate. It follows directly from the monotonicity of the function K that in fact this is the case.

Observation 1. The normal queuing time W^* is a continuous function of the supply rate S . For $S \in (0, D)$ it is positive and decreasing, while for $S \geq D$ it is constantly equal to zero.

The normal queue length y_1^* requires a comment. At first glance one might believe that the qualitative result above would also hold for the normal queue length, i.e. a higher supply rate would yield a shorter queue. However, in the present model we have assumed that it is the queuing time, and not the number of persons in the queue, that influences a potential customer's propensity to join the queue. Therefore, the normal queue length may be related to the supply rate in a nonmonotonic way under fairly reasonable assumptions about the queuing propensity functions. This is the case, for example, if there is a finite upper bound on the acceptable queuing time or, more precisely, if there is a finite W_0 such that $\varphi_i(W_0) = 0$ for all i .

Observation 2. The normal queue length y_1^* is a continuous function of the supply rate S . For $S \in (0, D)$ it is positive and for $S \geq D$ it is constantly equal to zero. If there is a finite upper bound on acceptable queuing time, then $\lim_{S \downarrow 0} y_1^* = 0$.

Thus, as y_1^* is a positive and continuous function of S for $S \in (0, D)$, it cannot be monotonically decreasing throughout the whole interval $(0, D)$. The dependency of the queue length on the supply rate in a typical case is illustrated in fig. A.3. (See section A.18.)

To summarize, a higher supply rate yields a shorter normal queuing time but not necessarily a shorter queue.

A.15. Dependency on the price

We now study how the normal state depends on the relative price P , all other parameters and functions being fixed (in particular S being constant). Before studying the normal state variables, however, we should make some observations about the potential demand D . From the definition in eq. (A.8) it is easily verified that D is a continuous and nonincreasing function of P , and D tends to zero as P tends to infinity. In particular, since S is positive, this implies the existence of a finite P_0 such that $D(P) > S$ for every $P < P_0$ and $D(P) \leq S$ for every $P \geq P_0$ ($P_0 = 0$ possible). From corollaries 1.1 and 1.2 this leads to the following result concerning the existence or nonexistence of a queue in the normal state.

Observation 3. For any fixed supply rate and collection of parameters and functions describing the buyers' attitude, there exists a *minimal queue clearing price*, i.e. a finite relative price P_0 satisfying

$$P < P_0 \Rightarrow y_1^* > 0,$$

$$P \geq P_0 \Rightarrow y_1^* = 0.$$

In other words, there is always a relative price high enough to make the corresponding normal state queue-less. However attractive such a normal state may seem, it should be observed that although there is no queuing at prices above P_0 , the situation is no better in terms of the number of persons served. It is easily verified from corollaries 1.1 and 1.2 that the normal effective service flow r^* satisfies the equation $r^* = \min(S, D)$. Thus, as a function of the relative price P , the normal effective service flow is constantly equal to S in the price interval $(0, P_0)$ while it declines with D in the price interval $(P_0, +\infty)$.

As the minimal queue clearing price P_0 renders the potential demand D equal to the service capacity S , it can be regarded as the *Walrasian market clearing price*. This price is unique in the deterministic framework of the

present model. Below that price there will always be a queue, above it there will never be a queue, *ceteris paribus*.

Let us now consider what happens to the normal queuing time if a low relative price is raised. Intuitively one would expect the normal queuing time corresponding to a higher price not to exceed the normal queuing time corresponding to a lower price. In terms of the present model, this relationship indeed holds.

Observation 4. The normal queuing time W^* is a continuous function of the relative price P . For prices in the interval $(0, P_0)$ it is positive and nonincreasing, while it is constantly equal to zero for prices $P \geq P_0$.

To summarize, *a higher relative price never yields a longer normal queuing time, and there is always a relative price high enough to make the corresponding normal state queue-less.*

A.16. Dependency on the queuing and forced substitution propensities

In the two preceding sections we studied how the normal state depends on such “market control variables” as relative price and supply rate. We now study how the normal state depends on a few components of the buyers’ attitude.

Let us first consider the dependency of the normal queuing time on the queuing propensities of the buyers, all other parameters and functions being fixed. Let $\varphi_1, \varphi_2, \dots, \varphi_k$ and $\eta_1, \eta_2, \dots, \eta_k$ be two alternative collections of queuing propensity functions. If, for every i , $\varphi_i(W) \geq \eta_i(W)$ for all $W > 0$, and, for some i , $\varphi_i(W) > \eta_i(W)$ for all $W > 0$, then the collection of functions $[\varphi_i]$ is said to dominate the collection $[\eta_i]$.

Observation 5. Suppose $S < D$ and that one collection of queuing propensity functions $[\varphi_i]$ dominates another collection of queuing propensity functions $[\eta_i]$. Then the normal queuing time corresponding to the first collection exceeds the normal queuing time corresponding to the second.

In other words, *higher queuing propensities yield a normal state with a longer queuing time.*¹²

¹²Perhaps this sounds self-evident. However, we want to remind the reader of the direction of causality. Queuing propensity can be a decision variable of the buyer, but queuing time will be the joint consequence of the individual decisions, and as such it will be given to each individual. The actual shortage situation depends on the tolerance of the buyers.

Next, let us consider the dependency of the normal queuing time on the forced substitution propensities of the buyers, all other parameters and functions being fixed (in particular the relative price being fixed). Let $[\mu_i]$ and $[\nu_i]$ be two alternative collections of forced substitution propensity functions.

Observation 6. Suppose that one collection of forced substitution propensity functions $[\mu_i]$ dominates another collection of such functions $[\nu_i]$ for all $P \geq 0$. At any fixed relative price P the normal queuing time corresponding to $[\mu_i]$ is less than or equal to the normal queuing time corresponding to $[\nu_i]$.

In other words, *higher forced substitution propensities never yield a longer normal queuing time.*

Observations 5 and 6 support the remark made at the end of section A.12. The constellation of the state variables will depend on the attitudes of the buyers in the different groups. Also, *there is some "trade-off" between the different nonfinancial costs of shortage.* As such costs, we have in mind queuing, waiting, and forced substitution. Observation 6 illustrates one such trade-off. The buyers can achieve a shorter queuing time if they are more willing to accept forced substitution. In general, a decrease in one of these costs, without an increase in other nonfinancial costs, can be assured only by changing the ultimate determining factors: the consumption and voluntary substitution patterns on the one hand and/or the supply rate and price on the other.

As a final remark we note that shifts in the "market control variables" S and P , as well as shifts in the buyers' attitude, in general have distributional effects across buyer groups. For instance, an increase in the relative price may redirect more price-responsive buyer groups to substitution, while other, less price-responsive groups may only get a shorter queuing time without changed consumption pattern. Also, an increased propensity for forced substitution in one buyer group may benefit other groups through a shorter queuing time.

Thus, in addition to the problem of distribution of income, in money terms, which is well studied in the literature, we have here another important aspect: the distribution of the nonfinancial social costs of consumption between the different groups of the population.

A.17. On the proofs of the propositions

As already mentioned in footnote 10, detailed verifications may be found in our earlier publications. In what follows we shall comment on a few of our propositions and observations without aspiring to completeness.

Proposition 1. Stationarity implies the equation $F_\omega(y_1)=1$, where

$$F_\omega(y) = \sum_{i=1}^k \frac{\lambda_i n_i}{A_i(y/S)Sh_\omega(y) + \lambda_i y}.$$

By assumptions A1–A5, F_ω is continuous and (strictly) decreasing with $F_\omega(0) = +\infty$ and $F_\omega(n) < 1$, and thus the equation $F_\omega(y_1)=1$ has a unique root $y_1^*(\omega)$ in the interval $(0, n)$.

Proposition 2. The system of differential equations is linearized at the stationary state.¹³

Proposition 3. The result may be obtained by a geometric analysis of the (y_1, y_2) -phase plane.

Observation 2. For $S < D$, y^* is the root to the equation $H_s(y)=1$, where $H_s(y_1)$ denotes the left-hand side in (A.10). From the hypothesis of a finite upper bound W_0 , it follows that $H_s(y)=0$ for every $y \geq SW_0$ and thus $y_1^* \rightarrow 0$ as $S \rightarrow 0$.

Observation 4. A sufficient condition for the monotonicity result is that the quantity $K(W)$, for any fixed $W > 0$, does not increase with P . A study of the price dependency of $A_i(W)/\lambda_i(P)$ gives the condition.

A.18. Specification of computer simulations

In the simulations underlying the diagrams in figs. A.2 and A.3 the following parameter values and functions were used: $k=2$; $n_1=n_2=50$; $\gamma_1=1$; $\gamma_2=0.5$; $\chi_1=1.5$; $\chi_2=1$; $\psi_1=2$; and $\psi_2=3$.

¹³See corollary 6.1 in chapter II of Hale (1969).

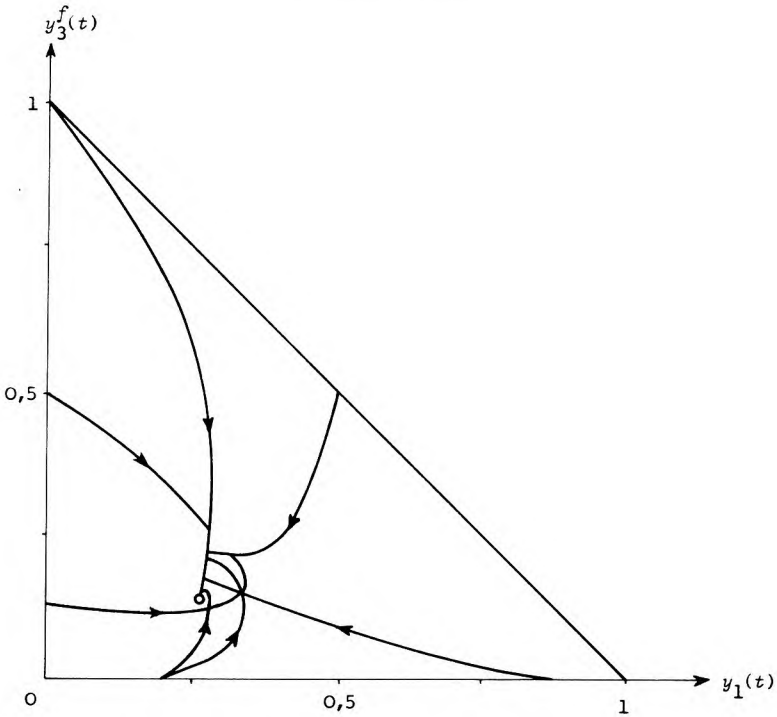


Figure A.2. Typical trajectories on the (y_1, y_3^f) phase plane.

$$h_\omega(y_1) = \begin{cases} 1 - (y_1 - \omega)^2 & y_1 < \omega, \\ 1 & y_1 \geq \omega, \end{cases} \quad (\omega = 1),$$

$$\phi_i(W) = \begin{cases} 1 & W < W_i/2, \\ 2(1 - W/W_i) & W \in (W_i/2, W_i), \\ 0 & W \geq W_i. \end{cases}$$

In fig. A.2, y_1 is the total number of queuing buyers and y_3^f the total number of buyers making forced substitution. The small circle represents the stationary state; all trajectories converge toward this locus. The numerical specification of this simulation is

$$S = 30, \quad \lambda_1 = 0.95, \quad \lambda_2 = 0.90, \quad \mu_1 = 0.5, \quad \mu_2 = 0.25, \quad W_1 = 1, \quad W_2 = 2. \quad -$$

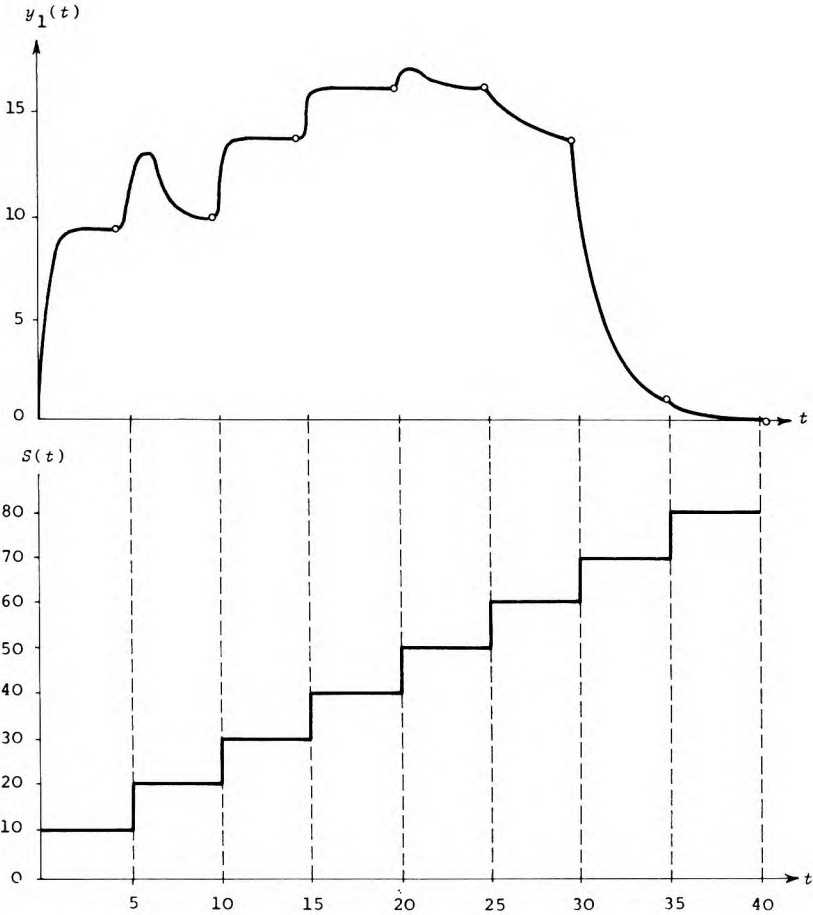


Figure A.3. Typical response in queue length owing to successive, sudden increases in the supply rate.

In fig. A.3 we present the typical development of $y_1(t)$, the length of the queue, in response to successive increases in $S(t)$, the supply rate. In the figure, t denotes time and small circles denote successive normal queue lengths. The numerical specification of this simulation is

$$\lambda_1=0.95, \quad \lambda_2=0.82, \quad \mu_1=0.40, \quad \mu_2=0.22, \quad W_1=0.5, \quad W_2=1.$$

Interrelations between forced substitution, stocks and friction

CO-AUTHOR: ANDRÁS SIMONOVITS

B.1. The prediction error of the seller

In this appendix the models discussed in sections 8.3 and 8.4 will be treated mathematically and in somewhat more general terms. It is assumed that the reader of Appendix B is already familiar with Chapter 8 so that we can use several concepts introduced there without repeating the definitions and their interpretation.

In the present section we examine the problem analyzed in section 8.3. Let us first briefly summarize the assumptions.

Assumption 1. The vector of the buyer's *initial demand* $\mathbf{d} = (d_1, \dots, d_m)$ is given. The sum of its components is D .

Assumption 2. The seller possesses a *prediction* \mathbf{d}^{pred} of the buyer's initial demand and knows D exactly. The vector of the *structure of prediction errors*, \mathbf{b} , is constant, but their size ε varies:

$$\mathbf{d} - \mathbf{d}^{\text{pred}} = \varepsilon \mathbf{b}. \quad (\text{B.1})$$

To simplify the exposition, let us number the errors in diminishing (nonincreasing) order:

$$b_1 \geq b_2 \geq \dots \geq b_k > 0 \geq b_{k+1} \geq \dots \geq b_m. \quad (\text{B.2})$$

Accordingly, the seller has underestimated initial demand for the first k products and correctly estimated or overestimated it for the others.

In order to underline the economic content, \mathbf{b} will be chosen so that the sum of its positive elements equals 1:

$$\sum_{i=1}^k b_i = 1. \quad (\text{B.3})$$

In this case ε represents the sum of the underestimates. This variable will be considered as the *indicator of the prediction error*.

Assumption 3. The seller's stock of product i is proportional to the related prediction of demand, but does not exceed total demand:

$$s_i = \begin{cases} (1 + \lambda)d_i^{\text{pred}}, \lambda > 0, & \text{if } (1 + \lambda)d_i^{\text{pred}} < D, \\ D, & \text{otherwise.} \end{cases} \quad (\text{B.4})$$

Assumption 4. The buyer is willing to accept *forced substitution*. The following conditions are satisfied by the *buying variable* y :

$$y_i = s_i, \quad \text{if } d_i > s_i \quad (\text{shortage good}), \quad (\text{B.5})$$

$$s_i \geq y_i \geq d_i, \quad \text{if } d_i \leq s_i \quad (\text{nonshortage good}),$$

$$y = D. \quad (\text{B.6})$$

It may be seen that with assumption 3, assumption 4 can be satisfied.

In the following the *forced substitution ratio* η will be examined, where

$$\eta = \frac{\sum_{d_i > s_i} (d_i - s_i)}{Y}. \quad (\text{B.7})$$

Let us express the forced substitution ratio as a function of the sum of underestimates and the stock parameter. For given $\mathbf{d}, \mathbf{b}, \varepsilon$ and $\lambda, \mathbf{d}^{\text{pred}}$ and s are unique, thus η is also unique:

$$\eta = \frac{\sum_{i=1}^k (\varepsilon b_i - \lambda d_i^{\text{pred}})_+}{D}. \quad (\text{B.8})$$

In the course of the analysis we let \mathbf{d}^{pred} vary over the set of permissible values.¹ The lower limit on d_i^{pred} is δ , and the upper one is $(D - \varepsilon b_i)$, since $d_i \leq D$ provided that $\varepsilon < D/b_i$, $i = 1, \dots, k$.

¹Attention is drawn to the fact that a model different from that used in section 8.1 is being applied here. In section 8.1 every element of \mathbf{d}^{pred} was assumed to equal D/m .

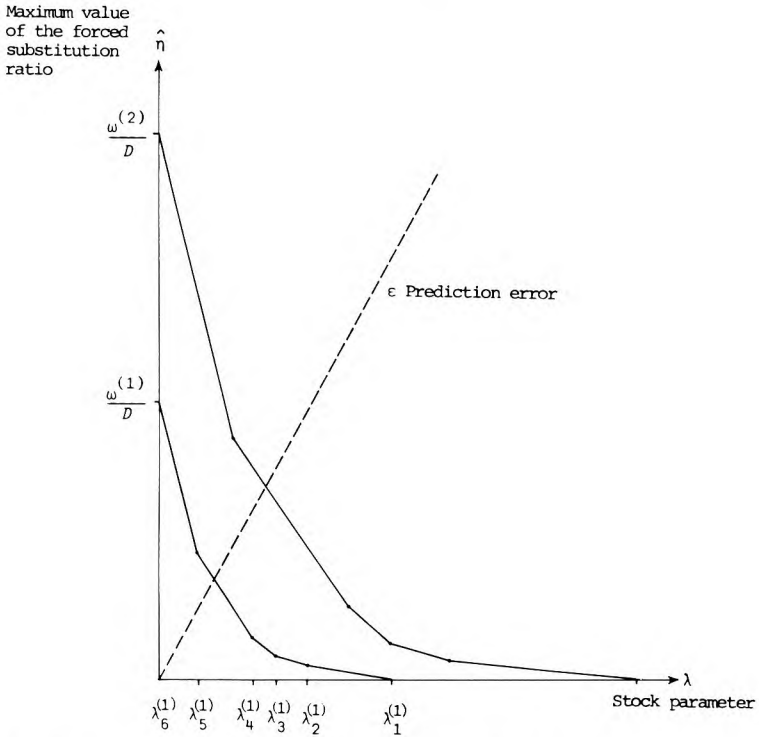


Figure B.1. Relationship of the forced substitution ratio, volume of product stock, and the seller's prediction error.

Obviously $(\epsilon b_i - \lambda d_i^{\text{pred}})_+$ is maximum if and only if $b_i > 0$ and d_i^{pred} is minimum, that is if $d_i^{\text{pred}} = \delta$. Since (apart from the divisor D) η is the sum of the terms $(\epsilon b_i - \lambda d_i^{\text{pred}})_+$, η is maximum only if every term is maximum. It follows that the maximum of η , to be denoted by $\hat{\eta}$ and called the *maximum value of the forced substitution ratio*, is yielded by the following formula:

$$\hat{\eta} = \frac{\sum_{i=1}^k (\epsilon b_i - \lambda \delta)_+}{D}. \tag{B.9}$$

Let us introduce *the critical value of the stock parameter of product i* , λ_i , which just eliminates the shortage of the product in question with the

minimum demand prediction (that is $d_i^{\text{pred}} = \delta$):

$$\lambda_i = \frac{\epsilon b_i}{\delta}, \quad i = 1, \dots, k. \quad (\text{B.10})$$

According to our earlier assumption

$$\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_k > 0 = \lambda_{k+1} = \dots = \lambda_m. \quad (\text{B.11})$$

It can easily be seen that for $\lambda \in [\lambda_i, \lambda_{i-1}]$, ($\lambda_0 = D/\delta - 1$)

$$\hat{\eta} = \frac{\epsilon \sum_{h=1}^{i-1} b_h - \lambda \delta (i-1)}{D}. \quad (\text{B.12})$$

Formula (B.12) is illustrated in fig. B.1 for the case $k = 5$. In fig. 8.2 the special case was illustrated when there are altogether two products and the demand for one of them has been underestimated by the seller (that is $m = 2, k = 1$).

B.2. Vacillation of the buyer

The following analysis is related to section 8.4. Assumptions 1, 3 and 4 reviewed in the preceding section will continue to hold, while assumption 2, as will be seen, undergoes a modification. For the inaccuracy in the prediction of demand derives not simply from the ignorance of the seller, but from the vacillation of the buyer as well.

Two new assumptions will be introduced.

Assumption 5. Demand is a random variable. In order to simplify the analysis we assume that the random part of the demand, that is the difference between demand and its mean value, belongs to a given family of distributions. More exactly, let \mathbf{h} be a random vector with zero mean value. Then

$$\mathbf{d} = \bar{\mathbf{d}} + \gamma \mathbf{h} \quad (\text{B.13})$$

yields demand. The scalar $\gamma \geq 0$ will be called the *vacillation parameter*.

Assumption 6. The distribution of \mathbf{h} is continuous.

On the basis of assumptions 5 and 6 we now modify assumption 2 of the preceding section.

Assumption 2'. The seller knows the mean value of demand exactly, but does not know the demands themselves, not even the distribution of h . $d^{\text{pred}} = \bar{d}$.

When analyzing the problem we know the distribution of h , thus also the distribution of the forced substitution ratio. As an indicator of forced substitution we use the $\eta^{(\pi)}$ quantile, the safety value of the forced substitution ratio with probability π . Since the distribution of η is also continuous, $\eta^{(\pi)}$ can be uniquely determined from the equation $P(\eta < \eta^{(\pi)}) = \pi$. As evidenced by the formula

$$\eta = \frac{\sum_{i=1}^m (\gamma h_i - \lambda \bar{d}_i)_+}{D}, \tag{B.14}$$

if $\eta > 0$, η is an increasing function of γ and a diminishing function of λ . The same holds for $\eta^{(\pi)}$, provided that $\eta^{(\pi)} > 0$. (Of course, in the case $\eta^{(\pi)} = 0$ a reduction in γ or an increase in λ does not and cannot reduce $\eta^{(\pi)}$.) This relationship is illustrated in fig. B.2.

Our line of reasoning is illustrated with the aid of an *example*: there are only *two products* on the market and the distribution of demand is *uniform*. For the sake of simplicity we also assume that both mean values are the same: $\bar{d}_1 = \bar{d}_2 = D/2$. Since both d_1 and d_2 are non-negative, they are situated in the interval $[0, D]$. Let h_1 be a random variable with uniform distribution in the interval $[-D/2, D/2]$. Then both d_1 and d_2 are random variables with uniform distribution in the interval

$$\left[\frac{1-\gamma}{2} D; \frac{1+\gamma}{2} D \right], \quad 0 < \gamma \leq 1.$$

In the case of two products – with the given assumptions – at most one of the products can be a shortage good. Because of the assumption of symmetry the distribution of shortage is identical with both. It is thus sufficient to examine the case when only the first product can be a shortage good, $h_1 > 0$.

The probability that $\eta < x$ is the ratio

$$\left(xD + \frac{\lambda}{2} D \right) / \frac{\gamma}{2} D.$$

(The xD in the numerator relates to a positive shortage smaller than x , and

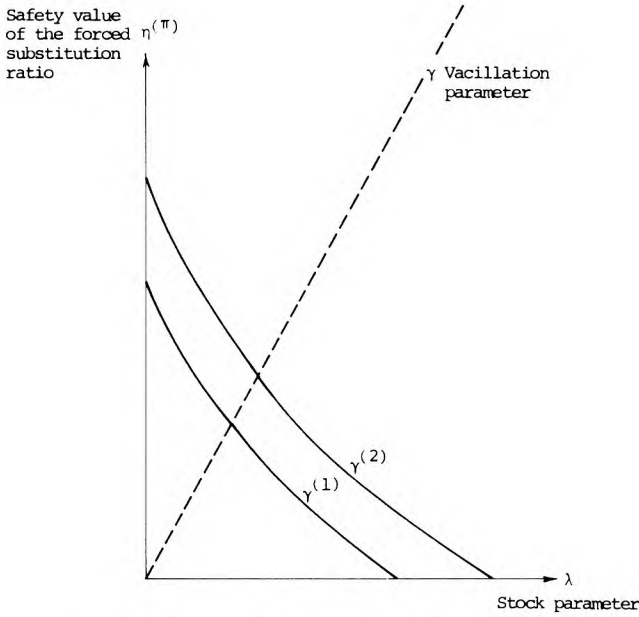


Figure B.2. Relationship of the forced substitution ratio, the volume of product stock, and the buyer's vacillation.

the $(\lambda/2)D$ to zero shortage. The $(\gamma/2)D$ in the denominator represents all cases when $h_1 > 0$.)

Since the probability of the event $\eta \geq x$ is $(1 - \pi)$, and this event may equally come about with $h_1 > 0$ and $h_1 < 0$,

$$\frac{x D + (\lambda/2) D}{(\gamma/2) D} = 1 - \frac{1 - \pi}{2}. \tag{B.15}$$

Rearranging our equation and writing $\eta^{(\pi)}$ instead of x we get the following formula:

$$\eta^{(\pi)} = \left[\frac{\gamma(1 + \pi)}{4} - \frac{\lambda}{2} \right]_+. \tag{B.16}$$

The relationship in formula (B.16) is presented in fig. 8.3. We note that when $\pi = 1$ and $\gamma = 1$

$$\hat{\eta} = \left[\frac{1}{2} - \frac{\lambda}{2} \right]_+. \tag{B.17}$$

References

The list of references uses the following abbreviations: Bp=Budapest, KJK=Közgazdasági és Jogi Könyvkiadó (Publishing House in Economics and Law), and UP=University Press.

In some cases the first edition of a work has to be distinguished from the later edition used in the present book. In such cases the date of the first edition is shown in parentheses. All other data, i.e. place of publication, publisher's name, and finally the second date, refer to the later edition used in the present book.

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