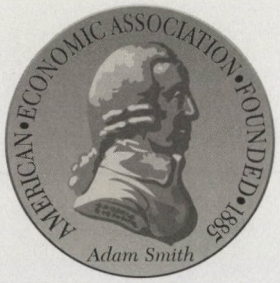
DECEMBER 2003
VOLUME XLI
NUMBER 4

JOURNAL OF ECONOMIC LITERATURE



ARTICLES

János Kornai, Eric Maskin, and Gérard Roland
Understanding the Soft Budget Constraint

Stefan Szymanski
The Economic Design of Sporting Contests

James Konow
Which Is the Fairest One of All?
A Positive Analysis of Justice Theories

Amartya Sen
Sraffa, Wittgenstein, and Gramsci

David Laidler
Meltzer's *History of the Federal Reserve*

also BOOK REVIEWS and NEW BOOK LISTINGS

SEE http://www.e-jel.org for Journal Article Indexes

THE AMERICAN ECONOMIC ASSOCIATION

• BUSINESS CORRESPONDENCE relating to subscriptions and changes of address, advertising, and permission to reprint or quote should be sent to the American Economic Association, 2014 Broadway, Suite 305, Nashville, TN 37203. **Change of address notice must be received at least six (6) weeks prior to the publication month. A membership or subscription paid twice is automatically extended for an additional year unless otherwise requested.**

• EDITORIAL CORRESPONDENCE pertaining to articles and book reviews should be sent to: Professor John McMillan, Editor, *Journal of Economic Literature*, Graduate School of Business, Stanford University, 518 Memorial Way, Stanford, CA 94305-5015.

• SEND BOOKS FOR ANNOTATION OR REVIEW to: Mrs. Drucilla Ekwurzel, Associate Editor, *Journal of Economic Literature*, 4615 Fifth Avenue, Pittsburgh, PA 15213-3661. Send also to this address correspondence pertaining to annotation of books, listing and abstracting of articles, the online *Economic Literature Index* and EconLit on CD-ROM (further information follows the Table of Contents).

• The articles indexed in this issue are those articles with economic material from journals with which the *Journal of Economic Literature* has a contents listing agreement. Abstracts are published in accordance with separate abstracting agreements with the editors of selected journals.

• No responsibility for the views expressed by authors and reviewers in the *Journal of Economic Literature* is assumed by the editors or by the publisher, the American Economic Association.

• The *JOURNAL OF ECONOMIC LITERATURE* (ISSN 0022 0515) is published quarterly (March, June, September, December) by the American Economic Association. Annual fees for regular membership, of which 30 percent is for a year's subscription to this journal, are $64.00, $77.00, or $90.00 depending on income. A membership also includes the *American Economic Review* and the *Journal of Economic Perspectives*. In countries other than the U.S.A., add $30.00 for extra postage. Information on becoming a member can be found on the last page of this journal. Periodicals postage paid at Nashville, TN, and at additional mailing offices.
POSTMASTER: Send address changes to the *Journal of Economic Literature*, 2014 Broadway, Suite 305, Nashville, TN 37203, USA.

The Journal of ECONOMIC LITERATURE

VOLUME XLI December 2003 NUMBER 4

ARTICLES

Understanding the Soft Budget Constraint
János Kornai, Eric Maskin, and Gérard Roland 1095
The Economic Design of Sporting Contests *Stefan Szymanski* 1137
Which Is the Fairest One of All?
A Positive Analysis of Justice Theories *James Konow* 1188
Sraffa, Wittgenstein, and Gramsci *Amartya Sen* 1240
Meltzer's *History of the Federal Reserve* *David Laidler* 1256

BOOK REVIEWS

ALONSO, IRMA T., ed. Caribbean Economies in the Twenty-First Century ..... *Andrew S. Downes* 1321
AOKI, MASAHIKO Toward a Comparative Institutional Analysis ..... *Paul Seabright* 1281
AUERBACH, ALAN J. and MARTIN FELDSTEIN, eds. Handbook of Public Economics: Volume 3 ..... *Thomas J. Nechyba* 1301
AUMANN, ROBERT J. AND SERGIU HART, eds. Handbook of Game Theory with Economic Applications. Volume 3 ..... *Guillermo Owen* 1276
BARTIK, TIMOTHY J. Jobs for the Poor: Can Labor Demand Policies Help? ..... *Steven Raphael* 1308
BAUWENS, LUC AND PIERRE GIOT Econometric Modelling of Stock Market Intraday Activity ..... *Clara Vega* 1294
BEITO, DAVID T.; PETER GORDON, AND ALEXANDER TABARROK, eds. The Voluntary City: Choice, Community, and Civil Society ..... *D. Andrew Austin* 1329

Book Reviews cont.

BHAGWATI, JAGDISH, ed. Going Alone: The Case for Relaxed Reciprocity in Freeing Trade ..... *Gary P. Sampson* 1286

BHALLA, SURJIT S. Imagine There's No Country: Poverty, Inequality, and Growth in the Era of Globalization ..... *Arvind Panagariya* 1288

BLANK, REBECCA M. AND RON HASKINS, eds. The New World of Welfare ..... *Sanders Korenman* 1303

BOLLE, FRIEDEL AND MARCO LEHMANN-WAFFENSCHMIDT, eds. Surveys in Experimental Economics: Bargaining, Cooperation and Election Stock Markets ..... *Glenn W. Harrison* 1277

BORTZ, JEFFREY L. AND STEPHEN HABER, eds. The Mexican Economy, 1870–1930: Essays on the Economic History of Institutions, Revolution, and Growth ..... *José L. Negrin* 1315

BRAUER, JURGEN AND KEITH HARTLEY, eds. The Economics of Regional Security: NATO, the Mediterranean, and Southern Africa ..... *Lloyd J. Dumas* 1299

BRENNER, ROBERT The Boom and the Bubble: The US in the World Economy ..... *Michael Perelman* 1282

BRODY, EVELYN, ed. Property-Tax Exemption for Charities: Mapping the Battlefield ..... *John A. Swain* 1311

CARMICHAEL, JEFFREY AND MICHAEL POMERLEANO The Development and Regulation of Non-Bank Financial Institutions ..... *Robert E. Litan* 1296

COLEMAN, WILLIAM OLIVER Economics and its Enemies: Two Centuries of Anti-Economics ..... *David Colander* 1275

CORDEN, W. MAX Too Sensational: On the Choice of Exchange Rate Regimes ..... *John Williamson* 1289

COWEN, TYLER Creative Destruction: How Globalization Is Changing the World's Cultures ..... *William J. Baumol* 1331

DNES, ANTONY W. AND ROBERT ROWTHORN , eds. The Law and Economics of Marriage and Divorce ..... *Shoshana Grossbard-Shechtman* 1309

DOBSON, WENDY AND GARY CLYDE HUFBAUER, ASSISTED BY M. HYUN KOO CHOO World Capital Markets: Challenge to the G-10 ..... *Kenneth M. Kletzer* 1293

DOUGHERTY, PETER J. Who's Afraid of Adam Smith? How the Market Got Its Soul ..... *Rob Norton* 1274

ENGERMAN, STANLEY L. AND ROBERT E. GALLMAN, eds. The Cambridge Economic History of the United States. Volume 3. The Twentieth Century ..... *John Wallis* 1316

GARBADE, KENNETH D. Pricing Corporate Securities as Contingent Claims ..... *Sanjay K. Nawalkha* 1297

GOMORY, RALPH E. AND WILLIAM J. BAUMOL Global Trade and Conflicting National Interests ..... *Alejandro Cuñat* 1290

GORGA, CARMINE The Economic Process: An Instantaneous Non-Newtonian Picture ..... *Paul Davidson* 1284

HARRISON, GLENN W., ET AL., eds. Using Dynamic General Equilibrium Models for Policy Analysis ..... *John Piggott* 1278

[HILDENBRAND, WERNER] Economic Essays: A Festschrift for Werner Hildenbrand. Edited by GÉRARD DEBREU, WILHELM NEUEFEIND, AND WALTER TROCKEL ..... *Myrna Wooders* 1272

HINES, JAMES R., JR., ed. International Taxation and Multinational Activity ..... *David G. Hartman* 1300

KASERMAN, DAVID L. AND A.H. BARNETT The U.S. Organ Procurement System: A Prescription for Reform ..... *R. Larry Reynolds* 1304

Book Reviews cont.

KLEINKNECHT, ALFRED AND PIERRE MOHNEN, eds. Innovation and Firm Performance: Econometric Explorations of Survey Data ..... *Emmanuel Duguet* 1322
[KRUEGER, ANNE O.] Trade, Development and Political Economy: Essays in Honour of Anne O. Krueger. Edited by DEEPAK LAL AND RICHARD H. SNAPE ..... *Bernard Hoekman* 1324
LEVIN, HENRY M., ed. Privatizing Education: Can the Marketplace Deliver Choice, Efficiency, Equity, and Social Cohesion? ..... *Eric Bettinger* 1305
LITAN, ROBERT E. AND ALICE M. RIVLIN Beyond the Dot.coms: The Economic Promise of the Internet ..... *Michael J. Mandel* 1312
LOAYZA , NORMAN AND RAIMUNDO SOTO, eds. Inflation Targeting: Design, Performance, Challenges ..... *Kenneth N. Kuttner* 1285
MCKENZIE, LIONEL W. Classical General Equilibrium Theory ..... *Karl Vind* 1280
MUSSA, MICHAEL Argentina and the Fund: From Triumph to Tragedy ..... *Andrés Velasco* 1291
NEWHOUSE, JOSEPH P. Pricing the Priceless: A Health Care Conundrum ..... *Åke G. Blomqvist* 1307
POMFRET, RICHARD Constructing a Market Economy: Diverse Paths from Central Planning in Asia and Europe ..... *Nicholas Hope* 1328
ROBINSON, MARGUERITE S. The Microfinance Revolution: Sustainable Finance for the Poor ..... *Sanjay Jain* 1325
SARGENT, THOMAS J. AND FRANÇOIS R. VELDE The Big Problem of Small Change ..... *Angela Redish* 1318
STEIL, BENN; DAVID G. VICTOR, AND RICHARD R. NELSON , eds. Technological Innovation and Economic Performance ..... *Rebecca Henderson* 1327
SYMEONIDIS, GEORGE The Effects of Competition: Cartel Policy and the Evolution of Strategy and Structure in British Industry ..... *Thomas S. Ulen* 1313
USSELMAN, STEVEN W. Regulating Railroad Innovation: Business, Technology, and Politics in America, 1840–1920 ..... *Louis Cain* 1319

ANNOTATED LISTING OF NEW BOOKS 1333

JEL CLASSIFICATION SYSTEM FOR BOOKS 1449

DOCTORAL DISSERTATIONS IN ECONOMICS 1461

GENERAL INDEX FOR VOLUME XLI 1485

Articles 1487

Book Reviews 1488

Index of Authors of New Books 1495

• Composed and printed by QuebecorWorld/Kingsport, Tennessee 37662, U.S.A.

The following Statement of Ownership, Management, and Circulation is provided in accordance with the requirements as contained in 39 U.S.C. 3685. The *Journal of Economic Literature* is owned, managed, and published by the American Economic Association, a nonprofit scientific organization, located at 2014 Broadway, Suite 305, Nashville, Davidson County, TN 37203-2418. The Editor is Professor John McMillan, *Journal of Economic Literature*, Graduate School of Business, Stanford University, 518 Memorial Way, Stanford, CA 94305. During the preceding twelve months, the average number of copies printed for each issue was 21,438; the average paid circulation, 17,267; the average free distribution, 266; the average number of copies distributed, 17,533. Corresponding figures for September 2003, the issue published nearest to filing date: total number of copies printed, 20,820; total paid circulation, 16,977; total free distribution, 415; total distribution, 19,392.

Computer Access to the
***American Economic Association's* Bibliographic Database**

EconLit (1969 - Present)

Published by the

American Economic Association

***Journal of Economic Literature*, 4615 Fifth Avenue, Pittsburgh, PA 15213, USA**
412-268-1039 Phone, 412-268-6810 Fax, info@econlit.org E-mail

http://www.econlit.org Web site

The **American Economic Association's** electronic bibliography, ***EconLit***, indexes more than 30 years of economics literature compiled and abstracted in an easily searchable format from sources worldwide. *EconLit* is an expanded version of the *e-JEL* database, a comprehensive index of journal articles, books, book reviews, collective volume articles, and dissertations. *EconLit* contains the Cambridge University Press *Abstracts of Working Papers in Economics* and recent *JEL* book reviews. Visit the *EconLit* Web site at **http://www.econlit.org** for a detailed contents description and Internet links to publishers of the indexed journals.

EconLit is provided through libraries and universities throughout the world.
To obtain information on access, libraries should contact any of the service providers listed below.

Cambridge Scientific Abstracts Web Service

Cambridge Scientific Abstracts	Phone:	800-843-7751
7200 Wisconsin Avenue	Fax:	301-961-6720
Bethesda, MD 20814	Internet:	http://www.csa.com

Dialog Online and Web Services on File 139

The Dialog Corporation	Phone:	800-334-2564
2440 El Camino Real	Fax:	650-254-8123
Mountain View, CA 94040	Internet:	http://www.dialog.com

Ebscohost Web Service

EBSCO Information Services	Phone:	800-871-8508
P.O. Box 1943	Fax:	978-356-5640
Birmingham, AL 35201-1943	Internet:	http://www.epnet.com

OCLC FirstSearch Online and Web Services

OCLC	Phone:	800-848-5878
6565 Frantz Road	Fax:	614-764-6096
Dublin, OH 43017-3395	Internet:	http://www.oclc.org

OVID Online, Web, or CD-ROM Services

Ovid Technologies, Inc.	Phone:	800-950-2035
333 Seventh Avenue	Fax:	212-563-3784
New York, NY 10001	Internet:	http://www.ovid.com

ScienceDirect Web Services

ScienceDirect	Phone:	888-615-4500
650 Avenue of the Americas	Fax:	212-633-3680
New York, NY 10011	Internet:	http://www.sciencedirect.com

Silver-Platter Web or CD-ROM Services

SilverPlatter Information, Inc.	Phone:	800-343-0064
100 River Ridge Drive	Fax:	781-769-8763
Norwood, MA 02062-5026	Internet:	http://www.silverplatter.com

AEA Members: See next page to order your personal copy of *EconLit*-AEA.
***EconLit*-AEA w/SilverPlatter search software and the most recent 15 years of the database is an annual CD-ROM at only $85 plus postage and handling.**

For AEA Members Only!

EconLit-AEA

New Prices $85 plus postage and handling

Published by: The American Economic Association (AEA)
for AEA members only

The **most recent 15 years of the EconLit Database** and SilverPlatter® search software on CD-ROM!

The established, reliable database for literature searches in economics; an **expanded, searchable** version of the *JOURNAL OF ECONOMIC LITERATURE!*

Hardware Requirements

IBM PC or compatible	**Apple Macintosh**
1 MB of RAM	MacPlus, SE or II series
4 MB hard disk drive	2 MB RAM
PC DOS or MS DOS ver. 3.1 or higher	20 MB hard disk drive System 6.0.3 or higher

MS DOS CD-ROM Extensions 2.0 or higher

ISO-compatible CD-ROM drive

ORDER INFORMATION* — Please check appropriate boxes:

AEA Members may purchase ☐ one edition per year. The current CD-ROM will be shipped until the supply runs out. If supply runs out you will receive the next available CD-ROM.

(Please allow up to four (4) weeks for delivery after shipping date).

☐ **March Edition .... Shipping April** ☐ **September Edition ... Shipping October**
☐ **June Edition .....Shipping July** ☐ **December Edition ... Shipping January**

NEW PRICES ARE EFFECTIVE IMMEDIATELY.

☐ U.S. & Canada $85 + $ 5 (shipping) = $90
☐ Elsewhere $85 + $15 (shipping) = $100

Membership:

☐ **I am an AEA member.**
☐ Please send me a membership application. (Membership forms are downloadable at AEA's Web site: http://www.vanderbilt.edu/AEA/mbr.htm).

Method of Payment: No phone orders please.
Enclosed is my check for $_____payable to the **American Economic Association.**
(Checks must be drawn on a U.S. Bank, payable in U.S. dollars).

Charge $_____ to: ☐ MasterCard ☐ VISA or ☐ AMEX

Account #: _____Exp. Date:_____

Name on Account: _____Signature:_____
(please print or type) (required for all credit card payments)

Ship to my Address:

Name_____

Address_____

City_____State/Province_____Zip_____

Country_____Telephone ( )_____

Email Address_____Fax ( )_____
(optional) (optional)

***License restricted to personal use. Sorry, no purchase orders. CD may be purchased once a year only. No free trials. EconLit-AEA coverage limited to 14-15 years as distinguished from the complete EconLit database (1969-present) for libraries and institutions via licensed service providers.**

Send to: American Economic Association
Journal of Economic Literature - Dept. JEL
4615 Fifth Ave., Pittsburgh, PA 15213-3661

PH: 412-268-1039
FAX: 412-268-6810
http://www.econlit.org


AMERICAN
ECONOMIC
ASSOCIATION

Journal of Economic Literature
Vol. XLI (December 2003) pp. 1095–1136

Understanding the Soft Budget Constraint

JÁNOS KORNAI, ERIC MASKIN, AND GÉRARD ROLAND[1]

1. *Introduction*

The term "soft budget constraint" (SBC)[2] has become a familiar part of the economics lexicon. Originally formulated by Kornai (1979, 1980, 1986) to illuminate economic behavior in socialist economies marked by shortage, the concept of SBC is now regularly invoked in the literature on economic transition from socialism to capitalism. Indeed, SBC problems currently constitute a central policy issue in transition economies. But the concept is increasingly acknowledged to be pertinent well beyond the realm of socialist and transition economies. A host of capitalist phenomena, such as the collapse of the banking sector of East Asian economies in the 1990s, can be usefully thought of in SBC terms.

We have two main objectives in this paper. The first is conceptual clarification. Although the intuitive meaning of SBC was reasonably clear from the outset, there is still no consensus on a precise definition. Of course, such ambiguity about a central concept is not uncommon in the social sciences. Interpretations change and develop over time, as experience in applying the concept accumulates. Hence we do not intend to adjudicate the differences of opinion and declare which definition is "correct." We believe, however, that the interpretation presented here is comprehensive enough to embrace most research on the subject.

The concept of SBC has been invoked by two distinct groups of economists. First, it has been a workhorse for those involved in studying and formulating policy for post-socialist economies. There has hardly been a report on transition—by the World Bank, the EBRD, or other agencies—in the last decade in which the expressions "soft-" and "hard budget constraint" have not appeared prominently (see, for instance, World Bank 1997, 1999; EBRD 1998, 1999, 2000, 2001). Second, there is a sizable group of theorists who have attempted to model the SBC phenomenon formally. A large formal literature has developed, much of it evolving from Mathias Dewatripont and Eric Maskin (1995). In this paper, we attempt to lay out a conceptual apparatus acceptable in both genres and therefore useful for integrating research programs. In addition

[1] Kornai: Harvard University and Collegium Budapest. Maskin: Institute for Advanced Study, Princeton, and Princeton University. Roland: UC Berkeley, CEPR, and WDI. We express our gratitude to the editor, John McMillan, and to two anonymous referees for valuable comments and suggestions. Kornai is grateful to János Varga, Brian McLean, and Julianna Parti for their devoted research and editorial assistance, and to the Hungarian National Science Foundation (OTKA, Project 265 of Hungary's National Scientific Research Fund) for financial support. Maskin thanks the NSF for research support. Roland acknowledges support from ACE grant no. P 98–1008-R.

[2] HBC correspondingly stands for "hard budget constraint."

to interpreting the SBC concept, we suggest ways that "softness" might in fact be measured. Conceptual clarification and some discussion of measurement are taken up primarily in section 2.

Our other purpose in this paper is to survey the formal theoretical literature on SBC and to show that a rich variety of simple models can be developed that cover the situations discussed in section 2. Rather than being exhaustive, the review in section 3 presents the models that we have found most instructive; we acknowledge that the selection is somewhat arbitrary and reflects our own tastes.[3] Also, not all issues discussed in section 2 have yet been the subject of formal models.

We conclude in section 4 with a comparison of the soft budget constraint phenomenon and other important issues of dynamic commitment in economic theory. We also discuss problems that remain to be clarified and research tasks ahead in the SBC research program.

The causes and consequences of the SBC phenomenon and policies for hardening the constraint form the subject of a rich and instructive body of empirical literature, to which we refer in several places. However, we attempt no comprehensive review of this literature here.[4]

2. *Clarification of Concepts: The SBC Syndrome*

The expression "soft budget constraint" is borrowed from the terminology of microeconomics.[5] Although its usage here is figurative, the phenomenon it describes is real and specific. The term *syndrome* customarily denotes a characteristic configuration of symptoms generated by particular circumstances. Thus, to describe the SBC syndrome involves reviewing both the symptoms and the circumstances.

Kornai first observed the SBC syndrome in the Hungarian economy of the 1970s, a socialist economy experimenting with the introduction of market reforms (Kornai 1979, 1980). Although state-owned enterprises were vested with a moral and financial interest in maximizing their profits, the chronic loss-makers among them were not allowed to fail. They were always bailed out with financial subsidies or other instruments. Firms could count on surviving even after chronic losses, and this expectation left its mark on their behavior. Since Kornai's first observations, the contention that softness of the budget constraint was a cause of inefficiency of socialist economies has gained wide acceptance. From the outset, analysis suggested that although the SBC phenomenon is especially pervasive in socialist economies, particularly those intent on "reform" (through heavier reliance on the market mechanism), it can also appear in other economic environments, even in those based entirely on private ownership (Kornai 1980, 1986). Let us begin with a stylized description of the syndrome.

[3] Several surveys of formal models have been produced (Maskin 1996; Dewatripont, Maskin, and Roland 2000; Erik Berglöf and Roland 1998; Maskin 1999; Maskin and Chenggang Xu 2001; Janet Mitchell 1998, 2000; Roland 2000).

[4] There are several reviews of the empirical literature on the SBC syndrome and on the efforts to harden the budget constraint in post-socialist transition countries (Simeon Djankov and Peter Murrell 2002; Kornai 2001; Mark Schaffer 1998; and World Bank 2002). Special mention should be made of the study by Djankov and Murrell, which applied meta-analysis techniques to 31 econometric studies. For a critique of the Djankov-Murrell approach, see Wendy Carlin et al. (2001), which summarizes questionnaire data from 3300 firms. The questionnaire specifically enquired into the effect of hardening budget constraints.

[5] Note that in much of standard microeconomic theory, only consumers, not producers, face budget constraints. But the assumption that producers are unconstrained is made merely for convenience, since most of this theory is not concerned with the relationship between finance and production, where such constraints come into play.

2.1 *BC-Organizations and S-Organizations*

An organization (e.g., a state-owned enterprise) has a budget constraint (call this a *BC-organization*): it must cover its expenditures out of its initial endowment and revenue. If it fails to do so and a deficit arises, it cannot survive without intervention. A constraint—on liquidity, solvency, or debt—sets the upper limit on the sustainability of the financial deficit. A BC-organization faces an HBC as long as it does not receive support from other organizations to cover its deficit and is obliged to reduce or cease its activity if the deficit persists.

The SBC phenomenon occurs if one or more *supporting organizations* (S-organizations) are ready to cover all or part of the deficit. In the case of state-owned enterprises, the supporting role is played by one or more state agencies. This pair of actors—a BC-organization in financial difficulty and a supporting S-organization—is found in every instance of the SBC phenomenon.[6] We treat the terms "support," "rescue" and "bailout" as synonymous actions to avert financial failure.

A great many kinds of "BC-organization–S-organization" pairs are found in practice.

(i) Most SBC research has dealt with the *corporate sphere*. The early literature examined nearly exclusively enterprises under *state* ownership, moreover under the socialist economy. However, it is not rare for firms in *private* ownership to be rescued from financial straits. This has been particularly evident in post-socialist transition where privatization has by no means ended the practice of bailouts. Indeed, a wide range of methods has been used to ensure the survival of firms that continued to make losses after passing into private hands. SBC phenomena have also arisen in many capitalist economies through such institutions as state subsidies to agriculture and assistance to "rustbelt" industries.

(ii) The SBC syndrome also clearly applies to banks and other *financial intermediaries* (although the term is not usual in the academic finance literature and the media). It is quite rare these days for a large bank in severe financial trouble to go out of business; normally, it is allowed to continue operating, perhaps after being acquired by another bank. The role of an S-organization here is played by the government or other financial institutions (Philippe Aghion, Patrick Bolton, and Steven Fries 1999; Berglöf and Roland 1998; Mitchell 1998, 2000; and Aaron Tornell 1999).[7] We return to the subject of bailing out banks and other financial institutions in section 3.5.

(iii) Bailouts are common among various *nonprofit organizations*, such as hospitals, schools, and universities that spend more than their revenues (on hospitals, see for instance Mark Duggan 2000). Particularly in transition economies, social-insurance institutions covering large numbers of people have not been permitted to go bankrupt. Instead, their deficits have been covered out of the state budget (Kornai and Karen Eggleston 2001).

(iv) Indebted or insolvent *local government authorities* (cities, municipalities, districts, etc.) frequently can rely on rescue by central government (Wim Moesen and Philippe van Cauwenberge 2000; D. E. Wildasin 1997).

(v) The SBC syndrome often appears at an international level. *National economies* that have become insolvent and face financial crisis apply for rescue and usually obtain

[6] The long-term relationship between an individual on welfare and the agency that dispenses payments may appear to fall under this description. But conventional usage of the term "SBC syndrome" is limited to the case where both parties in the relationship are *organizations*.

[7] Notorious examples of financial SBCs in the United States have included the state bailouts of the saving and loan associations in the 1980s and 1990s and the privately financed rescue of the Long Term Capital Management investment corporation.

assistance from international financial agencies or the international financial community (Stanley Fischer 1999).

2.2 *The Motives*

The motives of the BC-organization asking for rescue and support do not require much explanation; they are self-evident in the case of profit-motivated organizations. Of course, the list above includes many organizations that do not have a profit motive. But in those cases, a survival motive will often work just as effectively. Indeed, it is a well-known principle from social psychology that the leaders of an organization come to see the work of their institution as essential. Furthermore, their positions typically provide them not only with a financial livelihood, but with privileges, prestige, and power. Hence, the heads of most organizations can be expected to fight tenaciously for their survival.

The motives of the S-organization, by contrast, are often less transparent. Much of the literature on the SBC concentrates precisely on this issue. There is no single, universal motivation. Here we offer a classification of a multiplicity of possibilities.

The first classification criterion is whether the S-organization undertakes the act of rescue voluntarily or by necessity. How can rescue be forced on an S-organization? Imagine that a BC-organization can survive if it fails to pay taxes, does not repay its bank loans, or neglects its suppliers' bills. In those instances, of course, the BC-organization has breached its constraints and failed to fulfill its legal obligations. Suppose, however, that the means of enforcing the tax obligation or the private contract are prohibitively costly to the tax authority, bank, or supplier. Then the S-organization has little option but to tolerate the noncompliance, at least temporarily. Thus, the ability to enforce tax obligations and private contracts may be an essential condition for hardening budget constraints.[8]

In other cases, however, the tax authority may deliberately overlook mounting tax arrears or the bank may willingly tolerate nonperforming debt, because it actually wishes to assist the BC-organization. What might motivate such voluntary acts on the part of the S-organization?

Let us consider first the most thoroughly studied case, that of a state-owned enterprise in a socialist economy (as Hungary, Poland, or Yugoslavia used to be) in which market-oriented reforms are taking place (implying, in particular, that an enterprise's profit is a meaningful concept). On the one hand, the government wishes the enterprise to earn a profit, because this enhances efficiency and provides a source of revenue. On the other hand, the government is concerned that allowing a loss-making enterprise to fail will cause many workers to become redundant, thereby contributing to social unrest and political tension. This inconsistency in objectives can induce the government to act schizophrenically and issue conflicting orders. Often a division of labor develops, in which one state agency acts tough—demanding that the enterprise be profitable—while another stands ready to come to the rescue should the enterprise falter. In other cases, inconsistent behavior occurs sequentially: first, threats and promises of severity, and then, bailouts.

We have mentioned fear of unemployment and political unrest as motives for softness. There are, however, many other possible motivations. Here are some of the most typical:

[8] The experience of post-socialist transition confirms that establishing the requisite legal infrastructure is important for hardening the budget constraint. The EBRD has devised several indices to measure progress in legal transformation, including enactment and enforcement of commercial, financial, and bankruptcy legislation in conformity with a market economy. It is also attempting to measure the extensiveness and effectiveness of these measures. (See EBRD *Transition Reports* 1998 and 1999.)

1. The S-organization (e.g., a bank or an investor) may be induced by its *own best business interests* to extend more credit or invest more capital in a troubled BC-organization. It is led to do so because of previous investments or loans that it would lose were operations to discontinue.

The idea of investing in an enterprise in order to recoup past investment is central to Dewatripont and Maskin (1995) and a succession of related models that are reviewed in section 3. This motivation for bailouts merits special attention because there is a sense in which it is the most logically parsimonious explanation for the SBC syndrome: it requires no appeal to outside economic and political factors or to corrupt influence. Partly for that reason, it has played an especially important role in the theoretical SBC literature. Indeed, we argue below that it can readily be modified to incorporate motivations other than business interests.

2. *Paternalism* may motivate the S-organization to bail out an ailing enterprise. Particularly if the enterprise is owned by the state, state officials may feel protective and responsible for it. In his early writings on the SBC syndrome (e.g., Kornai 1980), Kornai gave particular prominence to this motive. The very first model we discuss in section 3.1 assumes a paternalist motivation.

A similar mentality can be found in large corporate organizations consisting of many business units (big American conglomerates, Japanese *keiretsu* and *zaibatsu*, and Korean *jaebol* organizations). If one of the separate accounting units makes a loss, earnings from the profitable units are often reallocated to help out the loss-makers. That is, cross-subsidization serves as insurance against failure. Other motivations than paternalism, however, may be at work here as well.

3. Politicians such as parliamentary representatives may be *politically* motivated to obtain subsidies for firms in financial difficulty (Andrei Shleifer and Robert Vishny 1994). They strive to save jobs so as to increase their popularity and political influence, and improve their chances of reelection. This motive overlaps to some extent with motives 2, 5, and 6.[9] A model discussing this motive is presented in section 3.6.1, but the model of section 3.1 can be reinterpreted in the spirit of a political motivation.

4. When there is multi-level hierarchical control, leaders may have *reputational* incentives to prevent financial failure. In particular, a spectacular collapse on the part of a lower-level unit might suggest that those higher up had failed to exercise proper control. Rescuing the troubled unit would help avoid the charge of managerial laxity (Chong-en Bai and Yijiang Wang 1996).[10]

5. Sometimes rescuing a *BC*-organization represents an effort by an S-organization to avoid *economic spillover effects*. If a big enterprise goes under, its unpaid bills may force its suppliers down too, starting a chain reaction of bankruptcies. These failures could cause mass redundancies and a fall in aggregate demand, possibly leading to recession. This motivation for rescue is sometimes captured by the phrase, "Too big to fail." A model along those lines is discussed in section 3.4.1. This motivation seems particularly important for the case of banks and other financial institutions on the brink of insolvency. Indeed, there have been occasions in economic history, including the great depression of the 1930s, when spectacular bank failures seem to have been instrumental in precipitating panic and recessions. The financial collapse of social insurance institutions can also have grave economic consequences.

6. Finally, there may be *corrupt influences* at work in the S-organization: "crony"

[9] Andrei Shleifer and Daniel Treisman (2000) show that a major source of soft financing often consists of tax concessions offered by local government. This points to the particular influence of local politicians.

[10] Motives 2, 3, and 4 presume that the S-organization is hierarchically *superior* to the supported BC-organization. The other motives do not entail any particular hierarchical relationship.

relationships with the organization to be rescued, or plain bribery. The model in section 3.6.1 analyzes this motive.

Notice that we do not include insurance companies among S-organizations. In a commercial insurance transaction, the client *buys* a "service" (through paying a premium) in which the insurer agrees to provide compensation in case of loss. But a BC-organization in an SBC relationship does not purchase rescue from the S-organization.[11] Indeed, the crux of the SBC problem is precisely that an S-organization would *not* wish to commit itself contractually to provide support; its incentive to bail the BC-organization out arises only ex post.

An important remaining task for research is to delve a layer deeper into the causal analysis. What structural factors engender the motivations of an S-organization? What effect does the social, economic, and political environment have, and within that environment, what softening or hardening effect on the budget constraint does the institutional framework surrounding S-and BC-organizations exert? To what extent is this effect systemic? In other words, how far is the hardness or softness of the budget constraint affected by whether the S-and BC-organizations operate under a classic, pre-reform socialist system, amidst experiments with reforming the socialist system, under conditions of post-socialist transition, or in a traditional market economy that has never undergone a socialist phase?

Several important aspects of this broad set of questions have been addressed extensively in the empirical literature on post-socialist transition. There the focus has been primarily on the effect of property relations. Specifically, researchers have asked: Is a state-owned enterprise more likely to count on a bailout than a private firm? Does a privatized firm have better chances of state rescue than a *de novo* private firm? Do privatization and bolstering the private sector reinforce the trend toward hardening the budget constraint? Affirmative answers to these questions come from a succession of studies: Gilles Alfandari, Qimiao Fan, and Lev Freinkman (1996); EBRD (2000); James Anderson, Georges Korsun, and Murrell (2000); Roman Frydman et al. (2000); and Schaffer (1998). It is also shown that demonopolization helps harden the budget constraint (Lubomir Lizal, Miroslav Singer, and Jan Svejnar 2001).

Unfortunately, the empirical measures of hardness and softness vary considerably from study to study and are sometimes quite rough. Furthermore, they are typically not closely grounded in theory, which is why, since theory is our main concern here, they are not dealt with in detail in this article.

2.3 *Temporal Nature of SBC Syndrome and the Ex Ante/Ex Post Distinction*

We have used the terms "support" and "rescue" thus far without specifying any temporal context. A rescue in everyday language is a *single act*, e.g., throwing a life belt to a drowning man. Of course, many economic events are of that nature: a previously viable organization finds itself in grave financial trouble and is kept alive by a single intervention. A crucial feature of the SBC syndrome, however, is that its rescues are not completely unexpected, nor are they necessarily limited to once-off interventions. They include *prolonged* support of organizations suffering from persistent financial problems. Indeed, once the problems arise, the likelihood of continued support is well understood by all parties concerned, as in the case of a critically ill patient, hooked up to life-support machines and breathing

[11] Of course, there may be cases where a BC-organization seems to "buy" rescue by bribing the appropriate agent of the S-organization. But this is clearly not an insurance transaction. The bribe cannot be viewed as a premium; it typically will fall far short of compensating the S-organization for the cost of the rescue effort (in any case, it typically goes straight into the bribed official's pocket rather than into the S-organization's coffers).

apparatus.[12] In view of the extraordinary costs of such long-term interventions, one might well ask how an S-organization could get itself into the position of making them. We will argue that an important potential explanation for such SBCs (and for SBCs in general) is the inability of the S-organization to make dynamic commitments.

In rough outline, the story goes as follows. Initially, when a BC-enterprise is first set up and funded, the prospects for success look good. Moreover, to provide the incentive for hard work—which would increase the probability of success—the S-organization may declare that it will refuse to bail out the enterprise should financial difficulties later arise. But later if the enterprise *does* get into trouble, the S-organization has no way to enforce that declaration. Furthermore, although the expense entailed in repeated bailouts may be high, the cost of economic and social disruption ensuing from the enterprise's collapse could well be even higher. And so *ex post* there may be an irresistible force for making the bailouts. Indeed, if the potential disruption from collapse is big enough, both parties will anticipate a continuing sequence of bailouts.

Naturally, the S-organization would never have wished to see the enterprise set up in the first place had it known that this trouble would occur. Still, nearly every investment involves some downside risk, and so the problem cannot really be blamed on faulty forecasting. Rather, the problem lies with the S-organization's ineffective *ex ante* promise not to make the bailouts. Had the enterprise expected that this promise would be kept, it would have been motivated to reduce the chance of failure. It is this lost motivation—and, most important, the higher prospect of failure that comes with it—that is the real tragedy of the SBC syndrome.

To summarize: in this story, the ex ante and ex post perspectives of the S-organization are radically different. Ex ante, it would wish to refrain from rescuing firms in order to keep the risk of failure low; but ex post, once a failure has occurred, it has strong reasons to undertake a bailout and to put the firm on life support.

We will argue in section 3 that a large part of SBC-related phenomena can be understood in terms of this ex ante/ex post distinction, broadly construed. We must emphasize, however, that this distinction is not the only way that has been proposed for understanding the SBC phenomenon. For example, Shleifer and Vishny (1994) and Maxim Boycko, Shleifer, and Vishny (1996) offer an important alternative theory in which the ex ante/ex post distinction is absent. A number of other alternatives are described in section 3 below.

2.4 *Means of Softening*

The means of rescue and of sustenance fall into three main groups. The first consists of *fiscal means*, in the form of subsidies from the state budget or of tax concessions (remission, reduction, or postponement of tax obligations).

The empirical literature on post-socialist transition deals extensively with fiscal means of softening the budget constraint. The forms of fiscal softening differ from country to country and period to period. There are places where the open-subsidy system has survived for years, such as Kazakhstan (Simeon Djankov and Tatiana Nenova 2000) and Lithuania (D. A. Grigorian 2000). Elsewhere, the use of this instrument has been curbed and tax concessions granted instead, e.g., in Russia (Alfandari, Fan, and Freinkman 1996; David Brown and John

[12] Djankov (1999) presents a graphic example of how firms were kept alive artificially in Romania. State-owned enterprises in grave financial difficulty were given protection under a so-called "isolation programme," which, to get them ready for reorganization and privatization, shielded them from the uncertainties of insolvency proceedings. The program backfired because all it did was to maintain the SBC syndrome in this group of enterprises.

Earle 2000; and Shleifer and Treisman 2000). In many places, a major instrument of softening has been tolerance of tax arrears, e.g., in Bulgaria (Stijn Claessens and R. Kyle Peters 1997), Romania (Fabrizio Coricelli and Djankov 2000), and several other post-socialist countries (Schaffer 1998).

The second group of softening instruments involves some form of *credit*. For example, loans may be offered to financially troubled firms that would not be eligible for credit were standard conservative lending criteria applied. Alternatively, firms that have already borrowed may have the servicing and repayment terms in their loan contracts relaxed. Of course, credit *per se* is consistent with an HBC. But under the SBC syndrome *too much* credit is extended from the standpoint of economic efficiency (see section 3.3.3 for a discussion of credit softening).

A number of empirical surveys confirm that this second group of instruments has become the main means of softening the budget constraint in several countries. In particular, state-owned banks tend to give preference to distressed enterprises when allocating credit, and tolerate late or even omitted repayments; see studies on China (Robert Cull and Lixin Xu 2000; and Shumei Gao and Mark Schaffer 1998), on Romania (Coricelli and Djankov 2001) and on a collection of post-socialist countries (Claessens and Djankov 1998; and Schaffer 1998.)

Trade credit is normal practice in both HBC and SBC settings: buyers are often not expected to pay sellers straightaway. In the SBC world, however, a buyer can often get away with postponing payment beyond the agreed-upon deadline.

There are several empirical studies dealing with this phenomenon as well. Brian Pinto, Vladimir Drebentsov, and Alexander Morozov (2000), calling Russia in the 1990s a 'non-payment' economy, argue that late payment was one of the main causes of that country's economic woes. The dividing line between an acceptable level of trade credit and a SBC situation is debatable (Schaffer 1998). However, experience convincingly exhibits the benefits that accrue when firms start demanding payment vigorously from their customers; see the studies on Bulgaria (Claessens and Peters 1997), Hungary (Schaffer 1998), Russia (Christian de Boissieu, Daniel Cohen, and Gael de Pontbriand 1995), and Vietnam (John McMillan and Christopher Woodruff 1999).

A third group of instruments consists of various *indirect* methods of support. For instance, the state may rescue a firm suffering from sales difficulties by imposing administrative restrictions on imports or erecting a deterrent tariff barrier to ease pressure from foreign competitors.

Actions that soften the budget constraint are often observable events, whose frequency and relative weight in financial affairs can be measured. Some indicators of softness are published in standard economic statistics. Observing and measuring other indicators is more complex and calls for special data collection. (See indicators 1– 4, forming the first block in table 1.)

Softening can often be disguised by being undertaken in parallel with measures that appear to go the other way. For instance, a government may sharply reduce the subsidies recorded in the state budget—such a change is obvious and welcome to the IMF and international observers—but concurrently relax discipline in tax collection, and, in this way, provide financial support for loss-making firms. Similarly, when fiscal means of softening are restricted, credit methods may come to the fore, say, in the form of soft loans (John Bonin and Schaffer 1995; Kornai 2001). Such phenomena have occurred repeatedly during the post-socialist transition (Schaffer 1998), hence the need for caution when measuring the strength of the SBC syndrome via the means of softening. Simply observing one or two

TABLE 1
INDICATORS OF SOFTNESS/HARDNESS OF BUDGET CONSTRAINT OF THE FIRM

Phenomena represented by the measurement	Studies applying the measurement
Instruments of softening	
1. Subsidies or other contributions of the state	
a. percentage of GDP or total budget	EBRD (1998) Gao and Schaffer (1998) Raiser (1994, 1996)
b. percentage of firms reporting subsidies	Earle and Estrin (1998) EBRD (2000)
2. Soft taxation	
a. tax arrears as a percentage of GDP or total budget	Djankov and Kreacic (1998) EBRD (1998) Frydman, Gray, Hessel, Rapaczynski (2000) Pinto, Drebentsov, and Morozov (2000) Schaffer (1998) Sjöberg and Gang (1996)
b. percentage of firms reporting tax arrears	EBRD (2000)
c. survey: perception of the phenomenon	Tóth (1998)
3. Soft bank credit	
a. preference for distressed firms in credit allocation	Brana, Maurel, and Sgard (1999) Budina, Garretsen, and de Jong (2000) Gao and Schaffer (1998) Schaffer (1998)
b. "bad" loans (e.g. as a percentage of total outstanding loans)	Bonin and Schaffer (1995) EBRD (1998, 1999) Gao and Schaffer (1998)
c. arrears of repayment of loans (e.g. as a percentage of total outstanding loans or bank credit and bank arrear correlation)	Cull and Xu (2000) Dobrinsky (1994) Frydman, Gray, Hessel, Rapaczynski (2000) Gao and Schaffer (1998) Perotti and Carare (1997)
d. unusual debt/equity ratio or debt/asset ratio	Budina, Garretsen, and de Jong (2000) Majumdar (1998) Gao and Schaffer (1998)
e. unusual cash-flow/debt ratio	Pohl, Anderson, Claessens, Djankov (1997)
f. survey: subjective assessment	Tóth (1998)
4. Excess trade-credit	
a. overdue trade credit as a percentage of GDP or total capital	Bonin and Schaffer (1995) EBRD (1998) Frydman, Gray, Hessel, Rapaczynski (2000) Sjöberg and Gang (1996) Pinto, Drebentsov, and Morozov (2000) Schaffer (1998)
b. survey: subjective assessment	Tóth (1998)

TABLE 1 *(cont.)*

Expectation of rescue	
5. Survey data about subjective probabilities concerning the expectation of rescue	Anderson, Korsun, and Murrell (2000)
Characteristics of the exit process	
6. Survival of organizations in financial trouble (chronic deficit, insolvency, accelerating growth of indebtness) (e.g. loss-makers as a percentage of all firms)	Claessens and Peters (1997) EBRD (1998) Gao and Schaffer (1998) Li and Liang (1998)
7. Frequency of bankruptcies and liquidations, filed and executed (e.g. as percentage of total number of firms)	Bonin and Schaffer (1995) EBRD (1998) Mitchell (1998)
8. Frequency of bail-outs	Li and Liang (1998)

Note: The table refers only to subsidies that use in an explicit form the language of the SBC theory, and apply the indicators mentioned in the left column for measuring the softness/hardness of the budget constraint.

such measures can generate potentially misleading conclusions.[13]

2.5 *Expectations and the SBC Mentality*

If a bailout is entirely unanticipated, there is little point in ascribing the event to an SBC. We normally say that the syndrome is truly at work only if organizations can *expect* to be rescued from trouble, and those expectations in turn affect their behavior. Such expectations have much to do with collective experience. The more frequently financial problems elicit support in some part of the economy, the more organizations in that part of the economy will count on getting support themselves.[14]

From time to time, S-organizations may announce that henceforth they will break with past practice and refrain from making bailouts. But, of course, such announcements normally have little effect unless combined with some institutional change that lends credibility to the promises. If BC-organizations can see that an S-organization has done nothing to modify its *vested interest* in lending support, they will simply ignore such vows.

Naturally, it is not possible to observe expectations and perceptions directly, but an appropriate questionnaire may garner useful information about these. For instance, the head of a BC-organization could be asked

[13] Unfortunately, this is done in several otherwise instructive empirical surveys. Carlin et al. (2001), for instance, proxy the SBC-phenomenon with a synthetic indicator generated by variables reflecting tax arrears and overdue payments to utilities. A similarly lopsided proxy is used to describe the SBC-effect in John Earle and Saul Estrin (1998), EBRD (1999), and World Bank (2002). This practice may lead to false conclusions and produce a biased view of the SBC-phenomenon.

[14] David Li and Minsong Liang (1998), using a sample of several hundred Chinese state-owned enterprises in the 1980–94 period, demonstrated that dismissing surplus labor would have cut losses by almost 40 percent. Yet no such dismissals took place. This suggests that managers were convinced that their firms would be kept alive despite their big losses, which provides indirect confirmation that the SBC is incorporated in their expectations.

what sort of financial trouble would force it to cease trading, or what chance they would see of a rescue. This approach is taken by Anderson, Korsun, and Murrell (2000).

To summarize, the SBC *mentality* is a basic feature of the SBC syndrome. The syndrome embraces not just a characteristic sequence of events and financial transactions, but the perceptions of organization managers that give rise to those events.

2.6 *Primary Consequences: Survival and Exit*

The SBC syndrome exerts considerable influence over the life and death of organizations and thus over economic natural selection. Let us ignore categories (iv) and (v) from subsection 2.1: financial difficulties do not normally lead municipalities, towns, and districts, let alone countries, to exit. Within categories (i)–(iii), however, exit is a normal event. If an organization, particularly one in category (i) or (ii), makes persistent losses, an HBC environment will not permit its survival.

A key measure of the SBC syndrome is the degree to which organizations are permitted to fail. As a first approximation, one can examine the overall frequency of bankruptcies and liquidations. More accurate conclusions can be drawn by limiting the exit proportion calculations to the organizations in serious financial difficulty—those likely to exit under an HBC (for these measurement possibilities, see indicators 6–8 in the third block in table 1).

The SBC idea complements Schumpeter's (1911) theory of *creative destruction*. Schumpeter's main concern was to explain the *birth* of organizations, and the role played by entrepreneurs in generating entry; he tacitly assumed that the market takes care of *death*. Indeed, even in good times, most market economies experience a significant rate of exit. Theories of the SBC syndrome, such as the models surveyed in section 3, help illuminate the role of the S-organizations in producing deviations from normal exit rates, by weakening or even eliminating the "destructive" aspect of the Schumpeterian process.

2.7 *Behavioral Effects of the Syndrome*

When BC-organizations anticipate being rescued should they get into trouble, their behavior is usually distorted, as we will see in the models of section 3. Let us examine some characteristic distortions.

1. Perhaps the most important is the attenuation of managerial effort to maximize profits, or, when there is no profit motive, to reduce costs. There is also a weakening of the drive to innovate and develop new technologies and products. Finally, rather than wooing customers, sellers concentrate more on winning the favor of potential S-organizations, i.e., on rent seeking (A. Krueger 1974). All these effects reduce the efficiency of organizations affected by the SBC.

Several papers examine how the softness or hardness of its budget constraint affects the performance of a firm. Most of the empirical pieces focus on post-socialist transition. Specifically, they look at the consequences of hardening (or not hardening) particular budget constraints.

The theoretical models in section 3 suggest that, other things being equal, hardening budget constraints will promote restructuring, raise total factor productivity, and encourage the shedding of surplus labor. Maintaining or enhancing softness of budget constraints will have the opposite effect. This hypothesis is supported by empirical research on Bulgaria (Simeon Djankov and Bernard Hoekman 2000; and Claessens and Peters 1997), China (Cull and Xu 2000; and Li and Liang 1998), Russia (Pinto, Debrentzov, and Mozorov 2000; and de Boissieu, Cohen, and de Pontbriand 1995), Romania (Wafa Abdelati and Claessens 1996; and Coricelli and Djankov 2001), seven Central and Eastern European countries (Claessens and Djankov 1998), and 25

transition countries (Carlin et al. 2001).

From a combined examination of 31 empirical studies, Djankov and Murrell (2002) draw the following common conclusion: 'The evidence is consistent with the view that hardened budget constraints have had a beneficial effect on enterprise restructuring in East Europe and the CIS.[15]

2. The SBC syndrome dulls the price responsiveness of BC-organizations and thereby the effect of price signals. There is less need to attend to relative prices on the output and input sides if the difference between revenue and expenditure is no longer critical.

3. BC-organizations' ability to buy inputs without footing the bill—costs are borne by S-organizations—can dramatically augment their demand for these inputs. This in turn can lead to serious shortages.[16] The SBC syndrome may also give an inordinate boost to the propensity to invest by reducing the risk to the investor, who can anticipate assistance from the S-organization should the investment turn out poorly. Both phenomena—runaway demand and overinvestment in risky ventures—may lead to excessive economic expansion.[17] It is precisely these effects on demand that are one of the fundamental explanations for why socialist economies were characterized by generalized shortages. These shortages in turn affected the behavior of agents at all levels in the economy (see the general theory developed in Kornai 1980).

To sum up, the SBC syndrome is a complex phenomenon that substantially alters the selection processes operating in society and the economy, compared with their operation in a market framework. It is driven by a characteristic set of motives, works through a characteristic set of means, and has characteristic effects on the expectations and behavior of actors. All these features are empirically observable and measurable; that is, the extent to which an economy or subeconomy is subject to the SBC syndrome is a question that is in principle answerable.

We should point out that our characterization of the SBC-concept is notably broader than that found in any given paper on the subject. For example, authors typically focus on a particular sort of BC-S pair (e.g., a firm and a bank) without considering other possibilities. Similarly, they tend to concentrate on just one or two of the possible motives for rescue.

Thus, for example, Kornai (1980) emphasizes motive 2, paternalism, under socialist conditions. Dewatripont and Maskin (1995) assume that the S-organization has motive 1, best business interest, for undertaking the bailout. The motives for Shleifer and Vishny (1994) are political power and corruption; in other words the operation of motives 3 and 6 is assumed. Bai and Wang (1996) emphasize motive 4, the enhancement of reputation. S. M. Goldfeld and R. E. Quandt (1988) see the BC-organization's efforts to obtain a rescue as a critical component of the SBC syndrome.

We believe that the depiction of the SBC syndrome given here is consistent with all these views, as well as with the conceptual analyses of Djankov and Murrell (2002), Li and Liang (1998), and Schaffer (1998).

[15] Several researchers point out that hardening the budget constraint leads to a sustained increase in performance provided that it is coupled with other institutional changes, above all expansion of the private sector, stronger competition and legal security (Djankov and Hoekman 2000; Frydman et al. 2000; Roman Frydman, Marek Hessel, and Andrzej Rapaczynski 2000; and Clifford Zinnes, Yair Eliat, and Jeffrey Sachs 2001).

[16] Kornai (1992, chaps. 11 and 12) identifies several factors explaining the chronic shortage prevalent under the socialist system, giving a pivotal role to softness of the BC in the causal analysis.

[17] On the occasion of the Asian crisis of 1997–98, Paul Krugman (1998) writes that "over guaranteed and underregulated intermediaries can lead to excessive investment by the economy as a whole." He offers a simple model of the effect of implicit guarantees to financial intermediaries, but does not set these ideas within the framework of the SBC syndrome. Going further, Haizhou Huang and Chenggang Xu (1999) argue that this crisis can indeed be traced to such a syndrome.

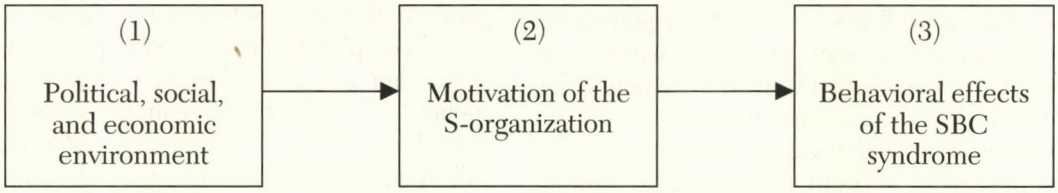


Figure 1. SBC Syndrome: The Chain of Causality

3. *Theories of the SBC Syndrome*

Before beginning our theoretical review, we must make several preliminary remarks. First we must stress that no existing model is rich enough to capture all the characteristic features delineated in section 2. In this sense, there does not exist a formal model that can be designated *the* theory of the SBC. The use of the plural, rather than the singular in the section title is meant to emphasize this.

Understanding the SBC syndrome entails bearing in mind a complex chain of causality, which has been depicted in a schematic form in figure 1. Block (1) represents the political, social, and economic environment that generates the motives behind the formation of the SBC syndrome, for instance the classical, pre-reform socialist system, or the post-socialist transition, or some variant of the capitalist system. Block (2) represents the motives that create the SBC syndrome. Finally, block (3) represents the effects that the SBC syndrome brings about. All three blocks were discussed in section 2.

The formal theories below focus on blocks (2) and (3), and the effects of block (2) on block (3). The linkage (1)→(2) is usually touched on in these works, but not always with a detailed analysis. Some modelers have been inspired by a particular political-social-economic formation under block (1), such as reform experiments within socialism or the post-socialist transition. In most cases, they have framed their papers and placed their models in this environment. Our survey follows this approach. We make no attempt to extend the models by generalizing them beyond the particular environments in which they are set. In section 4 we return to the interaction (1)→(2) when discussing the remaining research agenda.

There is a fair amount of work that simply posits the existence of the SBC syndrome and concentrates on the effect (2)→(3). These papers do not address the question of why the budget constraint is soft. Rather they clarify how the softness of the budget constraint—exogenously given—influences the working of the economy, e.g., how it modifies the form of the demand function (e.g., János Kornai and Jorgen Weibull 1983; Goldfeld and Quandt 1988, 1990, 1993; Karen Magee and Richard Quandt 1994, etc.). We think this approach has been useful, but do not deal with it in section 3.

3.1 *SBC as a Dynamic Commitment Problem*

As suggested in section 2, an important potential explanation for SBCs is the inability of the S-organization to commit itself not to extend further credit to a BC-organization after providing initial financing. The S-organization would like to induce the BC-organization to work hard to avoid making a loss. So it declares that it will refrain from making bailouts. Once a loss occurs, however, it fails to abide by this declaration.

The first formal model to make the link between SBCs and dynamic commitment was that of Schaffer (1989). The model

works as follows.[18] A BC-organization (enterprise) manager can choose whether or not to expend costly effort. If he expends the effort, then output (which accrues to the S-organization, which we will call the "center") is high. If he refrains from doing so, output is zero unless the center bails the enterprise out (in which case, output is again high). To induce effort (which is not directly observable), the center can offer the manager a bonus if output is high. But if the center's net profit from the output is positive even after it pays for the bailout and the manager's bonus, then the manager will choose not to expend effort. This is because, by refraining, he will induce the center to undertake the bailout (since a positive payoff is better than nothing), and thus can collect the bonus at no cost to himself.

This outcome can be viewed as a failure of commitment. If the center could somehow tie its hands and commit itself not to undertake a bailout, it would fare better: the manager would now choose to exert effort in order to collect the bonus, and the center would therefore enjoy high output without a costly bailout. But notice that the center cannot simply announce in advance that there will be no bailout. Such an announcement would not be believed, since the manager knows that the center prefers a positive to a zero payoff. To induce the manager to expend effort, therefore, the manager must do something at the outset to make bailouts impossible or at least prohibitively costly.

Although Schaffer (1989) connects SBCs to the issue of dynamic commitment, the paper leaves many questions unanswered. One obviously important question is why the center has to play this game at all. Since its intervention serves no useful purpose, one might ask why it cannot simply erect an insuperable bureaucratic barrier that prevents it from playing any economic role in the enterprise. Within the context of the model, this would completely solve the SBC problem.

Another major unaddressed issue is why socialist and transitional economies seem to have been more vulnerable to SBCs than full-fledged market economics. Put another way, why don't the S-organizations of capitalism bail out capitalist firms in the same way that the center in the Schaffer model does?

Dewatripont and Maskin (1995)—henceforth DM—and the literature that developed from it attempt to answer these questions. The simplest version of the DM model comprises two periods, a S-organization (center) that serves as a source of financing, and a set of BC-organizations or enterprises, each headed by a manager, that require funding to undertake projects. At the beginning of period 1 each enterprise manager selects a "project" and then decides whether or not to submit it for funding. Projects are of two possible types: good (with probability α) and poor (with probability $1-\alpha$). The type of project is known by the manager but not the center. Thus there is asymmetric information about the project when the manager decides whether or not to submit it.

When a project is submitted, the center must decide in period 1 whether or not to fund it. Set-up funding costs 1. If funded, a good project yields a verifiable gross monetary return $R_g(>0)$ and a private benefit $B_g(>0)$ for the enterprise (the private benefit might include such things as managerial perquisites and reputation enhancement) by the beginning of period 2. By contrast, a funded poor project yields a zero monetary return by the beginning of period 2. Faced with a poor project, the center could liquidate the enterprise's assets, in which case it obtains a liquidation value $R_L(\geq 0)$ and the enterprise gets a net private benefit $B_L(<0)$ (representing, say, the manager's loss of reputation after liquidation). The center alternatively could refinance the project by injecting additional capital of 1. In this case, the gross return is $R_p(>0)$ and the manager's

[18] Schaffer's model was developed to address a variety of issues. We present a simplified version that focuses only on the soft budget constraint.

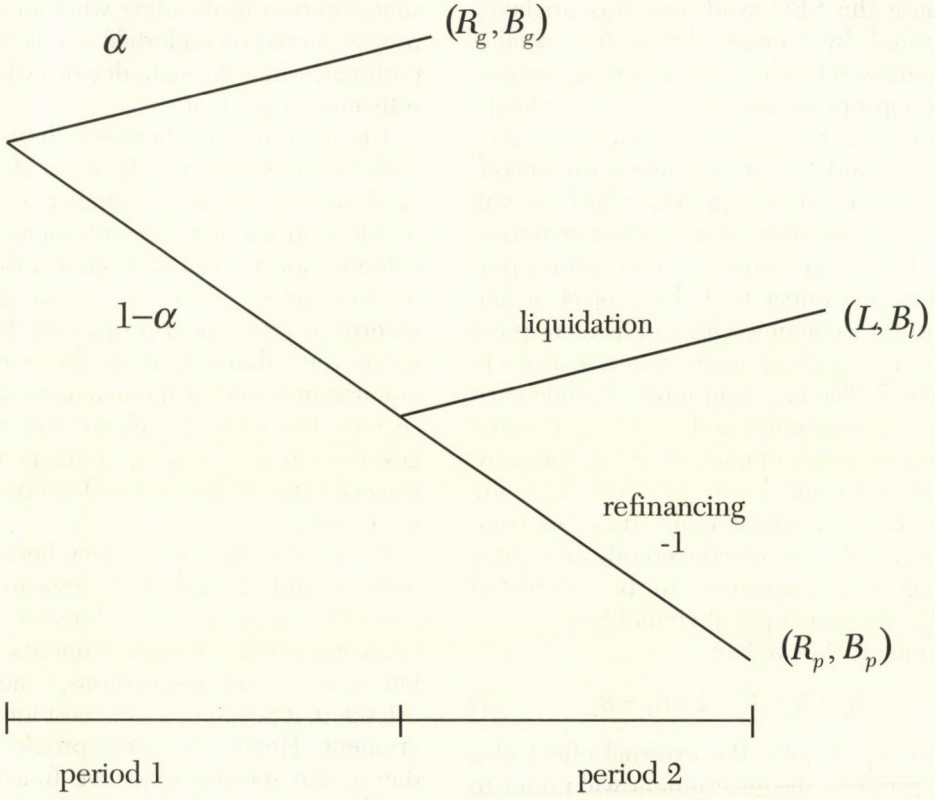


Figure 2. Structure of the Dewatripont-Maskin Model

benefit $B_p(>0)$ at the end of period 2. The decision to liquidate or refinance need not be a pure strategy; the center may choose to refinance with probability σ and to liquidate with probability $1-\sigma$. The timing and structure of the model are depicted in figure 2.

We will say that an enterprise with a poor project has a *hard* budget constraint if the center decides to liquidate it ($\sigma = 0$). The enterprise's budget constraint is *soft*, however, if the center opts for refinancing ($\sigma = 1$). More generally, when σ is strictly between 0 and 1, it measures the *degree* to which the budget constraint is soft.

The degree of softness in the enterprise's budget constraint will influence the manager's behavior, in particular his decision whether or not to submit a poor project. If we assume that all monetary returns go to the center (so that the manager's payoff equals his private benefit), then the manager will submit a poor project if and only if $\sigma B_p + (1-\sigma)B_L \geq 0$, i.e., as long as

$$\sigma \geq \frac{-B_L}{B_p - B_L} \equiv \underline{\sigma}.$$

Thus, there is a minimum degree of softness $\underline{\sigma}$ above which managers will submit poor projects. Notice that $\underline{\sigma}$ decreases with B_p and increases with $-B_L$.

Up to this point we have assumed nothing about the objectives of the S-organization and the conditions under which it will choose to finance projects ex ante and either liquidate or refinance poor projects ex post.

Because the SBC syndrome was originally identified by Kornai (1980) for socialist economies, let us begin by adopting assumptions appropriate for this case. Accordingly, assume that the S-organization is the government and that it maximizes *the overall social welfare* from a project, which we will take to be the project's net monetary return, plus the private benefit to enterprises, plus the external effect E of the project on the rest of the economy. This would correspond to the paternalistic motivation discussed in section 2. The last term might include such things as the political benefit of keeping project workers employed. Seen this way, the model could be interpreted along the lines of the political motivation discussed in section 6. As already noted, enterprise managers are assumed to be interested solely in their net private benefits.

Notice that if we have

$$R_p+B_p+E_p-1>R_L+B_L \qquad (1)$$

(where E_p denotes the external effect of a poor project), the government will prefer to refinance a poor project and so will take $\sigma = 1$. We should emphasize that if inequality (1) holds, it does not follow that the project is efficient nor that the state would have chosen to go ahead with financing ex ante had it known the project was poor. Indeed, a poor project is efficient only if its benefits (amounting to $R_p+B_p+E_p$) outweigh its costs (amounting to 2). And the project is inefficient if

$$1>R_p+B_p+E_p-1. \qquad (2)$$

Observe that if (1) and (2) both hold, the government will choose to refinance a poor project, even though that project is inefficient and would not have been financed in the first place had its type been known. The discrepancy arises because (2) represents an ex ante criterion; by contrast, (1) is an ex post criterion, one that arises after an investment of 1 has already been sunk in the project. Even though (ex ante) efficiency is the relevant criterion in deciding whether or not a project should be undertaken, it is no longer pertinent when the state decides whether to refinance or liquidate.

The inconsistency between these ex ante and ex post criteria is at the heart of the SBC syndrome viewed as a dynamic commitment problem. If the government could credibly commit not to bail out poor projects, it would improve efficiency—a manager of an enterprise with a poor project would refrain from even submitting it for financing, since liquidation would earn him a negative payoff ($B_p<0$). But without such commitment, the government will end up refinancing poor projects, and so they will indeed be submitted ex ante.

Notice that the discrepancy between criteria (1) and (2) boils down essentially to a project's *initial funding*. Specifically, this financing enters the government's ex ante but not ex post calculations, since, once extended, it becomes a sunk cost for the government. Hence, the SBC problem is not due to the socialist objective function that we have assumed for the government. Indeed, we will see below why SBCs are confined neither to socialist economies nor to government-firm relationships. Indeed, the interesting question in the end is not why we observe the SBC syndrome in socialist economies, but rather why such constraints are not more prevalent in capitalist economies. As we see in subsection 3.4.3, one possible answer is that, in capitalist economies, sources of funding (i.e., S-organizations) are typically dispersed and that, as a consequence, asymmetric information between sources interferes with bailouts.

We must stress the importance of ex ante uncertainty in this model. If the center could identify a poor project ex ante, it would decline to fund it. However, because *ex ante* it cannot distinguish between good and poor projects, it will either finance all projects or none of them. Projects will be financed if

$$\alpha(R_g+B_g+E_g-1)+(1-\alpha)(R_p+B_p+E_p-2)>0$$

i.e., if

$$\alpha > \frac{2-R_p-B_p-E_p}{R_g+B_g+E_g-R_p-B_p-E_p+1} \equiv \alpha^s.$$

Thus, if $R_L + B_L < 1$ and $\alpha > \alpha^s$, the only equilibrium of this model is one in which managers submit poor projects, all projects are funded, and all poor projects are refinanced ($\sigma = 1$), even though poor projects are ex ante inefficient. We call this a *soft budget constraint equilibrium.* Its opposite, a hard budget constraint equilibrium (which would prevail if inequality (1) were reversed) would entail that all poor projects be liquidated ex post. Thus they would not be submitted by managers ex ante.

From the standpoint of the DM model, "hardening" the budget constraint means creating conditions in which the government can credibly commit not to refinance an enterprise. Note that the hardness of the budget constraint is not a matter of *direct* policy choice, but rather the indirect result of putting institutions in place that discourage or interfere with refinancing.

As we indicated in section 2, the original analysis of soft budget constraints in Kornai (1980) was not mainly concerned with the causes of the SBC syndrome but rather with its consequences, especially the emergence of pervasive shortages. To the extent that it dwelt on causes, it concentrated particularly on political considerations, e.g., the desire of a "paternalistic" government to avoid socially and politically costly layoffs. Our above rendition of the DM model is entirely consistent with this point of view—as we have demonstrated, a paternalistic government (that maximizes "overall" welfare) in that model may indeed give rise to an SBC. Indeed, as we will see below, SBCs may be particularly likely when the S-organization is paternalistic. Logically, however, the model shows that paternalism is neither a necessary nor a sufficient condition for SBCs. The crux of the story is lack of dynamic commitment, which *could* arise with paternalism but also with many other possible motivations on the part of the center.

Note also that the model can be interpreted to include cases of repeated bailouts. This will indeed be the case if the first period is interpreted as the investment phase and the second period as the production phase with capital already sunk, as in the standard micro textbook case. Think, for example, of the case of a huge steel combinate like Nowa Huta in Poland in the 1970s or the Eurotunnel between France and Britain, where a huge investment is initially made. Once the capacity is in place, however, bad luck may make it impossible to recoup the initial investment. Ex post, production is better than nonproduction, but ex ante, the investment would not have been made had the subsequent bad luck been foreseen.

We now review some of the ways that the DM model in subsection 3.1 has been extended and adapted to shed light on a variety of SBC phenomena in socialist settings, transition economies, and competitive environments. We also analyze the special issue of soft budget constraints of banks. Finally, we examine other ways of formalizing the SBC syndrome.

3.2 *SBC in Socialist Economies*

3.2.1 *Shortage*

Kornai (1980) shows that the SBC syndrome—specifically, its effects on increasing enterprises' demand for inputs and decreasing their sensitivity to prices—plays an important role in explaining how shortages became so prevalent under socialism. Building on the model of subsection 3.1, Yingyi Qian (1994) shows why, despite enterprises' high demand, governments had a strong incentive to keep prices low and thereby aggravate shortages: such shortages helped mitigate the effects of SBCs, albeit in a very costly way.

Consider the model of subsection 3.1 but assume now that in period 2, enterprises with poor projects, if refinanced, use this

additional funding to purchase an input that is also in demand by consumers (the conclusions of the analysis would not be altered if enterprises with good projects also bought this input). Assume that this input is in inelastic supply $\bar{x}$. Without SBC and thus no refinancing of poor projects, consumers will pay a market-clearing price $p = v(\bar{x})$, where $v(\cdot)$ is the inverse demand function. When poor projects are refinanced, however, consumer demand can be crowded out. Assume that one unit of input is needed to complete a poor project. The market-clearing price will then be $p^* = v(\bar{x} - n(1 - \alpha))$, where n is the total number of projects (we are invoking the law of large numbers to express the number of poor projects as $n(1 - \alpha)$). Thus the cost of refinancing will be p^* which is larger than p. But, as long as $R_p + B_p + E_p - p^* > R_L + B_L$, the SBC syndrome will persist.

In this model SBCs impose a double burden on society: the usual loss from propping up an inefficient project plus higher prices for consumers. Qian shows, however, that placing a cap on the input price—thereby creating a shortage and the need for rationing (which Qian assumes is implemented probabilistically)—may serve to help mitigate these ill effects. Suppose that the cap is set so that, if refinancing is not sought for any other poor project, an enterprise with a poor project receives the input with probability q and does not receive it (i.e., the enterprise is rationed) with probability $1 - q$, in which case the project is liquidated. Then the expected payoff for the enterprise's manager is $qB_p + (1 - q)B_L$, which is negative for q sufficiently small. Hence for a sufficiently low price cap (implying a low q), the manager will be deterred from submitting a poor project, and the SBC will thus vanish. Of course, consumers too now face rationing—which itself is inefficient—but, for a large range of parameter values, this will be preferable to their being crowded out by inefficient projects. The model suggests why relaxing price controls as part of socialist reform experiments (as in Hungary and Yugoslavia) may actually worsen SBCs.

3.2.2 *Innovation*

The failure to innovate—to develop new technology at a sufficient pace—was a major reason for the ultimate collapse of central planning in the former Soviet Union and other socialist economies. Qian and Xu (1998) argue that this failure was directly related to the SBC syndrome. Because of soft budget constraints, centrally planned economies lack the capacity to screen out poor R&D projects ex post, i.e., after these projects' prospects are known (by contrast with market economies, which—for reasons we will discuss in later subsections—have harder budget constraints and therefore *can* screen ex post). Therefore, they have to rely on ex ante screening, which is less effective.

Following Qian and Xu (1998), we can formalize the argument as follows. Suppose, as before, that the center does not know at the outset whether an R&D project is good or poor. Assume, however, that perhaps by consulting experts, it can acquire a signal about the project's type (pre-screening). Prescreening is imperfect: it labels poor projects correctly but may mistakenly mislabel a good project as poor (to simplify the argument, we assume that only type II errors are possible). Nevertheless, if SBCs are a problem, the center may well avail itself of prescreening, which eliminates poor projects but also reduces the number of good projects, and hence induces a lower rate of innovation than in an economy with HBCs.

Prescreening of R&D projects—which was intensely employed in the former Soviet Union—will of course work better if the number of mislabeled good projects is low. This is more likely to be the case when prior technological knowledge is good (as was the case in the Soviet aerospace industry in the period 1950–80), and less likely when the relevant science is in its infancy (as was the case in the computer industry at that time).

Thus, the model predicts—and experience bears out—that the innovation "gap" between economies with soft and hard budget constraints should be greater for technologies where the corresponding science is newer.

3.2.3 *The Ratchet Effect*

The term "ratchet effect" was coined by Joseph Berliner (1952) in his analysis of management behavior in soviet-style firms. In such firms, managers were given what appeared to be strong incentives to fulfill their production plans. Indeed, they had inducements to *over-fulfill* the plans: each percentage point over the target was rewarded by additional bonuses. Nevertheless, managers tended to pass up the opportunity for these bonuses and instead were conservative in their plan overfulfillment, rarely exceeding 2 percent over target. Berliner's explanation for this conservatism was that managers feared that next year's target would be "ratcheted up"—made more demanding—if they exceeded this year's goal. By producing at 110 percent instead of 102 percent, their bonus would be higher today, but so would their target tomorrow. Models of the "ratchet effect" in Soviet planning include Martin Weitzman (1980); Michael Keren, Jeffrey Miller, and James Thornton (1983); James Bain et al. (1987); and Gérard Roland and Ariane Szafarz (1990).

Like the SBC syndrome, the ratchet effect is not confined to socialist economies. Other manifestations include a corporate division scrambling to spend money to prevent its budget from being cut, and workers on the assembly line slowing down their pace to forestall getting higher workloads tomorrow. Treatments of the ratchet effect as a more general dynamic commitment problem include Xavier Freixas, Roger Guesnerie, and Jean Tirole (1985); Jean-Jacques Laffont and Tirole (1988, 1993); and John Litwack (1993).

The ratchet effect and the SBC syndrome are clearly conceptually related. They also have the potential for reinforcing each other, since the need for bailing out "weaker" enterprises may increase the temptation to extract more resources from "stronger" enterprises. To see this in an extremely schematic way, let us follow Dewatripont and Roland (1997) and modify the model of section 3.1 so that good projects generate a return not only in the first period but, if refinanced, potentially in period 2 as well. Assume, however, that a manager with a good project must exert costly effort to realize his second-period return. Finally, suppose that second-period financing derives entirely from first-period returns and that the gross return from a poor project exceeds that from the second period of a good project. Then, poor projects will receive priority over good projects in second-period funding. This will not matter under a hard budget constraint because poor projects will not be financed in the first place. But it could matter under a soft budget constraint. Specifically, there may not be enough capital generated from first period returns to refinance all good projects (given that the poor ones have priority); it is as though the returns from good projects are taxed away. This in turn implies that managers may refrain from exerting effort because the prospect from refinancing is too low.

More formally, let $\hat{R}_g, \hat{E}_g, \hat{B}_g$ be the second period gross return, externality, and private benefit generated by a good project if the manager exerts effort (these are zero without effort). Assume that

$$\hat{R}_g + \hat{E}_g > 0 \tag{3}$$

and

$$\hat{B}_g < e\,, \tag{4}$$

where e is the manager's cost of exerting effort. Formulas (3) and (4) imply that the manager's exertions are socially desirable. Assume, however, that:

$$R_p + B_p + E_p > \hat{R}_g + \hat{B}_g + \hat{E}_g . \quad (5)$$

Formula (5) implies that, given a choice, the center will give higher priority to refinancing poor projects than refinancing good projects, and so good projects may be crowded out. Specifically, if there is an SBC, the gross return from the first period is αR_g per project (as opposed to R_g under an HBC). Hence, only $\alpha R_g - (1 - \alpha)$ is available for good projects (whereas there is ample capital to refinance all good projects under an HBC). Thus, if

$$\alpha < \frac{1}{R_g},$$

there is only a probability

$$\frac{\alpha R_g - (1-\alpha)}{\alpha} < 1$$

that a good project will be refinanced. If managers are risk neutral and

$$\left(\frac{\alpha R_g - (1-\alpha)}{\alpha}\right)\left(\hat{B}_g - B_g\right) < e ,$$

they will be discouraged from exerting effort. This sort of deleterious cross-subsidization—in which proceeds from good projects refinance poor projects, thereby attenuating the good projects' returns—is conceptually similar to the ratchet effect. It also proved to be an intractable problem for the former Soviet Union.

3.2.4 *Enterprise Autonomy*

A hallmark of the attempted reforms of socialism undertaken in Yugoslavia, Hungary, Poland, and Russia was greater enterprise autonomy. The rationale was that by delegating decision-making authority, the center would promote better decisions, since enterprise managers are likely to have the best information about local conditions. It became apparent in retrospect, however, that increased enterprise autonomy led to a softening of budget constraints.

Within the framework of the model presented in subsection 3.1, it is not difficult to see how this softening may have come about. Specifically, following Wang (1991), assume that the center monitors enterprises ex ante and can detect with probability p whether or not a project is poor. This means that a proportion $(1\text{-}p)(1\text{-}\alpha)$ of projects will be subject to bailout. Increased autonomy may well entail a more limited ability of the center to monitor and hence a reduction in p. But lower p means that more poor projects get refinanced, i.e., SBCs are more pronounced.

Still, we ought not conclude that weakening the center's ability to monitor unambiguously softens enterprises' budget constraints, as Olivier Debande and Guido Friebel (1995) emphasize. Suppose, for example, that a poor project's gross return R_p is *random*. Then only for those realizations of the project's return for which (1) holds will refinancing occur. Now, with greater enterprise autonomy, the center may no longer be able to discern the exact realization of R_p but only its mean. But although it is quite possible that (1) may hold for many realizations of R_p, it may well fail to hold for the mean—in which case SBCs will vanish.

3.3 *SBC in Transitional Economies*

A recurrent theme in discussions about transforming an economy from a socialist to a market mode of operation is the need to harden budget constraints of both enterprises and banks. Ironically, the transition experience suggests that soft budget constraints have persisted amongst the economies of Eastern Europe in the initial phases of transition, despite vigorous declarations on the need for hardening. Theory suggests particular institutional changes or reforms that might make hard budget constraints credible.

3.3.1 *Devolution*

Qian and Roland (1998) investigate devolution of government as a method for hardening budget constraints. The inspiration for this study was the Chinese experience. For obvious political reasons, privatization was

not an acceptable option in China at the beginning of the transition process. Nevertheless, there was a significant reorganization of government, in particular a decentralization of fiscal authority from Beijing to regional governments. Qian and Roland argue that competition among regional governments to attract foreign capital led to harder budget constraints.

As in the model of subsection 3.1, assume that there are enterprises—in this case, state-owned enterprises (SOEs)—that draw good projects with probability α and poor projects with probability $1 - \alpha$. There are also foreign firms, which make capital investments K_i in each region $i = 1,..., N$. Region i's output is given by $f(K_i, I_i)$, where I_i is public infrastructure in region i financed by government. The production function f satisfies standard assumptions:

$$\frac{\partial f}{\partial K_i} > 0 \qquad \frac{\partial f}{\partial I_i} > 0 \qquad \frac{\partial^2 f}{\partial K_i \partial I_i} > 0.$$

Government and foreign firms are, in effect, partners in a joint venture and divide output accordingly. Let β be the share accruing to government. Suppose that the total amount of foreign capital, K, is fixed.

Government's revenue comes from taxing the SOEs. Revenue is spent for three purposes: to bail out SOEs (in the case of SBCs), to invest in infrastructure, and to provide public goods. If these expenditures are all determined by the central government (and foreign firms choose their K_i 's as optimal responses to the I_i's), they will be chosen to maximize

$$\sum_{i=1}^{N} \beta f(K_i, I_i) + \left(R_p + B_p + E_p - R_L - B_L - 1\right) \sum_{i=1}^{N} y_i + \sum u(z_i) \quad (6)$$

such that

$$\sum_{i=1}^{N} K_i = K \quad (7)$$

$$\frac{\partial f}{\partial K_i}(K_i, I_i) = \frac{\partial f}{\partial K_j}(K_j, I_j) \text{ for all } i, j \quad (8)$$

and

$$\sum I_i + \sum y_i + \sum z_i \leq \sum T_i, \quad (9)$$

where, for all i, y_i is expenditure on bailing out SOEs in region i, z_i is expenditure on public goods in region i, and T_i is tax revenue available form SOEs in region i (in this program, we treat the K_i's as if they are choice variables for the government because we also impose (7) and (8), which ensure that, at the optimum, the K_i's will have the same values as though chosen by the foreign firms). Observe that there will be SBCs (i.e., $y_i > 0$) provided that, in the solution to this program, we have

$$R_p + B_p + E_p - R_L - B_L - 1 > \beta \frac{\partial f}{\partial I_i}(K_i, I_i) = u'(z_i), \quad (10)$$

i.e., if the marginal benefit from refinancing poor projects, $R_p + B_p + E_p - R_L - B_L - 1$, exceeds that from investing in infrastructure, $\beta \frac{\partial f}{\partial I_i}(K_i, I_i)$, which, at the optimum, must equal the marginal benefit from public goods $u'(z_i)$.

If, however, the expenditure decisions are devolved to the regional government, then, for all $i = 1,..., N$, the optimization problem becomes that of maximizing

$$\beta f(K_i(I_i), I_i) + (R_p + B_p - R_L - B_L - 1) y_i + u(z_i) \quad (11)$$

such that

$$I_i + y_i + z_i \leq T_i, \quad (12)$$

where we have written K_i as a function of I_i in (11) to reflect the fact that foreign investment in region i will adjust to I_i so as to satisfy

$$\frac{\partial f}{\partial K_i}(K_i(I_i), I_i) = \frac{\partial f}{\partial K_j}(K_j, I_j) \text{ for all } j \neq i. \quad (13)$$

In this case, the condition needed for an SBC becomes

$$R_p + B_p + E_p - R_L - B_L - 1 > \beta\left(\frac{\partial f}{\partial K_i}\frac{dK_i}{dI_i} + \frac{\partial f}{\partial I_i}\right) = u'(z_i). \quad (14)$$

But notice that (14) is more stringent than (10) because

$$\frac{\partial f}{\partial K_i}\frac{dK_i}{dI_i} > 0.$$

That is, the marginal value of infrastructure investment is higher for a regional government than for a central government because additional infrastructure in region i lures foreign investors away from other regions, a consideration that is pertinent to the regional but not the central government. As competition amongst regional governments raises the marginal value of investment, the relative attractiveness of bailing out failing SOEs declines and so hardens the budget constraint. This hardening, however, comes at a cost: competition induces excessive infrastructure investment. This cost must be taken into account when assessing the implications of devolution.

It is worth emphasizing that the above argument concerns the hardening of *enterprises'* budget constraints through devolution. Decentralization of government does not, however, necessarily harden the budget constraints of *regional governments*. Indeed, just the opposite may occur: giving regional governments discretion over expenditure allows them to distort the composition of this expenditure in the hope of attracting funding from the central government (see Qian and Roland 1998 for further details).

3.3.2 *Privatizing Banks*

The foregoing models amply illustrate the proposition that hardening budget constraints is not a matter of direct policy choice but rather the indirect outcome of institutional changes in the relationship between funding sources and enterprises. So far we have supposed that enterprises are financed and refinanced by a government that cares not only about the financial return (R) on its investment but "overall social welfare" (as modeled by $R+B+E$).

Let us now examine the implication of having firms financed by a *private* bank which was the formulation of the initial Dewatripont-Maskin (1995) model. Such a bank would presumably be in the business of maximizing profit rather than social welfare. In terms of our analysis of section 2.2, the motivation of the S-organization is its best business interests. In that case, the condition for refinancing is transformed from (1) to

$$R_p - 1 > R_L \quad (15)$$

Notice that if

$$B_p + E_P - B_L > 0, \quad (16)$$

then condition (15) is more demanding than (1), in which case privatization serves to harden budget constraints. Furthermore, $B_p \geq 0$ and $B_L \leq 0$, and so unless E_p is highly negative, the budget constraint will indeed be harder with a private bank, a point made by Li (1992) and Klaus Schmidt and Monika Schnitzer (1993). This is an illustration of the well-known idea that ex ante efficiency can sometimes be improved if the threat of ex post inefficiency is introduced. In this case, the potential inefficiency results from the fact that the bank maximizes its own profit rather than social welfare.

Note, however, that even though SBCs may be jeopardized by privatization, they need not be eliminated altogether—(15) may still hold. Indeed, there is at least one reason why (15) may be particularly likely to hold in transitional economics: the liquidation value L may be low owing to limited private wealth and poorly functioning markets for liquidated assets. This effect helps explain the persistence of soft budget constraints even after privatization of enterprises and banks.

Besides having higher liquidation values, full-fledged market economies have two

other features that serve to limit SBCs more effectively than in socialist or transitional economies: competition and decentralization. In subsection 3.4 we explore this theme.

3.3.3 *Arrears and Redeployment*

We now introduce interactions between enterprises to explore the issue of trade arrears and their relationship to SBCs. Trade debt has been an important phenomenon since the early days of transition. After price liberalization, many firms became insolvent and could not pay their suppliers, so that payment arrears began to accumulate. In effect, clients were borrowing from their suppliers, which were themselves brought into financial difficulty as a result. So many firms were affected that banks felt constrained to bail large numbers of them out to avoid generalized insolvency.

The SBCs that arise when enterprises are linked together is an issue studied by Enrico Perotti (1993) and Fabrizio Coricelli and Gian-Maria Milesi-Ferretti (1993). In terms of our analysis of section 2.2, this is a case where externalities are an important motive for soft budget constraints. Suppose that enterprises with poor projects have the option of defensive restructuring (i.e., making their projects "good"), which requires effort on the part of managers, but no outside investment (see Irena Grosfeld and Roland 1997). Let θ be the proportion of enterprises exercising this option. Of poor projects that are not restructured, let λ be the proportion that are liquidated. Then, a proportion $(1-\alpha)(1-\theta)\lambda$ of all projects are liquidated. To capture the possibility of interaction among projects, assume that healthy enterprises—those with good or restructured projects—have supplier-customer relationships with those with poor projects. Specifically, suppose that the return on their projects decreases in proportion w to the proportion of liquidated projects in the total number of good and restructured projects. Then the return to the good and restructured projects is

$$\left(R_g - \frac{w(1-\alpha)(1-\theta)\lambda}{\alpha+(1-\alpha)\theta}\right).$$

This interaction creates a problem for the bank: a tough liquidation policy will spill over to healthy firms, causing their financial situation to deteriorate and therefore worsening the bank's own situation. The bank's expected profit as a function of θ and λ is given by

$$\Pi(\lambda,\theta) = (\alpha+(1-\alpha)\theta)R_g + (1-\alpha)(1-\theta)\left[\lambda(R_L-w)+(1-\lambda)(R_p-1)\right]-1.$$

The negative spillover of liquidation has the effect of reducing the liquidation value of a loan from R_L to $R_L - w$. Hence, budget constraints will be softened: the criterion for refinancing a poor project becomes $R_p - 1 > R_L - w$. That is, the stronger the trade links between firms with different projects, the softer the bank will be. By bailing out poor projects, the bank makes it possible for suppliers with healthy projects to be paid. But, of course, this softness also lowers an enterprise's incentive to restructure.

3.4 *The SBC in a Competitive Environment*

We now turn to the issue of SBCs in market economies. The models that follow show which crucial elements of the institutional environment of the capitalist economy generate hard budget constraints. This is extremely useful to understand the impact of particular transition reforms.

3.4.1 *Competition Across Enterprises*

As Ilya Segal (1998) argues, demonopolization of an industry may itself help harden budget constraints. To see how this may happen, let us modify the basic Dewatripont-Maskin model by supposing that an enterprise can be broken up into pieces that compete with one another. In line with the industrial organization literature, assume furthermore that competition reduces the return on investment to individual enterprises.

That is, suppose that the gross return from a poor project declines with the number of enterprises undertaking poor projects. Then if enterprises are financed and refinanced by private banks, only a limited number of poor projects will be bailed out (up to the point at which a poor project's net return equals zero). This limit on refinancing in turn will constrain the number of enterprises that choose to submit poor projects for financing in the first place: if there are too many poor projects, the chances that any one of them will be refinanced will be sufficiently low so that the enterprise's expected payoff is negative. Notice that competition hardens the budget constraint here not because banks' incentives to bail out poor projects have changed—indeed, these incentives remain the same—but rather because demonopolization credibly limits the number of enterprises that will be bailed out.

Formally, suppose that a monopoly is broken up into N separate enterprises, and let $R_p(n)$be the gross return on a poor project if there are n such poor projects. Assume that

$$\frac{dR_p(n)}{dn} < 0.$$

Then the number of enterprises bailed out will be no more than n^s where $R_p(n^s) = 1$. If a fraction $1-\alpha$ of the N initial enterprises has poor projects, then no more than a fraction x of these will seek initial financing, where

$$\frac{n^s}{x(1-\alpha)N}B_p + \left(1 - \frac{n^s}{x(1-\alpha)N}\right)B_l = 0.$$

The Segal (1998) model points to a general trade-off between excess capacity and HBCs. It has long been a tenet of the industrial organization literature that, if setup is costly, there will be too many enterprises—i.e., more than the efficient number—in a free-entry equilibrium (see, for example, Greg Mankiw and Michael Whinston 1986). As we have observed, however, a potentially important compensatory effect of those "excessive" numbers is a hardening of the budget constraint.

3.4.2 *Entry of New Projects*

Following Berglöf and Roland (1998), we next study what happens when new projects can enter and compete for funding with old projects. This entails adding an additional period—period 0—before period 1.

Suppose that a (private) bank finances projects at the beginning of period 0. Managers with poor projects must decide whether or not to submit them, taking into account the prospect of future bailouts. At the beginning of period 1, there is an influx of new projects. Hence, the bank must decide how to use the proceeds from period 0 investment—to finance new projects or to refinance poor projects (assume that there are more new projects than funds to finance them). Like their counterparts in period 0, managers with poor projects in period 1 must choose whether or not to submit them. In period 2, the bank must decide whether or not to refinance the poor projects from period 1 (using revenue generated from good projects in period 1). If projects are refinanced, they realize their returns at the end of period 2.

Given that $Rp > 1$, the bank has the incentive to refinance poor projects in period 2. Anticipating this, managers with poor projects will indeed submit them for funding in period 1. The expected net return to the bank from a new project financed in period 1 is therefore

$$\beta(R_g - 1) + (1-\beta)(R_p - 2), \qquad (17)$$

where b is the proportion of new projects that are good (β need not equal α).

Consider the bank's financing decision in period 1. If the bank opts to refinance existing projects before making new loans, managers with poor projects will submit them in period 0. Hence the bank's return from that refinancing is

$$R_p - 1 \qquad (18)$$

But if (17) exceeds (18), i.e.,

$$\beta > \hat{\beta} \equiv \frac{1}{R_g - R_p + 1}, \qquad (19)$$

the bank will prefer new projects, and so old projects will not be refinanced after all. That is, an HBC applies to the period 0 projects if and only if (19) holds. We conclude that the higher the average quality of the new cohort of projects, the harder the budget constraint for old projects.

This result may shed additional light on why SBCs have been a more persistent problem in transitional economies than in advanced industrialized economies (we already discussed this question in subsection 3.3.2). In the transitional economies of Eastern Europe, the average quality of new enterprise projects has been low, by comparison with that in advanced economies. Thus, banks may have preferred refinancing old projects, thereby perpetuating SBCs. Conversely, entry helps explain why the SBC phenomenon is not more widespread in advanced industrialized economies: vigorous entry by firms with high expected returns may make it less attractive for banks to refinance old loans rather than to invest in these very profitable projects, thereby hardening budget constraints for existing firms.

An immediate corollary of the analysis is that fewer new projects will be financed in period 1 if period 0 enterprises have SBCs. This result is notable because findings by Peter Dittus (1994) and others that, early in the transition process, banks had drastically cut the allocation of credit to enterprises led some observers to argue that budget constraints had been hardened. The Berglöf-Roland model reveals that, to the contrary, the credit crunch may have been induced by a softening of budget constraints.

3.4.3 *Decentralized Banks*

Dewatripont and Maskin (1995) argue that decentralization of credit serves as a mechanism for hardening budget constraints. Specifically, they show that if credit is dispersed, so that refinancing an enterprise requires funds from an outside bank, the constraints imposed by asymmetric information on bargaining between banks may make refinancing unprofitable. This is an important idea because it allows us to understand why soft budget constraints are very rare under capitalism. The specific mechanism in the model is that the bank that makes the initial loan may not have the funds to refinance a poor project. Thus, at least one additional creditor is required. The initial bank, however, is likely to have an informational advantage over the new creditor. This asymmetry creates an inefficiency, reducing the return from refinancing and making liquidation more attractive.

More formally, suppose that the ultimate return from a poor project depends on the (unobservable) effort level a exerted by the initial bank (this effort can be interpreted as the resources that the bank devotes to monitoring). Specifically, assume that the financial return of a refinanced poor project is $\overline{R}_p$ with probability a and 0 with probability $1 - a$. Let the bank's cost of a be $\Psi(a)$, where $\Psi(.)$ is increasing and convex.

In this setting, centralized credit means that if a poor project is refinanced, the initial bank will do it. Thus, the bank will fully internalize the benefit of monitoring in choosing its effort level:

$$R_p^C = \max\{a\overline{R}_p - \Psi(a)\}, \qquad (20)$$

with first order condition

$$\overline{R}_p = \Psi'(a^C). \qquad (21)$$

Provided that

$$R_p^C > 1, \qquad (22)$$

therefore, the bank will indeed refinance the poor project.

If the initial bank is liquidity constrained—as might be the case if credit is sufficiently dispersed—a new creditor may

have to be brought in for a project to be refinanced. The new creditor cannot observe the effort level that the initial bank exerted, and so must form a conjecture $\hat{a}$. If there is competition among potential refinanciers (so that they just break even), the new creditor will thus demand repayment of $\frac{1}{\hat{a}}$ (for its loan of 1) if the poor project is successful (if the poor project is not successful, there is no money for repayment). That is, the creditor anticipates a return of $\hat{a} \cdot \frac{1}{\hat{a}} = 1$. Thus, the initial bank solves the problem

$$\max_{a} \left\{ a\left(\overline{R}_p - \frac{1}{a}\right) - \Psi(a) \right\}.$$

Because, in equilibrium, the conjectured $\hat{a}$ must equal the actual effort level, the equilibrium effort level a^D under decentralization satisfies the first-order condition

$$\overline{R}_p - \frac{1}{a^D} = \Psi'(a^D). \tag{23}$$

Hence,

$$R_p^D = a^D \overline{R}_p - 1 - \Psi(a^D). \tag{24}$$

Comparing (21) and (23), we see that $R_p^C > R_p^D$, and so even if (22) holds, we may well have

$$R_p^D < 1, \tag{25}$$

in which case the project will not be refinanced[19]

In view of (22) and (25), we conclude that decentralization of credit may serve to harden enterprises' budget constraints. The mechanism at work in the particular model presented is a *liquidity constraint*; the initial bank cannot refinance the poor project out of its own funds. Alternatively, risk aversion on the part of the bank will deliver the same conclusion. That is, if decentralization leads banks to adopt undiversified portfolios (and, as we will note in a moment, there is reason to think that this may happen), then banks will be risk averse (relative to a centralized creditor with less highly correlated risks). This means that a bank that has already lent money to a poor project may find refinancing too risky to undertake—in which case the same logic we saw above would come into play. Thus, sufficient risk aversion can serve as a credible commitment against refinancing, and a bank may deliberately choose an undiversified portfolio to ensure that it attains this risk aversion.

Both liquidity constraints and risk aversion are most plausible when projects are large relative to the initial bank's total holdings. But other papers, including Paul Povel (1995) and Huang and Xu (1998), explore how decentralization may produce HBCs when projects need not be big.

Povel (1995) examines a model in which a project is financed from the outset by two banks. In effect, an HBC arises through a war of attrition between the investors. Suppose that an agreement on a restructuring plan is necessary to refinance a poor project and that each bank's assessment of the continuation value of the project is private information. The asymmetric information between banks can give rise to a delay in their negotiating an acceptable restructuring plan. If the value of the project declines over time, however, this delay may render refinancing unprofitable.

Huang and Xu (1998) study a related model in which two banks (investors) agree to lend jointly to a project precisely because they have conflicting interests concerning how the project should be organized should it be refinanced. Specifically, assume that each investor i, $i = 1,2$, observes a private real-valued signal s_i about reorganization.

[19] Note that if instead $R_p^D > 1$, decentralization of credit appears to be worse than centralization, since poor projects will now be refinanced but not monitored with sufficient effort. However, this result is from simply *assuming* that, under decentralization, the bank's liquidity constraint is binding. If instead, following Dewatripont and Maskin (1995), we allowed liquidity to be determined *endogenously* in a decentralized credit market, we would conclude that if $R_p^D > 1$, there is no difference in performance between centralization and decentralization.

Suppose that, in case of refinancing, the project could be completed either according to plan A or plan B. However, which plan will actually succeed depends on the investors' signals: if $s_1 > s_2$ then plan A is the right choice, whereas B is indicated if $s_1 < s_2$. Suppose that the investors have arranged matters so that the difference between investor 1's gross payoffs (i.e., the payoffs before any ex post transfer) from plans B and A is increasing in s_1, while the difference between investor 2's gross payoffs from plans A and B is increasing in s_2. Then it is easy to show that there is *no* mechanism that ensures the correct choice between A and B. To see this intuitively, note that there is an inherent conflict between investors' incentives and making the right choice: as $s1$ rises, plan A grows more likely to be the right option, but investor 1's preference for plan B strengthens. Thus, eliciting the signal value from investor 1 becomes more difficult. By purposely ensuring that they have different information, the banks may be able to commit themselves not to refinance a project that they have jointly invested in.[20]

Huang and Xu apply this argument to illuminating the East Asian crisis of the late 1990s. They note that the Korean *jaebols* were subject to centralized financing and suffered from lack of financial discipline and SBCs. By contrast, Taiwan's economy was characterized by dispersed financial institutions and decentralized banking. In the event, Taiwan suffered much less from the crisis than Korea (even though it too was attacked by speculators). By embedding their SBC model in a framework that includes bank runs, Huang and Xu account for both the East Asian "miracle" and its crisis. The idea is that in an economy where innovation consists mainly of imitation, there will be high bank liquidity and high growth when the proportion of poor projects is sufficiently low, regardless of whether budget constraints are soft or hard. But when the proportion of poor projects rises above a certain level, then the economy is vulnerable to bank runs unless budget constraints are hard. This is because SBCs promote poor projects, and a poor project increases the general cost of borrowing on the interbank lending market, which normally serves as a counterweight to bank runs. Therefore, an increase in SBCs promotes bank runs. Notice that this logic has little to do with the transparency or regulation of the interbank lending market, the issues that received most attention in the debate about the East Asian crisis.

We have been discussing models in which a multiplicity of creditors make refinancing more difficult. This is a theme, however, that reaches well beyond the literature that invokes the term "soft budget constraints." Some of the papers outside that literature include Patrick Bolton and David Scharfstein (1996); Erik Berglöf and Ernst-Ludwig von Thadden (1994); Dewatripont and Tirole (1994); and Oliver Hart and John Moore (1995).

Although an HBC has positive incentive efforts, it can also induce "short-termism" among managers with good projects, as von Thadden (1995) and Dewatripont and Maskin (1995) argue. To see this, modify the model of subsection 3.1 so that managers with good projects can choose between a "quick" outcome yielding return R_g and private benefit B_g after one period or a "slow" outcome yielding 0 after one period but, with an additional infusion of capital, R_s and B_s by the second period, where $R_s - 2 > R_g - 1$ and $B_s > B_g$. Notice that the slow option is more profitable than the quick one, but that, at the end of period 1, it cannot be distinguished from a poor project.

With an SBC, poor projects will be refinanced but so will slow (good) projects. By contrast, with an HBC only quick projects will be refinanced. If the high profitability of

[20] This logic is reminiscent of the literature on using contracts as a barrier to entry (see Aghion and Bolton 1987).

the slow projects sufficiently outweighs the inefficiency of the poor projects, an SBC may therefore be desirable. In other words, by promoting only quick (i.e., short-term) projects, a hard budget constraint equilibrium sacrifices the potentially higher gains from long-term projects.

This reasoning bears on the contrast between the Anglo-Saxon and German/Japanese financial systems. In the 1980s, the idea was put forward that market-oriented corporate finance, as practiced in the United Kingdom and the United States, can be "short-termist" (J. Corbett 1987), compared to the bank-based systems of Germany and Japan, which provide more long-run finance and liquidity to firms (but also suffer from more poor projects). Thus, the U.K./U.S. system can be viewed as corresponding to HBCs; the German/Japanese system to SBCs.

The analysis changes somewhat if we allow for entry, as in the Berglöf and Roland (1998) model. Dewatripont and Roland (2000) show that, although the HBCs induced by decentralized credit may promote short-termism, they may also serve to mobilize financial resources quickly for financing new innovations. Assume, to simplify matters, that one unit of capital is exogenously available for financing at both periods 0 and 1. Suppose that the new projects available in period 1 are homogenous with return R_n. Finally, assume that

$$(1-\alpha)R_p^D < R_n - \alpha R_s < (1-\alpha)R_p^C, \quad (26)$$

where R_p^D and R_p^C are the return to a poor project under decentralization and centralization as given by (24) and (20), respectively, and R_s is the return from a "slow" project. Notice that the second inequality in (26) implies that, under centralization, there will be no funds in period 1 to finance new projects: all money will be allocated to refinancing slow and poor projects since the opportunity cost R_n of refinancing is lower than its benefit $\alpha R_s + (1-\alpha)R_p^C$. However, if

$$\alpha R_s + (1-\alpha)R_p^C - 1 < R_n \quad (27)$$

this allocation will be inefficient ex ante: the ex ante return from new projects is higher than that from period 0 projects. By contrast, the first inequality in (26) implies that poor and slow projects would *not* be refinanced if credit is decentralized. Hence, under decentralization, managers with good projects will elect the quick option, those with poor projects will not seek funding for them, and new projects will be financed.

The Dewatripont-Roland argument suggests that a decentralized financial system—as in the United States—may be better able to respond to rapid technological change than the more centralized bank-oriented systems of Germany and Japan, which emphasize long-run risk-taking.

3.4.4 *Ex Ante Screening*

Although most of the literature emphasizes how the dispersion of capital hardens budget constraints, there are cases where larger banks can more easily commit to terminate projects. For example, in their (1998) model, Berglöf and Roland show that, if a bank is big enough, it can afford to invest in screening activities that allow it to reject some poor projects at the outset and also some of the new poor projects in period 1. The latter effect enhances the attractiveness of funding new projects and so hardens the budget constraint for those begun in period 0. A similar argument is made by Schnitzer (1999), who emphasizes that the screening benefits of bigness may be particularly important in transition economies.

If, however, there are complementarities between the activities of screening and monitoring (in the extreme case, if the same investment that permits screening also makes monitoring possible), then there will be a tension between enhanced screening (which improves the mix of funded projects) and enhanced monitoring (which makes refinancing more attractive and hence softens the budget constraint). If the second

effect is strong enough, banks may rationally choose to refrain from screening—and the potential advantage of larger banks vanishes. In a similar vein, Antoine Faure-Grimaud (1996) shows that when a regulated firm relies on the stock-market for financing, then the additional scrutiny provided by the market may raise the probability of a bailout and so weaken the firm manager's incentives—a syndrome often witnessed in transitional economies.

3.5 *SBC in Banks*

The discussion so far has concerned models (or more precisely, institutional interpretations of models) in which the BC-organization is an enterprise and the rescuer (the S-organization) is a state and/or a bank. We now turn to another set of circumstances, in which the BC-organizations are banks and the role of S-organization is played by somebody else, such as a state or a central bank. Situations in which banks face SBCs are by no means confined to transitional economies. In recent years we have witnessed, for example, the 1980s savings and loan bailout in the United States, the early 1990s bailout of the Swedish and Finnish banking systems, and the late 90s bailout of banks in Asia.

The analysis of soft budget constraints of banks enriches substantially our understanding of the soft budget constraint phenomenon. Indeed, one has now interactions between three tiers of agents instead of two, the bank being a BC-organization for the government but still an S-organization for the firm. The cause of soft budget constraints of firms will now not necessarily be any more the wedge between the ex ante and ex post financial return to the bank. The bank may indeed be induced to bail out firms because it can exploit in different ways the government's softness.

3.5.1 *Bank Passivity and Gambling for Resurrection*

Mitchell (1998) analyzes the phenomenon of bank passivity, in which a bank fails to liquidate poor projects because it anticipates being bailed out by the government if it gets into difficulty. The bank can either refinance the loan to a poor project or liquidate it. The expected financial return from rolling over is negative, but the possibility of bailout serves as downside insurance. Thus the bank has the incentive to gamble on a project's "resurrection": the bank benefits from the upside of such a decision and does not suffer the consequences of the downside. To prevent such gambling, the government may try to monitor the bank.

More specifically, consider the model of subsection 3.1 but suppose that, if refinancing occurs, the net return (i.e., the return net of the cost of refinancing) from a poor project is *negative* in expectation but *stochastic*: with some probability, it is positive (the case of "resurrection") and with some probability it is negative ("failure"). Suppose that in the case of failure, the government must make up the shortfall in the bank's accounts. Because of the negative expected return, it would wish the bank manager to liquidate poor projects, and would threaten him with ouster if he failed to do so. It is reasonable to assume, however, that accurately determining whether such liquidation actually occurred would be costly. Thus, in equilibrium, it is quite possible that the social benefit accruing from liquidations could be outweighed by the expense of monitoring intensely enough to deter the manager from gambling for resurrection, in which case, such gambling would occur.

3.5.2 *Rent Seeking by Banks*

In the previous subsection, a bank received a subsidy from the government to keep it solvent, but there are other reasons for bailing out banks. In this subsection, following Berglöf and Roland (1995), we explore the possibility that the government will subsidize a bank in order to induce it to refinance poor projects. This sort of effect—which is an important feature of transitional economies (see Ron Anderson and Chantal

Kegels 1997, and Perotti 1993)—derives from the likelihood that the government, unlike the bank, cares not only about verifiable revenue but also about such "external effects" as workers' employment.

To explore this effect, assume now that $R_L > R_p - 1$, i.e., that the bank does not directly benefit from refinancing a poor projects. Suppose that in period 0 the government endows the bank with N units of capital and that there is a deadweight cost λ per unit of capital raised. A total of N projects could, in principle, be financed, but the bank may choose to finance only k (and keep reserves $N-k$). In period 1—when poor projects are subject to refinancing—the government may provide a subsidy S (at cost $S(1+\lambda)$). The subsidy is paid after the bank commits to bailing out poor projects. By assumption, the government cannot recover the returns from refinancing; its only instrument is S. However, because the government maximizes total welfare, it is willing to pay the subsidy if the benefit it promotes exceeds the deadweight loss it creates. If the bank's liquidity position can be observed perfectly by the government, the subsidy will exactly cover the extra funds needed to bail out poor projects. For its part, the bank will accept the subsidy if S at least offsets the loss from refinancing. One can easily show that the bank will want the subsidy only if the proportion of good projects is below a certain threshold.

One way to restore a HBC would be for the bank to set aside reserves by financing fewer than N projects. That is, sufficient ex ante capitalization with reserve requirements would credibly commit the bank not to seek subsidies.

Note that if the government could identify the bad loans in the banks' portfolio, it could also refinance them itself, e.g., by transferring them to a specialized government agency. Such "hospital" agencies have been set up in many transitional economies to clean up bank portfolios and to avoid subsidizing banks for refinancing poor projects. If *all* bad loans were transferred, the government's expenses would exceed those from subsidizing the bank, since the government would have to bear the full cost of refinancing. However, not all bad loans need be transferred to a hospital bank. Indeed, transfers of bad loans have the effect of raising the proportion of good projects in the bank's loan portfolio which, above a certain threshold as seen above, deters the bank from seeking subsidies. Thus, hospital banks, while not solving the SBC of the firms they refinance may help reduce the incentive of banks to engage in rent seeking.

Transferring bad loans may be more difficult when the government does not know how many such loans a bank has in its portfolio. Mitchell (1995) shows that punitive measures directed against bank management may lead the bank to conceal or underestimate the extent of bad loans. By contrast, Aghion, Bolton, and Fries (1999) show that policies in which the bank is recapitalized in compensation for bad debts may give it the incentive to overstate its bad debt problem. One way to strike a proper balance between these two effects is through a scheme that combines partial recapitalization with the transfer of bad loans out of the bank's portfolio. Aghion, Bolton, and Fries (1999) work out the transfer "price" that the bank must receive for loans to ensure incentive compatibility.

Antoine Faure-Grimaud and Jean-Charles Rochet (1998) study the consequences of different modes of privatization for SBCs, specifically, the question of whether it is better to put current or new management in charge of banks. They suppose that a current manager has a better knowledge of the loan portfolio than a newcomer. But as a result, the manager has an advantage in extracting surplus from enterprises if refinancing occurs. This superior surplus-extraction ability may exacerbate the SBC syndrome because it makes refinancing more likely. Thus, the authors conclude that it may be better to

put newcomers in charge precisely because their information is worse.

3.5.3 *Lenders of Last Resort*

When there is financial-market failure (e.g., a breakdown of the interbank lending market), it may be desirable for the government to step in and provide liquidity to prevent bank run contagion. Charles Goodhart and Dirk Schoenmaker (1995) show that in recent years a high percentage of failing banks have enjoyed government bailouts.[21] But bailing out illiquid banks is costly. The cost of bailout has been as high as 30 percent of GDP in Japan and 27 percent in Mexico (Freixas 1999), bringing the central bank's role as lender of last resort (LOLR) into serious question.[22]

Having a central bank as LOLR was first proposed by Henry Thornton (1802), with the details worked out by Walter Bagehot (1873). The Bagehot rules emphasize that a central bank should lend only to solvent but illiquid institutions (i.e., those with good collateral). Clearly, this is intended to curb the SBCs of banks.

Following the Bagehot logic, noninterventionists argue that bailouts distort the incentives of bank managers and induce them to take excessive risk (M. Goodfriend and R. G. King 1988; Thomas Humphrey 1989; and A. Schwartz 1995). To avoid the SBC problem, they suggest that the central bank should intervene only at the macroeconomic level through open market operations. Their critics retort that a bank's failure generates externalities, such as bank-run contagion; and so bailing banks out may be efficient after all (F. Mishkin 1995; Anthony Santomero and Paul Hoffman 1998; Freixas 1999; and Freixas, B. Parigi, and Rochet 1998). Moreover, the Bagehot rule of lending only to solvent banks is often not implementable because solvency is difficult to determine. Indeed, Goodhart (1995) contends that in most cases it is impossible to distinguish illiquidity from insolvency. Finally, it is debatable whether the central bank should confine its bailouts to solvent banks, since as Goodhart and Huang (1999) argue, letting even insolvent banks go under may trigger bank runs. Indeed, Goodhart and Schoenmaker (1993) make the case that it is really only insolvent banks that need lending of last resort anyway.

Goodhart and Huang (1999) suggest that one way to limit the SBC problem when the central bank acts as LOLR would be to restrict bailouts to very large banks. That is, a too-large-to-fail policy may be optimal. Freixas (1999) argues instead for a "creative ambiguity" approach: bailing out banks randomly. Huang and Xu (1999) show that although the too-large-to-fail policy may be optimal when restricted to short-run and narrowly defined problems, it may lead in the long run to inefficient bank mergers, which could be harmful. Indeed, if all banks were large, they would all qualify to be bailed out, giving rise to an aggravated SBC problem. Thus, Huang and Xu (1999) argue, the optimal LOLR policy should not be separated from financial reforms such as decentralization of banking.

3.5.4 *Financial Crisis*

Various authors (e.g., Krugman 1998) have argued informally that certain financial policies, such as bailing out firms and banks and providing government guarantees to private investment, had much to do with the East Asian financial crisis that began in 1997. Such policies are, of course, intimately connected with SBCs.

Huang and Xu (1999) develop a formal theory to explain financial crises from the standpoint of the SBC syndrome. In their model, there are many banks, each of which receives deposits and invests in enterprises' projects. Banks rely on the interbank lending market to ease liquidity shortage problems

[21] In their sample of 104 failing banks, 73 were rescued and only 31 were liquidated.

[22] Particularly, in the U.S. savings and loan crisis, the Mexican crisis of 1994, the failure of Crédit Lyonnais, and the collapse of Long Term Credit Bank of Japan.

when they face liquidity shocks. There are numerous depositors who, as in Douglas Diamond and Philip Dybvig (1983), are divided between early consumers (those who consume only at date 1) and late consumers (who consume only at date 2). Ex ante all depositors are identical in that they do not know their own types until date 1 and make their deposit decisions ex ante. There are many enterprises which have to rely on banks to finance their projects. Projects are of two types, good and poor, as in the previous sections.

As in the models of subsection 3.4, enterprises' budget constraints will be hard if projects are financed by multiple banks. In contrast, they will be soft if projects are financed by single banks (or by the government).

Whether there are hard or soft budget constraints, every bank stores the optimal amount of cash to meet expected early consumer withdrawals. The interbank lending market is an instrument for banks to avoid bank runs when some of them face idiosyncratic liquidity shocks, i.e., excess early withdrawals. In a hard budget constraint economy, a bank liquidates any poor project that it has funded, and the liquidation is observable by other banks as well. Given this common information, a bank has no problem borrowing if it faces excess early withdrawals. And so bank runs do not occur.

In an SBC economy, project types are not publicly known, because poor projects are not terminated. Thus when a bank faces liquidity shocks and needs to borrow, potential lenders assume that its portfolio is poor. This raises the cost of borrowing. Thus, when a liquidity shock is sufficiently severe, even banks with good projects may be forced into liquidation. Anticipating this, depositors may be induced to make larger than normal early withdrawals, possibly precipitating a bank run.

Rochet and Tirole (1996) study how interbank lending itself can create SBCs. Imagine that bank A is in distress and that, according to the interbank agreement, bank B is supposed to lend to it. Such a loan may leave the lender insolvent, requiring rescue by the central bank. But the prospect of this rescue will dull bank B's incentives to monitor A.

3.6 *Other Conceptions of SBC*

In subsections 3.1 through 3.5, we examined models that conceive of the SBC syndrome as a problem of dynamic commitment. In our view, this has been a fruitful approach for understanding the syndrome. At the same time, there have been several interesting alternative conceptions as well.

3.6.1 *Political Intervention in Firms*

Boycko, Shleifer, and Vishny (1996) associate the SBC syndrome with the interventions of politicians in firms. Specifically, they model a situation where politicians in power pay subsidies to enterprises to induce them to retain excess labor. There is no dynamic element to their model and hence no problem of commitment. Indeed, "softness" here is viewed as something desirable by politicians, as it allows them to influence enterprises' employment policy. The model suggests, however, that such influence is easier to wield when firms are state-owned rather than private. Consider a model with two agents: a firm and a politician. The firm has profit function $\Pi(a)$, where a, a measure of the firm's effort, can assume two values, a^* and a^{**}. Assume that

$$\Pi(a^*) > \Pi(a^{**}). \tag{30}$$

Suppose that the politician has payoff function $B(a)+\beta\Pi(a)-t$, where t represents a transfer to the firm's manager and β corresponds to the fraction of the firm's profit owned by the government (suppose that the remaining fraction $1-\beta$ is owned by the manager). The function $\beta(\cdot)$ incorporates any objective besides profit that matters to the politician, e.g., employment, output, or consumer surplus. Let us suppose that:

$$B(a^{**}) > B(a^{*}) \text{ and } B(a^{**}) + \Pi(a^{**}) > B(a^{*}) + \Pi(a^{*}). \quad (31)$$

The two inequalities imply that, in the absence of transfers, the politician prefers a^{**} to a^{*}.

Let us distinguish among three cases. We call *pure centralization* the case in which the government, and thus the politician in power, owns both the profit rights (i.e., $\beta = 1$) and the control rights to the firm (i.e., the government gets to choose a). Under pure centralization, the politician will choose $a = a^{**}$, given assumption (31). Although this choice may not be socially optimal (unless perhaps $B(\cdot)$ is a good measure of consumer surplus)—and, in view of (30), is certainly not profit-maximizing—it entails no transfers and hence no SBC.

Let us now look at the case where the government has profit rights but no control rights, i.e., a situation in which β is big, but the manager has control. This can be interpreted as a socialist economy with more enterprise autonomy or a transition economy in which firms are not yet fully privatized but government has lost direct control over their decisions. Thus, the politician will have to pay a transfer to the manager in order to implement the action $a = a^{**}$ (the manager has payoff function $(1-\beta)\Pi(a) + t$, where t is the size of the transfer he receives). Suppose that the politician can propose a transfer as a take-it-or-leave-it offer. Then he can induce the manager to choose $a = a^{**}$ rather than $a = a^{*}$ provided that he proposes a transfer of $(1-\beta)(\Pi(a^{*}) - \Pi a^{**})$. It will be worthwhile proposing this transfer provided that

$$B(a^{**}) - B(a^{*}) + \beta(\Pi(a^{**}) - \Pi(a^{*})) - C((1-\beta)(\Pi(a^{*}) - \Pi(a^{**}))) > 0, \quad (32)$$

where $C(x)$ is the cost (to the politician) of making a transfer of size x. $C(x)$ may well be substantially bigger than x, e.g., because of the deadweight loss from raising the revenue to pay the transfer (if this is of concern to the politician) or because of the risks entailed in circumventing anti-bribery laws if the transfer is a bribe. However, if β is high, then (32) is relatively easy to satisfy. Thus, in this case, the equilibrium choice is likely to be $a = a^{**}$, the same as under pure centralization. The difference, of course, is that now a transfer is needed to sustain a^{**}, and this itself may create distortions (e.g., deadweight losses). Finally, consider the case of *pure decentralization,* in which β is low and the manager has control. Here, (32) is harder to satisfy. If it fails to hold, the manager will choose $a = a^{*}$ (the profit-maximizing action), and there will be no transfer.

Notice that the possibility that (32) does not hold relies on the inequality of $C(x) > x$. If $C(x) = x$, then in all three cases, the left-hand side of (32) reduces to

$$B(a^{**}) - B(a^{*}) + \Pi(a^{**}) - \Pi(a^{*}),$$

which, from (31), is positive. That is, $a = a^{**}$ is optimal (from the standpoint of the politician and the firm, not necessarily society) regardless of the distribution of ownership and control rights (this is just an example of the Coase theorem). Thus the profit-enhancing property of pure decentralization is due to the possibility that the politician's marginal cost of making transfers is greater than 1.

One implication of the model (and of the similar model in Shleifer and Vishny 1994) is that politicians can intervene more easily in a state-owned firm, because either they have control rights or they can, relatively cheaply, induce an efficiency-oriented manager to make an inefficient choice in their interest. When firms are private, the costs of intervention are greater and therefore imply less political intervention in firms. In this interpretation, soft budget constraints are manifested in the subsidies that are paid to efficiency-oriented managers to convince them to make inefficient

choices. Notice that the model makes the prediction that firms in transition economies, where politicians have profit but not control rights, will experience the softest budget constraints.

The very concept of decentralization in the Boycko-Shleifer-Vishny model differs from that in subsection 3.4. In that earlier section, the term means "diffuseness of power" (either financial or productive), but here it denotes taking profit-ownership and control out of the hands of government. Another difference turns on the concept of optimality. In the models of subsection 3.4, decentralization led to higher social surplus than centralization. In the current model, such a result is not so clear: centralization entails maximizing $B(a)+\Pi(a)$, whereas decentralization implies maximizing $\Pi(a)$. Thus, only if the former objective is a worse approximation to "social surplus" than the latter does decentralization dominate. In particular, if $B(a)$ corresponds to consumer surplus, centralization would dominate.

3.6.2 *SBC as a Control Instrument*

Bai and Wang (1996) show that SBCs may be deliberately introduced by a center in order to control an agent. Suppose that the center owns a large number of potential projects but must rely on an agent to assess each project's profitability and hence whether or not it should be launched. Suppose that a project, if launched, takes two periods to complete and requires a capital input costing c each period. The agent can exert (unobservable and costly) effort to pre-screen the expected gross returns of a fraction e of these projects ex ante (where e increases with effort). It then launches a number of the potential projects, including all projects that pre-screening indicates are profitable (i.e., the projects whose gross return exceeds $2c$), but possibly also some projects that have not been pre-screened. At the end of the first period, it learns the expected gross returns of all launched projects and can choose to terminate some of them, thereby saving the cost c of continuing them for a second period. Presumably, any project that is terminated would be one that is unprofitable to complete (i.e., one for which the expected gross return is less than c), but, as we will see, not all unprofitable contracts ought to be terminated.

The agent requires a fee from the center to induce it to exert effort. But because effort is unobservable, the fee must be made contingent on the variables that the center *can* observe: the total net return (which is assumed to be the sum of the expected gross returns of completed projects less the capital costs of all completed and terminated projects, plus noise), the number of projects launched, and the number of projects terminated after the first period. Assume that, on average, a project that is not pre-screened turns out to be unprofitable to complete. Bai and Wang show nevertheless that if the agent is risk-averse then the optimal fee schedule will have the properties that the agent should (i) launch some project that it has not pre-screened and (ii) allow some unprofitable projects to be completed.

To see why this is so, suppose that there are just two possible effort levels: an optimal level and a lower level. Then one would expect that, when confronted with the optimal fee schedule, the agent will be left just indifferent between these two levels (i.e., his "incentive constraint" will be binding). Now suppose, contrary to the claim, that the agent launches no project that it has not pre-screened (i.e., the set of projects launched consists only of projects that pre-screening indicates are profitable). Suppose that the center now slightly increases the number of projects it requires to be launched. This will, in effect, force the agent to launch some projects that it has not pre-screened. Since this change will reduce the overall net return on average, it will lower the agent's expected fee. Thus the agent's expected utility will fall, whether he exerts the optimal or lower level of effort. But because his expected marginal utility of income is higher when effort is low

(since his expected fee is lower), his expected utility will fall *more* in that case than when his effort is optimal. Hence, the agent's incentive constraint will be relaxed, which, given that the fall in the agent's utility when he exerts optimal effort is zero to the first order, means that the fee schedule could not have been optimal to begin with, and so property (i) is established. For exactly the same reason, if the center slightly decreases the number of projects it requires to be terminated after the first period (i.e., slightly increases the number of projects it requires to be completed), the agent's expected utility will again fall more for low effort than for optimal effort, implying the same sort of incentive relaxation as before. This establishes property (ii).

4. *Concluding Remarks*

4.1 *A Broad Range of Phenomena, a Common Framework of Analysis.*

The SBC syndrome embraces a broad range of phenomena from economic life, and there are many different ways in which the budget constraint could be softened. Nevertheless, the syndrome gives rise to specific and predictable patterns of behavior among economic agents. We hope to have convinced the reader that the SBC concept and its formalization, e.g., through the dynamic-commitment approach, constitute useful unifying devices. Most of the work discussed in this article applies the terminology and conceptual apparatus of the SBC literature explicitly. However, some papers cited do not invoke these concepts or language. We do not wish to suggest that these are fatal omissions. Nevertheless, we feel that something of importance may thereby be lost.

Numerous examples in the history of the social sciences indicate that vividly descriptive concepts, metaphors, models, or analytical tools can have an inspirational effect (a classic instance is the enormous fruitfulness of the prisoner's dilemma game in economics and political science). Such devices highlight the essence of complex situations and encourage researchers to seek similarities across apparently disparate phenomena. We believe that the notions, theories, and models of the SBC framework have played such an inspiring role and can continue to do so. Time and again, researchers who are steeped in the conceptual apparatus and analytical methods of the SBC syndrome have drawn and reinforced connections that have escaped others' attention.

4.2 *Extensions Beyond Socialism and Post-Socialist Transition*

We have mentioned repeatedly that the idea of the SBC was initially inspired by the study of socialism and that it has recently attracted a great deal of attention through its application to problems of post-socialist transition. We have insisted, however, that the SBC syndrome not be thought of as wedded only to the socialist system or to transitional economies. It can arise in *any* economic system. All that is needed is the confluence of certain elements: a BC-organization and one or several S-organizations with the incentive to provide financial rescue. Unquestionably, these elements come together more frequently and in a wider set of cases under socialism and post-socialist transition than under systems where socialism has never arisen. The effects of the SBC syndrome, however, are clearly perceptible in the traditionally capitalist world as well.

In particular, many empirical studies demonstrate the existence and deleterious effect of the SBC syndrome in the public sectors of non-socialist countries; see for example on SBCs in enterprises: Martin Raiser (1994) on 32 developing countries; Gun Eriksson Skoog (2000) on Tanzania; Lisa Anderson (1995) on Middle-East Arab countries; Ann Bartel and Ann Harrison (1999) on Indonesia; Sumit Majumdar (1998) on India; Jorge Braga de Macedo (1990) on Portugal; Elisabetta Bertero and Laura Rondi (2000 2002) on Italy. Tornell (1999) analyzes enterprises and banks in

Latin America; Lorenz Nett (1992) and Rosella Levaggi and Roberto Zanola (2000) look at medical service provision in Italy; Moesen and van Cauwenberge (2000) give evidence on local governments in nineteen OECD countries; Matts Dahlberg and Per Petterson-Lidblom (2002) on Swedish local governments; Jonathan Rodden, Gunnar Eskeland, and Jennie Litvack (2002) on fiscal federalism; and Duggan (2000) on U.S. hospitals.[23]

Huang and Xu (1998, 1999) pioneered the study of capitalist financial crises from the standpoint of the SBC syndrome. In particular, they provide micro-foundations for a macroeconomic analysis of the East Asian crisis of the late 1990s (see the discussion in subsection 3.5.4). It would be useful to carry out similar research into earlier crises (e.g., the early 1990s crisis in Mexico and the current one in Argentina). In no case are we prepared to say that the SBC syndrome is the only cause. We believe, however, that it is invariably an important contributing factor, with an influence differing from country to country and crisis to crisis. Specifically, it clearly plays a role in the accumulation of bad loans, demand inflation, and the creation of bubbles.

Many students of the SBC syndrome compare economies of similar political and economic dispositions (e.g., they examine the similarities and differences between two transitional economies). Others contrast economies from opposite ends of the spectrum (e.g., they compare the SBC of socialist systems with the HBC of capitalist economies). But more general comparisons would probably require a more systematic methodological approach. Such an approach would entail a set of strictly comparable indicators, with uniform definitions and rules of observation and measurement. Indicators such as those listed in table 1 could be observed and measured in many countries with a standardized methodology. Of course, the obvious candidates for initiating and organizing the introduction of a uniform methodology are international financial institutions, e.g., the World Bank and EBRD.

[23] The list contains only studies that use the conceptual apparatus of the SBC literature.

4.3 *SBC and Other Dynamic Commitment Problems in Economics*

The soft budget constraint is only one of several important commitment problems that have developed literatures since time consistency was recognized as a significant economic issue (Finn Kydland and Edward Prescott 1977) and sequential rationality was introduced in game theory (Reinhard Selten 1965). These literatures often highlight how particular institutional solutions can solve serious commitment problems.

We already mentioned the ratchet effect (Weitzman 1980; Laffont and Tirole 1988), in which a principal changes an agent's incentive contract to exploit information he has acquired from performance about the agent's ability. Anticipating these changes, the agent is motivated to distort his performance to hide his ability. This problem was omnipresent under socialism. Unlike the soft budget constraint syndrome, however, transition drastically reduced occurrences of the ratchet effect. Once a private market for managers appeared, managers could leave the state sector, and the competition for good managers that this market created forced government to refrain from changing contracts (Gérard Roland and Khalid Sekkat 2000).

The classic commitment problem for monetary policy (Robert Barro and David Gordon 1983) arises because once agents have formed inflationary expectations, a monetary authority will attempt to create surprise inflation to boost output. Agents anticipate this incentive, which only aggravates the inflationary problem. Here, an institutional solution is to appoint a conservative central banker who cares solely about inflation (Kenneth Rogoff 1985), or devise

incentive schemes for central bankers that induce a similar result (Torsten Persson and Guido Tabellini 1993).

A critical commitment issue in fiscal policy is the so-called capital levy problem (Fischer 1980). Capital is ex ante highly elastic and thus should be subject to low tax rates, but once it has been sunk, it becomes inelastic, creating the temptation for the government to increase tax rates to predatory levels. A similar problem arises with the repayment of public debt (Persson and Tabellini 1990). Ex ante, the government borrows, to finance public good provision, but ex post has the incentive to renege on repayment to avoid imposing distortionary taxes. The issue appears yet again in international economics with the repayment of sovereign debt. Governments want to borrow ex ante but often have little motivation to repay debt ex post (Jeremy Bulow and Rogoff 1989).[24]

Although these commitment models differ in many details we can still classify them in two broad categories: those with a "predatory" principal and those with a "weak" principal. Situations with a *predatory principal* are those in which the principal can exploit the agent ex post. Phenomena in this category include the ratchet effect, the capital levy problem, and the monetary policy problem. Situations with a *weak* principal are those in which the reverse is true: the agent can exploit the principal ex post. This is undoubtedly the case with the soft budget constraint but also with the sovereign debt problem and with a variety of other situations involving noncredible punishment.

Finally, let us mention the hold-up problem (Oliver Williamson 1975), in which a party has the incentive to squeeze more surplus out of his trading partner once the other has invested in the trading relationship. Although it too represents a failure of commitment, it is typically modelled not as a dynamic adverse selection or moral hazard problem—as are the SBC syndrome and most of the other commitment problems discussed above—but as the outcome of incomplete contracting (Hart 1995).

4.4 *Softening and Hardening the Budget Constraint from a Secular Historical Perspective*

Studying the softening and hardening of budget constraints over historical time poses a formidable intellectual challenge, requiring a synthetic approach to changes in politics, society, the economy, and the law. Nevertheless, a few simple generalizations can be made. In the early days of capitalism, the budget constraint was for the most part hard. Think, for example, of debtors' prisons, of borrowers compelled to auction off their personal property, and of businessmen for whom the threat of bankruptcy led to suicide. Since that time, the capitalist budget constraint has gradually softened. The introduction of the principle of limited liability in corporate finance, less draconian bankruptcy regulations, and modern forms of separation and interweaving of ownership and management have all served to protect managers from the adverse consequences of their actions. Indeed, the fact that the executives of a corporation can survive the financial ruin of the company they manage without losing their own property may have created a mentality similar to that under the SBC syndrome. A critical review of modern capitalism in the light of SBC phenomena would certainly seem extremely worthwhile.

The history of SBCs under the socialist system is interesting as well. In pre-reform socialism, SBCs permeated all organizations. The first market reforms attempted to impose the requirement that the budget constraint be hardened, but such attempts largely failed. To understand this failure calls for an interdisciplinary study, a demanding undertaking.

[24] Commitment issues have been studied in a wide variety of other economic fields, including how the Glorious Revolution in England led to political changes that created commitment against predatory behavior by the king (Douglass North and Barry Weingast 1989).

4.5 *Normative Implications*

The work reviewed in this paper is, for the most part, *positive* in nature. The "meta-model" of the typical research pattern can be described as follows: An author singles out some aspect of the SBC phenomenon, devises a model that focuses on some of the causes and consequences, and abstracts away the others. Policy implications of the analysis are drawn with caution because of the acknowledged limitations of the model.

Of course, the need for normative caution is common to economic research far beyond that on the SBC syndrome. No single theoretical work can be expected to give a comprehensive analysis of the causes and effects of any complex phenomenon. Nevertheless, a responsible decision about whether, say, an indebted corporation should be rescued can be reached only after consideration of all direct and indirect consequences.

Such matters are rarely clear-cut. The SBC literature may give the impression that hardness is "good" and softness "bad." But if this were literally true, it is hard to imagine that the SBC syndrome would be so widespread or recurrent.

The dilemma is especially agonizing when the rescue of an entire economic sector or nation is on the agenda. Almost always, preservation of national stability provides a strong argument for going through with such a bailout. Yet even in these cases, the logic is not completely one-sided, since rescue will presumably have unfortunate repercussions on expectations of future bailouts, contributing to the perpetuation of SBC phenomena.

A major shortcoming of the literature on the SBC is the absence of a systematic exploration of normative implications. No one expects to devise a simple formula that will determine, in any given situation, the breadth and magnitude of the bailout that is called for. Still, comprehensive normative evaluation seems a feasible scientific task. Potential short-term consequences of a bailout can be clearly enumerated. Theoretical and empirical examination of the tradeoffs between short-run benefits and long-run costs is more difficult, since it must draw on political, sociological, and even ethical thinking, besides purely economic analysis. But it seems far from impossible.

Finally, we hope that the present survey of the rich literature on the SBC syndrome will contribute to a further expansion of this research program.

References

Abdelati, Wafa and Stijn Claessens. 1996. "Losses, Financing, and Adjustment of State Enterprises in Romania," mimeo, World Bank.

Aghion, Philippe and Patrick Bolton. 1987. "Contracts as a Barrier to Entry," *Amer. Econ. Rev.* 77:3, pp. 388–401.

Aghion, Philippe; Patrick Bolton and Steven Fries. 1999. "Optimal Design of Bank Bailouts: The Case of Transition Economies," *J. Institut. Theoret. Econ.* 155:1, pp. 51–70.

Alfandari, Gilles, Qimiao Fan, and Lev Freinkman. 1996. "Government Financial Transfers to Industrial Enterprises and Restructuring," in *Enterprise Restructuring and Economic Policy in Russia*. Simon Commander, Qimiao Fan and Mark Schaffer, eds. Econ. Development Institute (EDI) Develop. Stud., Washington DC: World Bank, pp. 166–202.

Anderson, James H.; Georges Korsun and Peter Murrell. 2000. "Which Enterprises (Believe They) Have Soft Budgets?—Evidence on the Effects of Ownership and Decentralization in Mongolia," *J. Comp. Econ.* 28:2, pp. 219–46.

Anderson, Lisa. 1995. "Peace and Democracy in the Middle East: The Constraints of Soft Budgets," *J. Int. Affairs* 49:1, pp. 819–32.

Anderson, Ron and Chantal Kegels. 1997. *Transition Banking: The Financial Development of Central and Eastern Europe*. Oxford: Oxford U. Press.

Bagehot, Walter. 1873. Lombard Street: *A Description of the Money Market*. London: H.S. King.

Bai, Chong-en and Yijiang Wang. 1996. "Agency in Project Screening and Termination Decisions: Why Is Good Money Thrown after Bad?" mimeo, U. Minnesota, Minneapolis.

Bain, James A.; Jeffrey B. Miller, James R. Thornton and Michael Keren. 1987. "The Ratchet, Tautness and Managerial Behaviour in Soviet-Type Economies," *Europ. Econ. Rev.* 31:6, pp. 1173–202.

Barro, Robert and David Gordon. 1983. "Rules, Discretion, and Reputation in a Model of Monetary Policy," *J. Monet. Econ.* 12:1, pp. 101–20.

Bartel, Ann P. and Ann E. Harrison. 1999. "Ownership vs Environment: Why Are Public Sector Firms Inefficient?" NBER work. paper 7043, Cambridge, MA: NBER.

Berglöf, Erik and Gerard Roland. 1995. "Bank Restructuring and Soft Budget Constraints in

Financial Transition," *J. Japan. Int. Econ.* 9:2, pp. 354–75.

———. 1998. "Soft Budget Constraints and Banking in Transition Economies," *J. Comp. Econ.* 26:1, pp. 18–40.

Berglöf, Erik and Ernst-Ludwig von Thadden. 1994. "'Short-Term versus Long-Term Interests : Capital Structure with Multiple Investors," *Quart. J. Econ.* 109:4, pp. 1055–84.

Berliner, Joseph S. 1952. *Studies in Soviet History and Society.* Ithaca, NY: Cornell U. Press.

Bertero, Elisabetta and Laura Rondi. 2000. "Financial Pressure and the Behaviour of Public Enterprises under Soft and Hard Budget Constraints: Evidence from Italian Panel Data," *J. Public Econ.* 75:1, pp. 73–98.

——. 2002. "Does a Switch of Budget Regimes Affect Investment and Managerial Discretion of State-Owned Enterprises? Evidence from Italian Firms," *J. Compar. Econ.* 30:4, pp. 836–63.

de Boissieu, Christian; Daniel Cohen and Gael de Pontbriand. 1995. "Russian Enterprises in Transition," CEPR discus. paper: 1174. "

Bolton, Patrick and David Scharfstein. 1996. "Optimal Debt Structure and the Number of Creditors," *J. Polit. Econ.* 104:1, pp. 1–25.

Bonin, John P. and Mark E. Schaffer. 1995. "Banks, Firms, Bad Debts and Bankruptcy in Hungary 1991–94," CEP discus. paper 234, London: Centre Econ. Performance, London School Econ. Polit. Science.

Boycko, Maxim; Andrei Shleifer and Robert Vishny. 1996. "A Theory of Privatisation," *Econ. J.* 106:435, pp.309–19.

Brana, Sophie; Mathilde Maurel and Jerome Sgard. 1999. "Enterprise Adjustment and the Role of Band Credit in Russia: Evidence from a 420 Firms Qualitative Survey," *Comp. Econ. Stud.* 41:4, pp. 47–69.

Bulow, Jeremy, and Kenneth Rogoff. 1989. "Sovereign Debt: Is to Forgive to Forget?" *Amer. Econ. Rev.* 79:1, pp. 43–50.

Brown, David and John Earle. 2000. "Privatization and Enterprise Restructuring in Russia: New Evidence from Panel Data on Industrial Enterprises," work. paper 1, RECEP, Moscow.

Budina, Nina; Harry Garretsen and Eelke de Jong. 2000. "Liquidity Constraints and Investment in Transition Economies—The Case of Bulgaria," *Econ. Transition* 8:2, pp. 453–75.

Carlin, Wendy; Steven Fries, Mark Schaffer and Paul Seabright. 2001. "Competition and Enterprise Performance in Transition Economies: Evidence from a Cross-Country Survey," EBRD work. paper 62.

Claessens, Stijn and Simeon Djankov. 1998. "Politicians and Firms in Seven Central and Eastern European Countries," Policy Research work. paper 1954, World Bank.

Claessens, Stijn and R. Kyle Peters, Jr. 1997. "State Enterprise Performance and Soft Budget Constraints: The Case of Bulgaria," *Econ. Transition* 5:2, pp. 305–22.

Corbett, J. 1987. "International Perspectives on Financing: Evidence from Japan," *Oxford Rev. Econ. Policy* 3:4, pp. 30–55.

Coricelli, Fabrizio and Simeon Djankov. 2001. "Hardened Budgets and Enterprise Restructuring: Theory and an Application to Romania," *J. Compar. Econ.* 29:4, pp. 749–63.

Coricelli, Fabrizio and Gian.-Maria Milesi-Ferretti . 1993. "On the Credibility of 'Big Bang' Programs: A Note on Wage Claims and Soft Budget Constraints in Economies in Transition," *Europ. Econ. Rev.* 37:2–3, pp. 387–95.

Cull, Robert and Lixin Colin Xu. 2000. "Bureaucrats, State Banks, and the Efficiency of Credit Allocation: The Experience of Chinese State-Owned Enterprises," *J. Comp. Econ.* 28:1, pp. 1–31.

Dahlberg, Matz and Per Petterson-Lidblom. 2002. "The Bailout Problem. An Empirical Approach", mimeo, Harvard U.

Debande, Olivier and Guido Friebel. 1995. "Privatization, Employment and Managerial Decision-Taking," mimeo, ECARE, U. Libre de Bruxelles.

Dewatripont, Mathias and Eric Maskin. 1995. "Credit and Efficiency in Centralized and Decentralized Economies," *Rev. Econ. Stud.* 62:4, pp. 541–55.

Dewatripont, Mathias; Eric Maskin and Gerard Roland. 2000 "Soft Budget Constraints and Transition", in *Planning, Shortage and Transformation*. E. Maskin and A. Simonovits, eds. Cambridge: MIT Press.

Dewatripont, Mathias and Gerard Roland. 1997. "Transition as a Process of Large Scale Institutional Change," in *Advances in Economic Theory*. David Kreps and Ken Wallis, eds. Cambridge U. Press, vol. II, pp. 240–78.

——. 2000. "Soft Budget Constraints, Transition and Financial Systems," *J. Inst. Theoret. Econ.* 156:1, pp. 245–60.

Dewatripont, Mathias and Jean Tirole. 1994. "A Theory of Debt and Equity: Diversity of Securities and Manager-Shareholder Congurence," *Quart. J. Econ.* 109:4, pp. 1027–54.

Diamond, Douglas and Philip Dybvig. 1983. "Bank Runs, Deposit Insurance and Liquidity," *J. Polit. Econ.* 91:3, pp. 401–19.

Dittus, Peter S. 1994. "Corporate Governance in Central Europe: the Role of Banks," *Econ. Papers* 42, Bank Int. Settlements.

Djankov, Simeon. 1999. "The Enterprise Isolation Program in Romania," *J. Compar. Econ.* 27:2, pp. 281–93.

Djankov, Simeon and Bernard Hoekman. 2000. "Market Discipline and Corporate Efficiency: Evidence from Bulgaria," *Canadian J. Econ.* 33:1, pp. 190–212.

Djankov, Simeon and Vladimir-Goran Kreacic. 1998. "Restructuring of Manufacturing Firms in Georgia: Four Case Studies and a Survey," ECSPF Occasional Papers Series 1, Washington DC: World Bank.

Djankov, Simeon and Peter Murrell. 2002. "Enterprise Restructuring in Transition: A Quantitative Survey," *J. Econ. Lit.* 40:3, pp. 739–92.

Djankov, Simeon and Tatiana Nenova. 2000. "Why Did Privatization Fail in Kazakhstan?" work. paper, World Bank.

Dobrinsky, Rumen. 1994. "The Problem of Bad Loans and Enterprise Indebtedness in Bulgaria," *MOCT-MOST: Econ. Policy in Transitional Econ.* 4:3, pp. 37–58.

Duggan, Mark G. 2000. "Hospital Ownership and Public Medical Spending," *Quart. J. Econ.* 65:4, pp. 1343–73.

Earle, John S. and Saul Estrin. 1998. "Privatization, Competition, and Budget Constraints: Disciplining Enterprises in Russia," SITE work. paper 128, Stockholm Inst. Transition Econ. and East Europ. Econ.

EBRD. 1998. *Transition Report 1997*. London: EBRD.

———. 1999. *Transition Report 1998*. London: EBRD.

———. 2000. *Transition Report 1999*. London: EBRD.

———. 2001. *Transition Report 2000*. London: EBRD.

Faure-Grimaud, Antoine. 1996. "Soft Budget Constraint and Stock Price Information," FMG discus. papers 251, London School Econ.

Faure-Grimaud, Antoine and Jean-Charles Rochet. 1998. "A Positive Analysis of Bank Privatisation in Transition Economies," mimeo, London School Econ.

Fischer, Stanley. 1980. "Dynamic Inconsistency, Cooperation, and the Benevolent Dissembling Government." *J. Econ. Dynamics Control* 2:1 pp. 93–107.

———. 1999. "On the Need for an International Lender of Last Resort," *J. Econ. Perspect.* 13:4, pp. 85–104.

Freixas, Xavier. 1999. "Optimal Bail Out Policy, Conditionality and Creative Ambiguity", mimeo, UPF.

Freixas, Xavier; Roger Guesnerie and Jean Tirole. 1985. "Planning Under Incomplete Information and the Ratchet Effect," *Rev. Econ. Stud.* 52:2, pp. 173–91.

Freixas, Xavier; B. Parigi and Jean-Charles Rochet. 1998. "The Lender of Last Resort: A Theoretical Foundation," mimeo, IDEI.

Frydman, Roman; Cheryl Gray, Marek Hessel and Andrzej Rapaczynski. 2000. "The Limits of Discipline—Ownership and Hard Budget Constraints in the Transition Economies," *Econ. Transition* 8:3, pp. 577–601.

Frydman, Roman; Marek Hessel and Andrzej Rapaczynski. 2000. "Why Ownership Matters? Entrepreneurship and the Restructuring of Enterprises in Central Europe," work. paper, econ. dept., NYU.

Gao, Shumei and Mark E. Schaffer. 1998. "Financial Discipline in the Enterprise Sector in Transition Countries: How Does China Compare?" CERT discus. paper 1, Centre Econ. Reform and Transformation, Heriott-Watt U., Edinburgh.

Goldfeld, S.M. and R.E. Quandt. 1988. "Budget Constraints, Bailouts and the Firm under Central Planning," *J. Compar. Econ.* 12:4, pp. 502–20.

———. 1990. "Output Targets, the Soft Budget Constraint and the Firm under Central Planning," *J. Econ. Behav. Org.* 14:2, pp. 205–22.

———. 1993. "Uncertainty, Bailouts, and the Kornai Effect," *Econ. Letters* 41:2, pp. 113–19.

Goodfriend, M. and R.G. King. 1988. "Financial Deregulation, Monetary Policy and Central Banking," in *Restructuring Banking and Financial Services in America*. William Haraf and Rose Kushmeider, eds. Washington DC: Amer. Enterprise Institute.

Goodhart, Charles A.E. 1995. *The Central Bank and the Financial System*. Cambridge, MA: MIT Press.

Goodhart, Charles A.E. and Haizhou Huang. 1999. "A Model of the Lender of Last Resort," FMG D.P. 31, London School Econ.

Goodhart, Charles A.E. and Dirk Schoenmaker. 1993. "Institutional Separation between Supervisory and Monetary Agencies," in *The Central Bank and the Financial System*. Charles A. E. Goodhart, ed. Cambridge, MA: MIT Press.

———. 1995. "Should the Functions of Monetary Policy and Bank Supervision Be Separated?" *Oxford Econ. Papers* 39, pp. 75–89.

Grigorian, D. A. 2000. "Ownership and Performance of Lithuanian Enterprises," Policy Research work. paper 2343, World Bank.

Grosfeld , Irena and Gerard Roland. 1996. "Defensive and Strategic Restructuring in Central European Enterprises," *J. Transforming Economies Societies* 3:4, pp. 21–46.

Hart, Oliver. 1995, *Firms, Contracts, and Financial Structure*. Clarendon Lectures, Oxford U. Press, Oxford.

Hart, Oliver and John Moore. 1995. "Debt and Seniority: An Analysis of the Role of Hard Claims in Constraining Management," *Amer. Econ. Rev.* 85:3, pp. 567–85.

Huang, Haizhou and Chenggang Xu.1998. "Boundary of the Firm, Commitment and R&D Financing," mimeo, London School Econ.

———. 1999. "Financial Institutions and the Financial Crisis in East Asia," *Europ. Econ. Rev.* 43:4–6, pp. 903–14.

Humphrey, Thomas. 1989. "The Lender of Last Resort: The Concept in History," *Econ. Review* Federal Reserve Bank of Richmond, 75:2 Mar/Apr. pp.8–16.

Keren, Michael; Jeffrey B. Miller and James R. Thornton. 1983. "The Ratchet: A Dynamic Managerial Incentive Model of the Soviet Enterprise," *J. Compar. Econ.* 7:4, pp. 347–67.

Kornai, János. 1979. "Resource-Constrained Versus Demand-Constrained Systems," *Econometrica* 47:4, pp. 801–19.

———. 1980. *Economics of Shortage*. Amsterdam: North-Holland.

———. 1986. "The Soft Budget Constraint," *Kyklos* 39:1, pp. 3–30.

———. 1992. *The Socialist System. The Political Economy of Communism*. Princeton U. Press and Oxford U. Press.

———. 2001. "Hardening of the Budget Constraint: The Experience of the Post-Socialist Countries," *Europ. Econ. Rev.* 45:9, pp. 1573–600.

Kornai, János and Karen Eggleston. 2001. *Welfare, Choice and Solidarity in Transition: Reforming the*

Health Sector in Eastern Europe. Cambridge, MA: Cambridge U. Press.

Kornai, Janos and Jorgen W. Weibull. 1983. "Paternalism, Buyers' and Sellers' Market," *Math. Social Sci.* 6:2, pp. 153–69.

Krueger, A. 1974. "The Political Economy of the Rent-Seeking Society," *Amer. Econ. Rev.* 6:3, pp. 291–303.

Krugman, Paul. 1998. "What Happened to Asia?" mimeo, MIT.

Kydland, Finn and Edward Prescott. 1977. "Rules Rather than Discretion: The Inconsistency of Optimal Plans," *J. Polit. Econ.* 85:3, pp. 473–91.

Laffont, Jean-Jacques and Jean Tirole. 1988. "The Dynamics of Incentive Contracts," *Econometrica* 56:5, pp. 1153–75.

——. 1993. *A Theory of Incentives in Regulation and Procurement*. Cambridge, MA: MIT Press.

Levaggi, Rosella and Roberto Zanola. 2000. "The Flypaper Effect: Evidence from the Italian National Health System," POLIS dept. work. paper 10, Alessandria, Italy; Dept. Public Policy and Public Choice, U. Eastern Piedmont.

Li, David. 1992. "Public Ownership as a Sufficient Condition for the Soft Budget Constraint," CREST work. paper 93–07, Ann Arbor: U. Michigan Center for Research on Econ. and Social Theory.

Li, David D. and Minsong Liang. 1998. "Causes of the Soft Budget Constraint: Evidence on Three Explanations," *J. Comp. Econ.* 26:1, pp. 104–16.

Litwack, John. 1993. "Coordination, Incentives and the Ratchet Effect," *Rand J. Econ.* 24:2, pp. 271–85.

Lizal, Lubomir; Miroslav Singer and Jan Svejnar. 2001. "Enterprise Breakups and Performance during the Transition from Plan to Market," *Rev. Econ. Statist.* 83:1, pp 92–99.

de Macedo, Jorge Braga. 1990. "External Liberalization with Ambiguous Public Response: The Experience of Portugal," CEPR discus. paper: 378, London: Centre Econ. Policy Research.

Magee, Karen L. and Richard E. Quandt. 1994. "The Kornai Effect with Partial Bailouts and Taxes," *Econ. Planning* 27:1, pp. 27–38.

Majumdar, Sumit K. 1998. "Slack in the State-Owned Enterprise: An Evaluation of the Impact of Soft-Budget Constraints," *Int. J. Ind. Org.* 16:3, pp. 377–94.

Mankiw, Greg N. and Michael D. Whinston. 1986. "Free Entry and Social Inefficiency," *Rand J. Econ.* 17:1, pp. 48–58.

Maskin, Eric S. 1996. "Theories of the Soft Budget-Constraint," *Japan World Econ.* 8:2, pp. 125–33.

——. 1999. "Recent Theoretical Work on the Soft Budget Constraint," *Amer. Econ. Rev.* 89:2, pp. 421–25.

Maskin, Eric and Chenggang Xu. 2001. "Soft Budget Constraint Theories: From Centralization to the Market," *Econ. Transition* 9:1, pp. 1–27.

McMillan, John and Christopher Woodruff. 1999. "Interfirm Relationships and Informal Credit In Vietnam," *Quart. J. Econ.* 114:4, pp. 1285–320.

Mishkin, F. 1995. "Comments on Systemic Risk," in *Banking, Financial Markets and Systemic Risk; Research in Financial Services, Private and Public Policy*, vol. 7. G. Kaufmann, ed. Hampton: JAI Press.

Mitchell, Janet. 1995. "Cancelling, Transferring or Repaying Bad Debt: Cleaning Banks' Balance Sheets in Economies in Transition," mimeo, Cornell U.

——. 1998. "Strategic Creditor Passivity, Regulation and Bank Bailouts," CEPR discus. paper 1780, London: Centre Econ. Policy Research.

——. 2000. "Theories of Soft Budget Constraints and the Analysis of Banking Crises," *Econ. Transition* 8:1, pp. 59–100.

Moesen, Wim and Philippe van Cauwenberge. 2000. "The Status of the Budget Constraint, Federalism and the Relative Size of Government: A Bureaucracy Approach," *Public Choice* 104:3–4, pp. 207–24.

Nett, Lorenz. 1992. "Negative Effects of Competition in a Medical-Service Market," *Econ. Letters* 40:4, pp. 481–85.

North, Douglass C. and Barry R. Weingast. 1989. "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in 17th-Century England," *J. Econ. Hist.* 49:4, pp. 803–32.

Perotti, Enrico. 1993. "Bank Lending in Transition Economies," *J. Bank. Finance* 17:5, pp. 1021–32.

Perotti, Enrico C. and Octavian Carare. 1997. "The Evolution of Bank Credit Quality in Transition—Theory and Evidence from Romania," CERT Discus. paper 2, Edinburgh: Centre for Econ. Reform and Transformation, Heriott-Watt U.

Persson, Torsten and Guido Tabellini. 1990. *Macroeconomic Policy, Credibility and Politics*. Chur, Switzerland: Harwood Academic.

———. 1993. "Designing Institutions for Monetary Stability", *Carnegie-Rochester Conf. Series Public Policy* 39.

Pinto, Brian; Vladimir Drebentsov and Alexander Morozov. 2000. "Give Macroeconomic Stability and Growth in Russia a Chance—Harden Budgets by Eliminating Nonpayments," *Econ. Transition* 8:2, pp. 297–324.

Pohl, Gerhard; Robert E. Anderson, Stijn Claessens and Simeon Djankov. 1997. "Privatization and Restructuring in Central and Eastern Europe—Evidence and Policy Options," World Bank tech. paper 368.

Povel, Paul. 1995. "Multiple Banking as a Commitment not to Rescue," FMG discuss. paper 206, London School Econ.

Qian, Yingyi. 1994. "A Theory of Shortage in Socialist Economies Based on the 'Soft Budget Constraint'," *Amer. Econ. Rev.* 84:1, pp. 145–56.

Qian, Yingyi and Gérard Roland. 1998. "Federalism and Soft Budget Constraint," *Amer. Econ. Rev.* 88:5, pp. 1143–62.

Qian, Yingyi and Chenggang Xu. 1998. "Innovation and Bureaucracy under Soft and Hard Budget Constraints," *Rev. Econ. Stud.* 65:1, pp. 151–64.

Raiser, Martin. 1994. "The No-Exit Economy: Soft Budget Constraints and the Fate of Economic Reforms in Developing Countries," *World Devel.* 22:12, pp. 1851–67.

——. 1996. "Soft Budget Constraints and the Fate of Economic Reforms in Transition Economies and Developing Countries," *Kieler Studien* 281, Tubingen: Mohr Siebeck.

Rochet, Jean-Charles and Jean Tirole. 1996.

"Interbank Lending and Systemic Risk," *J. Money, Credit, Banking* 28:4, pp. 733–62.

Rodden Jonathan; Gunnar S. Eskeland and Jennie Litvack, eds. 2002. *Fiscal Decentralization and the Challenge of Hard Budget Constraints.* MIT Press.

Rogoff, Kenneth. 1985. "The Optimal Degree of Commitment to an Intermediate Monetary Target," *Quart. J. Econ.* 100:4, pp. 1169–90.

Roland, Gérard. 2000. *Transition and Economics: Politics, Markets, and Firms.* Cambridge, MA and London: MIT Press.

Roland, Gérard and Khalid Sekkat. 2000. "Managerial Career Concerns, Privatization and Restructuring in Transition Economies," *Europ. Econ. Rev.* 44:10, pp. 1857–1872.

Roland, Gérard and Ariane Szafarz. 1990. "The Ratchet Effect and the Planner's Expectations", *Europ. Econ. Rev.* 34:5, pp. 1079–88.

Santomero, Anthony M. and Paul Hoffman. 1998. "Problem Bank Resolution: Evaluating the Options," in *International Banking Crises: Large-Scale Failures, Massive Government Interventions.* Benton E. Gup, ed. Greenwood Publishing 1999.

Schaffer, M.E. 1989. "The Credible-Commitment Problem in the Center–Enterprise Relationship," *J. Compar. Econ.* 13:3, pp. 359–82.

Schaffer, Mark E. 1998. "Do Firms in Transition Have Soft Budget Constraints?—A Reconsideration of Concepts and Evidence," *J. Comp. Econ.* 26:1, pp. 80–103.

Schmidt, Klaus and Monika Schnitzer. 1993. "Privatization and Management Incentives in the Transition Period in Eastern Europe," *J. Compar. Econ.* 17:2, pp. 264–87.

Schnitzer, Monika. 1999. "Enterprise Restructuring and Bank Competition in Transition Economies," *Econ. Transition* 7:1, pp. 133–55.

Schumpeter, J. A. 1911. *Theorie der Wirtschaftlichen Entwicklung. The Theory of Economic Development. Leipzig: Duncker&Humbolt.* 1912. Trans. by R Opie as *An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle.* Cambridge, MA: Harvard U. Press 1934. Reprint NY: Oxford U. Press, 1961.

Schwartz, A. 1995. "Systemic Risk and the Macroeconomy," in *Banking, Financial Markets and Systemic Risk; Research in Financial Services, Private and Public Policy*, vol. 7. G. Kaufmaan, ed. Hampton: JAI Press.

Selten, Reinhard. 1965. "Spieltheoretische Behandlung eines Oligopolmodelles mit Nachfrageträgheit" *Zeitschrift für die Gesamte Staatswissenschaft,"* 121, pp. 301–24.

Shleifer, Andrei and Daniel Treisman. 2000. *Without a Map: Political Tactics and Economic Reform in Russia.* Cambridge, MA: MIT Press.

Shleifer, Andrei and Robert W. Vishny. 1994. "Politicians and Firms," *Quart. J. Econ.* 109:4, pp. 995–1025.

Segal, Ilya R. 1998. "Monopoly and Soft Budget Constraint," *Rand J. Econ.* 29:3, pp. 596–609.

Sjöberg, Örjan and Zhang Gang. 1996. "Soft Budget Constraints: An Analysis Based on a Survey of Chinese Township Enterprises," work. paper series econ. and finance 93, Econ. Research Institute, Stockholm School Econ.

Skoog, Gun Eriksson. 2000. *The Soft Budget Constraint—The Emergence, Persistence and Logic of an Institution.* Dordrecht: Kluwer Academic.

von Thadden, Ernest-Ludwig. 1995. "Long-Term Contracts, Short-Term Investment and Monitoring," *Rev. Econ. Stud.* 62, pp. 557–75.

Thornton, Henry. 1802. *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain.*

Tornell, Aaron. 1999. "Privatizing the Privatized," NBER work. paper 7206, Cambridge, MA: NBER.

Tóth, I.J. 1998. "A vállalatok pénzügyi fegyelme és növekedési képessége az átalakuló gazdaságban (Firms' Financial Discipline and Capability of Growth in a Transforming Economy)," *Közgazdasági Szemle* 45:12, pp. 1126–40.

Wang, Yijiang. 1991. "Economic Reform, Fixed Capital Investment Expansion and Inflation: A Behaviour Model Based on the Chinese Experience," *China Econ. Rev.* 2:1, pp. 3–27.

Weitzman, Martin. 1980. "The Ratchet Principle and Performance Incentives," *Bell J. Econ.* 11:1, pp. 302–308.

Wildasin, D.E. 1997. "Externalities and Bailouts: Hard and Soft Budget Constraints in Intergovernmental Fiscal Relations," World Bank Policy Research work. paper 1843, Washington DC: World Bank.

Williamson, Oliver. 1975. *Markets and Hierarchies: Analysis and Antitrust Implications.* NY: Free Press.

World Bank. 1997. *From Plan to Market: World Development Report 1996.* Oxford: Oxford U. Press.

——. 1999. *Annual Bank Conference on Development Economics 1998.* Boris Pleskovic and Nicolas Stern, eds. Washington DC: World Bank.

——. 2002. *Transition, First Ten Years: Analysis and Lessons for Eastern Europe and the Former Soviet Union.* Washington DC: World Bank

Zinnes, Clifford; Yair Eliat and Jeffrey Sachs. 2001. "The Gains from Privatization in Transition Economies: Is 'Change of Ownership' Enough?" IMF Staff Papers vol. 48 Special Issue.