



NORTH-HOLLAND

Journal of Asian Economics 13 (2002) 297–318

**JOURNAL
OF
ASIAN ECONOMICS**

Asian finance and the role of bankruptcy: a model of the transition costs of financial liberalization[☆]

Thomas F. Cargill, Elliott Parker^{*}

*Department of Economics/030, College of Business Administration,
University of Nevada, Reno, NV 89557-0207, USA*

Received 18 July 2001; received in revised form 15 January 2002; accepted 1 March 2002

Abstract

The degree to which bankruptcy is permitted to play a role in the allocation of capital is a key distinction of the state-directed financial regime of Japan, South Korea, and many other Asian economies. Focusing on the development and characteristics of the Japanese main-bank system and comparing it to the Anglo-American approach, this paper discusses the two approaches to finance and argues that a major problem with the bank-finance model used in many Asian countries is its minimization of bankruptcy risks. A three-sector development model is described and simulated to compare the outcomes of the two approaches separately and then to evaluate the transition costs of switching from a state-directed to a market-directed financial regime. The simulation results suggest that the market approach results in a higher long-run growth path because it eliminates inefficient firms through bankruptcy. The results also suggest that switching from a state-directed to a market-directed model can be very costly to the economy. These transition costs can be lowered by a phased-in liberalization but are increased by delay. We then discuss the policy implications. © 2002 Elsevier Science Inc. All rights reserved.

JEL classification: O4; P5

Keywords: Financial liberalization; Japanese main-bank system; Creative destruction

[☆] An earlier version of this paper was presented at the University of California, Davis, on May 10, 2001 and at the West Coast Japan Economic Seminar, June 2, 2001 University of California, Santa Cruz, and included in the Pacific Basin Working Paper Series (PB01-01) by the Federal Reserve Bank of San Francisco.

^{*} Corresponding author. Tel.: +1-775-784-6408; fax: +1-775-784-4728.

E-mail address: eparker@unr.edu (E. Parker).

1. Introduction

The accumulation of non-performing bank loans has been a prominent explanation for the sustained slowdown of the Japanese economy during the 1990s and the more dramatic Asian financial crisis that occurred in 1997.¹ Some have pointed to financial liberalization as the ultimate cause of the crisis, while others have argued that liberalization was too little and too late. Particular attention has been focused on the interconnections between firms, banks, and the state, commonly referred to as “crony capitalism,” that became pervasive under the main-bank system common to Japan and a number of other Asian countries. The fundamental criticisms of this state-directed system of capital allocation are that it creates a moral hazard problem and induces banks to lend to firms for projects with lower expected returns or higher risk; thus, it allows both insolvent firms and banks to continue to operate, draining potentially-productive resources from the rest of the economy.

Financial liberalization in many Asian countries has been slow and incomplete and by the end of the 1990s, many elements of the old financial regimes remained in place despite many years of official liberalization policy. Liberalization policy in Japan and elsewhere weakened the close relationship between banks and firms and provided alternatives to bank-finance; however, despite many years of liberalization, the bank–firm relationship remains significant in many Asian financial regimes (Ostrom, 2000; Spiegel & Yamori, 2001). State-directed flow of funds, pervasive deposit guarantees, mutual support, bank-finance, and an emphasis on limiting risk and bankruptcy continue to play a prominent role. As a result, the slow pace of liberalization rendered South Korea, Japan, and a number of other Asian countries susceptible to foreign exchange and bank failure stocks in the 1990s that eventually led to general economic and financial instability in Asia in 1997 and 1998.

A key objective of the bank–firm relationship in many Asian state-directed financial systems is to limit risk for firms, or minimize bankruptcy through implicit subsidization.² In contrast, financial regimes which follow the Anglo-American approach (i.e., that established by the United Kingdom and the United States) tend to accept risk and bankruptcy as an important part of the capital allocation process, necessary both to protect the property rights of creditors and to provide more efficient incentives to managers, owners, and lenders. This paper presents a model to investigate the effects of limiting bankruptcy in the real sector and allocating capital based on bank–firm relationships designed to limit risk and bankruptcy.³ The model focuses on the selective effect that bankruptcy has on the distribution of technological progress, rather than the incentive effect it has on managerial performance. Simulations of the model reveal policy implications for the design of financial structures and the problems of financial liberalization.

The results demonstrate that Asian state-directed financial regimes like those of Japan and South Korea possess a time-inconsistency problem. These regimes, which may achieve high growth in the short run by preventing bankruptcy, are unable to sustain it in the long-run because of the cumulative effects of inefficient surviving investments. More market-oriented financial regimes (i.e., the Anglo-American regime), in contrast, offer higher long-run sustainable growth because they permit bankruptcy, thereby eliminating inefficient firms in the long-run and reducing the dead-weight loss on long-run growth. But the results also

demonstrate the potential for high transaction costs associated with shifting from a state-directed to a market-directed financial system.

This analysis is consistent with Krugman's (1994) argument that the "Asian Miracle" of rapid economic growth in the 1980s was the result of a particular set of unsustainable circumstances. Specifically, rapid growth was extensive rather than intensive. It resulted from rapid capital growth supported by high savings,⁴ which eventually meets with diminishing returns, and the one-time shift of labor from low-productivity to high-productivity sectors (i.e., from subsistence agriculture to export manufacturing), rather than from more sustainable improvements in efficiency and technology within sectors. Thus, it was only a matter of time before economic growth slowed in many of these Asian countries.

But why is technological progress not likely to offset diminishing returns, as it usually seems to do in countries, which adopted the Anglo-American approach? We argue that the problem resides in the particular approach to finance adopted by many Asian countries, an approach that is more or less based on Japan's financial system. In particular, the bank-firm relationship and its emphasis on limiting bankruptcy contribute to an understanding of why technological progress may not be able to offset diminishing returns over time, and the longer a country relies on the bank-finance model and its limited bankruptcy the higher the transactions cost of switching to a more market-oriented regime.

The remainder of the paper is organized into five sections. In Section 2, we compare and contrast market and state-directed financial regimes, explore the role of Japanese finance as the model for many Asian financial regimes, and describe how these Asian state-directed financial regimes in general responded to financial liberalization. In Section 3 we discuss the role of bankruptcy in both market- and state-directed financial regimes, particularly in the real sector. We then present a simple model in Section 4, in which we try to demonstrate the importance and the perils of financial liberalization in such a regime. In this model, individual entrepreneurs may shift from the agricultural sector to manufacturing, forming small but heterogeneous firms that are subject to random productivity shocks and must compete for capital with other firms. The simulation results are presented in Section 5, along with an examination of some alternative strategies for financial liberalization. Finally, the policy implications and concluding comments are presented in Section 6.

2. Financial liberalization and the Japanese financial regime

State-directed financial systems in Japan, South Korea, and a number of other Asian economies were organized on fundamentally different principles than economies using the Anglo-American approach prior to the start of liberalization in the late 1970s, despite the fact that both systems, to varying degrees, limited the role of market forces in allocating funds. In the pre-liberalization period, Anglo-American financial systems adopted a market perspective in which transactions were short-term and defined by price and quantity. Government influence through interest rates, portfolio diversification, and credit allocation regulations played a significant role; however, the major part of the flow of funds was market sensitive. The financial system was permitted to respond to all demands for credit, as it was viewed as a service industry to consumers and business firms. Anglo-American financial

systems operated with a high degree of transparency and financial disclosure. Most important, these financial systems operated on the principle that rational credit evaluation and monitoring would result in bankruptcy among borrowers.

Thus, even prior to liberalization the Anglo-American financial regime incorporated Schumpeter's concept of "creative destruction." Caballero and Hammour (2000, p. 27) argue that the Schumpeterian process, which is characterized by "massive ongoing restructuring and factor reallocation by which new technologies replace the old," is one of the core mechanisms of the market economy. "Unfortunately," they note, "the process of creative destruction is also fragile, as it is exposed to political short-sightedness, inadequate contractual environments, and financial underdevelopment."

The major objective of market-based financial systems in developed economies was to evaluate and monitor credit, even prior to financial liberalization, though this was hampered to some extent by government regulation in the form of credit allocation, interest rate ceilings on deposits and lending, and limiting competition between various components of the financial system. Government regulation and the central bank's role as lender of last resort limited bankruptcy among financial institutions and markets to prevent contagion, but nonetheless, government regulation at least in principle, allowed for an orderly exit policy in both the financial and real sectors for institutions that were no longer viable.

In contrast, many Asian financial systems adopted a "customer relationship" perspective emphasizing long-term multidimensional relationships that often resulted in credit allocation, evaluation, and monitoring that could not always be rationalized by economic analysis. A major objective was to prevent bankruptcy among the most important firms in the economy through a system of mutual support among financial institutions, business firms, and politicians. While the bank–firm relationship was designed to limit risk and bankruptcy, the entire focus of financial regulation and supervision was designed to support a financial regime that limited risk and bankruptcy.

Creative destruction played no significant role in these Asian financial systems. Financial systems were regarded as part of an overall policy of industrialization and were designed to encourage high saving rates, limit the household sector's access to consumer and mortgage credit, and international isolation. While market forces were not absent, government regulation in the form of interest rate controls and credit allocation were pervasive. The system was characterized by non-transparency to assist in limiting bankruptcy and enhance the mutual support nature of the system. As Kane (2000) argues, disinformation was used to cover up the costs of politically-directed lending, with the inevitable loss of credibility acting as a potential trigger for silent bank runs and financial crisis.

The bank–firm relationship and limited alternatives for raising capital support other core elements of the state-directed financial regime, such as non-transparency. There exists a feedback relationship between bank-finance and open money and capital markets in Asian state-directed financial regimes. The bank–firm relationship constrains the development of open money and capital markets, which in turn makes it difficult to reduce the bank–firm relationship.⁵ Lincoln (2000) argues in the case of Japan, and by implication other Asian countries, certain cultural and social characteristics support reliance on bank-finance and hence, limit development of open money and capital markets. Success in reducing the bank–firm relationship will require expanding non-bank methods of raising capital in a more

transparent manner that permits a greater willingness to accept bankruptcy as a penalty for poor decision-making.

2.1. *The Japanese financial model*

These principles were most clearly reflected in the Japanese financial regime, which in varying degrees served as a model for the majority of Asian financial systems. Japan's occupation of many Asian countries starting with the colonization of Korea in 1908, Japan's occupation of part of China in the 1930s, and Japan's occupation of many Asian countries during World War II, introduced Japanese economic and financial institutions throughout Asia.⁶ Prior to Japan's expansion into the Pacific Basin, Asian countries lacked developed financial systems and thus a vacuum existed that made it relatively easy to establish Japanese financial structures despite the less-than-friendly occupation.

In the post-war period, many Asian countries maintained these institutions and further modeled their financial systems after Japan to emulate Japan's rapid growth, macroeconomic stability, and emergence as the second largest economy in the world. The rapid re-industrialization of Japan was impressive by any standard and much of the credit for rapid and stable economic growth was attributed to Japan's financial institutions.⁷ In particular, the *keiretsu* main-bank system set up a convoy system of risk sharing, and close links to firms led banks to over-lend to firms with poor investment opportunities (Reeb & Kwok, 2000). Cargill, Hutchison and Ito (1997, 2000) provide a detailed discussion of Japanese financial markets and institutions for the post-war period, Cargill (1998) discusses how the Japanese financial system influenced developments in South Korea, and Cargill and Parker (2001) discuss the influence of Japan's financial system on the Chinese financial regime.

2.2. *The response to liberalization*

Financial liberalization became an ongoing process in the late 1970s in many developed and developing countries when a new economic, technological, and political environment emerged that conflicted with the existing financial structure, and the impact on economic growth was generally positive and significant (Bekaert, Harvey & Lundblad, 2001). However, the degree, pace, and policy commitment to financial liberalization differed widely across countries. Market-oriented financial systems like that of the United States were more susceptible to financial liberalization for three reasons. Anglo-American financial systems had evolved to rely on market principles, since significant competition already existed in many sectors of the financial system, and government regulation and supervision was not pervasive. In fact, Anglo-American economic institutions in general were more compatible with market principles; bankruptcy was an accepted business outcome, for example, and the concept of creative destruction was generally accepted as a by-product of the growth process. Furthermore, the existence of active money and capital markets and few restrictions on the inflow and outflow of capital constrained the ability of the government to regulate other components of the financial system.

Asian state-directed financial systems were generally much less accommodative to financial liberalization. The systems were based on mutual support, non-transparency, and

limited competition supported by the bank-finance model. Though financial liberalization significantly improves bank performance (Reynolds, Ratanakomut & Gander, 2000), the lack of open money and capital markets combined with extensive restrictions on the inflow and outflow of capital rendered binding government portfolio regulations more difficult to circumvent and reinforced the bank–firm relationship.

The Asian financial crisis that began in 1997, following 7 years of economic and financial distress in Japan, represented a turning point of sorts for Asian financial systems. The near-collapse of the South Korean and Japanese financial systems in late 1997 demonstrated that the old financial regimes based on mutual support and non-transparency were incompatible with the new environment. Since 1997, Asian countries made progress toward restructuring both the financial and corporate sectors and have made improvements in prudential regulation and supervision (Kawai, 2000). It is too early to determine whether the process will continue and whether a convergence between western and Asian financial regimes will occur. In particular, the bank–firm relationship remains an important characteristic of Asian finance, and thus while bankruptcy rates have increased significantly in the last part of the 1990s, it is still not clear that Asian regulatory authorities are willing to permit the degree of bankruptcy that exists in market-oriented financial regimes. This may especially be the case in the majority of Asian countries that recovered fairly rapidly in 1999 and 2000. Rapid recovery reduces the incentives for making the transition to a more market and open competitive financial system. Japan presents a different problem. Japan's economic recovery was much weaker in 1999 and 2000, and by October 2000, Japan had again shifted into recession. In late 2001, there was increasing concern about Japan's prospects for recovery, which makes further restructuring more difficult.

Overall, the Asian financial crisis highlighted the problems of the bank–firm model and emphasis on limiting bankruptcy, but development of open money and capital markets will remain a slow and gradual process in Asian countries.

3. The role of bankruptcy

In this paper, we treat bankruptcy as synonymous with firm liquidation, but bankruptcy is also a complex legal process often intended to encourage workout and prevent liquidation of a firm's assets by protecting it from creditors. In the absence of technological spillovers, a poorly-performing firm might best continue operating, once existing owners and creditors are forced to write off their losses and managers are replaced. Bankruptcy is often forced on still potentially-productive firms by creditors given higher priority as a way of enforcing debt contracts; Cornelli and Felli (1997) argue that this absolute priority rule may conflict with efficient bankruptcy, while Hart, La Porta Drago, Lopez-de-Silanes and Moore (1997) suggest a multiple auction procedure to better optimize bankruptcy procedures.⁸

Baird (1998) argues that legal views towards bankruptcy can be divided into two distinct camps, traditionalists and proceduralists, the former camp stressing the goal of protecting the firm from its creditors to allow re-organization, and the latter camp focusing on the incentive effects, as often one of the only ways of enforcing managerial discipline. Similarly, the

economic views can be divided into liquidationists, who in the extreme case advocate recessions as a means to weed out inefficient producers, and those who believe that firm liquidation is almost always harmful to the economy (Caballero & Hammour, 1999). Li and Li (1999) argue for an additional benefit, that bankruptcy laws force managers to reveal information to both the owners and creditors.

The role of bankruptcy differed significantly between market-oriented and state-directed systems prior to the start of financial liberalization. Bankruptcy and the process of “creative destruction” were accepted in many western countries and regarded as a normal process of economic growth. In this regard, the financial system played an important role by evaluating and monitoring credit. In contrast, state-directed financial systems were designed to limit and in many cases, prevent bankruptcy among firms. This is the foundation of the “main-bank” system in Japan, which was copied in various forms throughout Asia.

Cargill and Royama (1988) attempted to characterize this relationship with flow-of-funds data for Japan and the United States to highlight the difference between market-oriented and state-directed financial systems. They found a fundamental difference between Japanese and U.S. finance: negotiable indirect financial transactions dominated the flow of funds in Japan, while open market direct financial transactions dominated the flow of funds in the United States. In a detailed study of six other Asian economies and their policies after the financial crisis, Hussain and Wihlborg (1999) concluded that bank behavior, especially towards firm in default, was the primary determinant of the length and depth of recessions.

4. A model of capital allocation and the effects of bankruptcy

What effects do bankruptcy and the method of capital allocation have on an economy’s growth? We address this question by describing and simulating a model of economic development that incorporates the two approaches to bankruptcy—the state-directed regime that prevents bankruptcy and the market-directed regime that permits bankruptcy. We then use this model to consider the problems that might be associated with financial liberalization.

The model developed in this paper expands on that developed by Parker (1995), but the model developed here differs in several ways. First, the previous model did not incorporate a financial sector, while this model is expanded to include a financial regime based on bank-finance and models the interaction between banks and firms. Second, the earlier paper did not include prices, and thus did not consider the interactive effects of one firm’s bankruptcy on another; in this model, both wages and interest rates are market-determined, and so when one firm goes bankrupt the resulting output loss results in a reduction of savings that affects other firms. Third, bankruptcy was treated as an exogenous variable in the earlier model, while we treat the shutdown decision as endogenous.

The model assumes both state- and market-directed regimes rely on bank-finance, but differentiates between the two with regard to whether bankruptcy is prevented or permitted. Finally, this model considers the problem of switching, from a state-directed to a market-directed financial regime. We illustrate our arguments comparing financial lending policies with a simulation of a three-sector developing economy comparing two alternative growth

paths based on the two methods of capital allocation, and then extend this comparison by considering the problems of switching from the state-directed method to the market-directed method in mid-simulation.

4.1. The three-sector economy

The model begins with a hypothetical economy producing only agricultural products. As a result of savings and capital accumulation, entry and exit, the economy transforms itself into a diversified economy with both agriculture and manufacturing. Thus there are two real sectors, agriculture and manufacturing, and a third financial sector primarily on bank-finance.

We assume that the labor force is constant, and the labor force (L) equals the sum of farmers (F) and manufacturing workers (M):

$$L = F_t + M_t, \quad (1)$$

where in the initial state $F_0 = L$ (initially, everyone is a farmer). Output of agricultural goods (Q_t^A) is a simple Cobb–Douglas function of the number of farmers and a constant amount of land A :

$$Q_t^A = F_t^\alpha A^{1-\alpha}, \quad (2)$$

where $0 < \alpha < 1$. Thus, we assume for simplicity agriculture exhibits zero technological progress and diminishing marginal product of labor, and all farms are identical in the aggregate. The wage paid to each farmer is equal to the marginal product, so:

$$W_t^A = \alpha \left(\frac{A}{F_t} \right)^{1-\alpha}. \quad (3)$$

The manufacturing sector consists of individual small firms with varied technologies. Unlike in agriculture, manufacturing output (Q_t^M) cannot be so easily aggregated. Instead, it is equal to the sum of each firm's production:

$$Q_t^M = \sum_{i=1}^M q_{it} = \sum_{i=1}^M (\tau_{it} k_{it}^\beta m_{it}^{1-\beta}), \quad (4)$$

where q_{it} represents the output of the i th firm at time t , τ represents its technological level, k is its capital stock, m is its number of workers, $0 < \beta < 1$, and β is constant across firms. By allowing τ to vary among firms, we are allowing for heterogeneous firms. This is not consistent with the assumption that all firms have access to an identical technology; instead, firms may be producing heterogeneous products, using inputs with varying qualities that are not captured by Ricardian rents, or engaging in a continuous process of innovation in production technology and managerial methods.

Because the firm's Cobb–Douglas technology exhibits constant returns to scale, it is *a priori* impossible to determine the optimal number of firms. Thus, to provide a solution that allows for firm variation we assume that each firm employs one worker/manager/entrepreneur, so that $m = 1$ and the aggregate number of manufacturing workers equals the

number of firms. The income of each manufacturer is:

$$W_{it}^M = \tau_{it} k_{it}^\beta - R_t k_{it}, \quad (5)$$

where R_t is the rental rate of capital, equal to the depreciation rate (δ) plus the market interest rate. We assume that technology is firm-specific; new firms enter with access to the average technology currently available, but existing firms innovate new methods that alter their technology for better or worse. We also assume that the result of innovation is random, so that:

$$\tau_{it} = \tau_{it-1} e^{\varepsilon_{it}}, \quad (6)$$

with the random errors ε_{it} distributed normally, with mean μ and variance σ^2 . We next assume that the relative price of agricultural to manufactured goods is constant, perhaps as a result of trade with the outside world, and so aggregate output in this economy equals:

$$Y_t = Q_t^A + Q_t^M, \quad (7)$$

where gross savings (including any household and firm savings as well as depreciation allowances) is a constant fraction of income:

$$S_t = \zeta Y_t. \quad (8)$$

Entry occurs when farmers expect that manufacturing is more profitable, and they leave farming to compete for capital. Farming is assumed to pay its workers their marginal product, so as the number of farmers declines, agricultural wages must increase with predictable certainty. Their future income from becoming manufacturers, however, is not known with certainty. To make this problem tractable, we assume farmers simply form expectations about their potential manufacturing income as:

$$E(W_{t+1}^M) = \frac{E(\tau_t) E(K_{t+1})^\beta E(M_{t+1})^{1-\beta} - E(R_{t+1}) E(K_{t+1})}{E(M_{t+1})}. \quad (9)$$

The expected manufacturing wage is thus the expected value of output, less capital costs, per manufacturer. We solve for $E(\tau)$ as the current output-weighted level of technology, and the expected capital stock as:

$$E(K_{t+1}) = \left(\sum_{i=1}^M k_{it} \right) (1 - \delta) + S_t. \quad (10)$$

The capital stock of existing firms is assumed to depreciate at the annual rate δ . The expected return to capital is calculated as the marginal product of capital for the aggregate manufacturing sector, assuming identical technologies across firms in order to aggregate the production function, so that:

$$E(R_{t+1}) = \beta E(\tau_t) \left(\frac{E(M_{t+1})}{E(K_{t+1})} \right)^{1-\beta}. \quad (11)$$

Finally, $E(M_{t+1})$ is found through a Walrasian tatonnement process by beginning with the existing number of firms, solving for both the agricultural wage and the expected

manufacturing wage for that particular amount of M , and then repeating the process as long as:

$$E(W_{t+1}^M) > W_{t+1}^A(1 + \Omega), \quad \text{where} \quad W_{t+1}^A = \alpha \left(\frac{A}{L - E(M_{t+1})} \right)^{1-\alpha}. \quad (12)$$

We thus assume there is some small adjustment cost to entry and exit, equal to a fraction Ω of the agricultural wage.⁹

4.2. The allocation of capital

Using the model just described, we compare two basic strategies of capital allocation:

- (1) A “state-directed” strategy, which we believe reasonably, if somewhat simplistically, approximates the state-directed banking approach used by Japan, South Korea, and a number of other Asian economies. New firms may enter the manufacturing sector with a purchase of capital equal to the previous period’s per-capita income. Savings (less that used for new firm start-ups) are allocated to existing firms based on their previous period’s share of output, a policy that favors established firms but also rewards those firms with better technology. Since capital is not allocated in a market process, rental rates for capital are assumed to be firm-specific, and equal to the firm’s marginal product of capital. Unprofitable firms or firms with low marginal product of capital are not shut down; instead, implicit subsidies make it possible for them to continue operating.
- (2) A “market-directed” strategy that approximates the Anglo-American approach to banking. Existing firms are allocated capital according to their expected marginal product. We limit new firm lending to the previous period’s per-capita income, we do not allow lending to more than double a firm’s capital stock in any one period, and we do not allow lending to firms that are currently unprofitable.

In the market model, because firm-specific technology prevents a direct solution, we simulate a Walrasian tatonnement process to find the rental rate that clears the market: beginning with the expected return to capital calculated in Eq. (11), the rental rate is arbitrarily raised by 50 basis points and then dropped in one basis point increments until the demand for additional capital (defined as the firm’s optimal level of capital less the firm’s existing depreciation-adjusted capital stock), summed over all firms, ceases to exceed the supply of savings.

In the market model too, banks are assumed to force bankruptcy on unprofitable firms; since rational producers would choose to exit given long-run prospects for negative profits, this implies that banks do not subsidize these firms. Since we assume there is a transaction cost for exit, at the end of each period we shut down all firms for which:

$$\tau_{it} k_{it}^{\beta} - R_t k_{it} < W_t^A (1 - \Omega). \quad (13)$$

By using a cash flow measure rather than a comparison of the company’s assets to liabilities, we are implicitly assuming that current firm profits, which depend in large part of the firm’s level of technology, are the best predictor under uncertainty of the firm’s future profits. When a firm is shut down, its worker returns to agriculture. Some fraction ζ of its capital

stock is assumed to be salvageable; the remaining $(1 - \zeta)$ portion of its capital stock is lost to the bank and to society.

How would the financial sector be affected by these strategies? We model the cash flow of the financial sector by assuming that firms repay the principal of their loans at the rate of depreciation, and these depreciation allowances are included in national savings. Banks earn interest equal to the previous period's capital stock times the difference between the rental rate and the depreciation rate. Banks lend out all additions to savings, but must write off as a bad debt expense the value of any bankrupt firm's lost capital stock, current interest and principal repayment.

4.3. Simulation and initial results

How do the state-directed and market strategies compare? We use a single set of parameters and a single set of random error terms for illustrative purposes. In the agricultural sector, we set $L = 1000$, $A = 1000$, and $\alpha = 0.50$, so labor and land have equal output elasticities and initially make equal contributions to output. The technology parameters (τ_{i1}) of new manufacturing firms are initially set to 1, though later entrants will enter at the mean rate and be able to take advantage of technological progress. Random error terms (50 periods \times 1000 potential firms = 50,000 terms) are generated using the normal distribution, with $\mu = 0$ and $\sigma = 0.04$, so there is no inherent tendency for manufacturing technology to improve relative to agriculture technology except through selection. The output elasticity for capital (β) is 0.75 for all firms. The savings rate (ζ) is 15%, the depreciation rate (δ) is 10%, the salvage rate (ζ) is 20%, and the transaction cost (Ω) for entry and exit, as a share of the wage, is set to 30%.

Table 1
A comparison of state-directed and market strategies

Period	<i>M</i>	<i>T</i>	<i>C</i>	<i>K</i>	BCF	<i>W</i>	<i>R</i>	XR (%)	NER (%)	PR (%)	RA	RXA
State-directed capital allocation strategy												
1	40	0.999	924	150	66	0.510	0.538	0	4	100	1.00	0.00
25	566	1.120	2319	3057	1246	0.759	0.524	0	1	47	0.62	0.00
50	765	1.252	3518	5380	2203	1.031	0.490	0	1	40	0.68	0.00
<i>Mean</i>	<i>518</i>	<i>1.123</i>	<i>2303</i>	<i>3001</i>	<i>1222</i>	<i>0.768</i>	<i>0.529</i>	<i>0</i>	<i>2</i>	<i>43</i>	<i>0.64</i>	<i>0.00</i>
<i>Growth 0–50</i>	<i>6.2%</i>	<i>0.5%</i>	<i>2.9%</i>	<i>7.6%</i>		<i>1.5%</i>	<i>–0.2%</i>					
<i>Growth 40–50</i>	<i>0.8%</i>	<i>0.4%</i>	<i>1.4%</i>	<i>1.8%</i>		<i>1.1%</i>	<i>–0.1%</i>					
Market capital allocation strategy												
1	40	0.999	924	150	66	0.510	0.539	0	4	93	1.00	0.00
25	615	1.332	2681	2859	1502	0.806	0.669	3	2	69	0.34	0.53
50	903	1.802	6553	7054	4509	1.605	0.788	6	1	66	0.23	0.24
<i>Mean</i>	<i>578</i>	<i>1.355</i>	<i>3068</i>	<i>3170</i>	<i>1782</i>	<i>0.896</i>	<i>0.661</i>	<i>3</i>	<i>2</i>	<i>70</i>	<i>0.39</i>	<i>0.44</i>
<i>Growth 0–50</i>	<i>6.6%</i>	<i>1.2%</i>	<i>4.2%</i>	<i>8.2%</i>		<i>2.4%</i>	<i>0.8%</i>					
<i>Growth 40–50</i>	<i>1.0%</i>	<i>1.3%</i>	<i>3.8%</i>	<i>3.6%</i>		<i>3.2%</i>	<i>0.6%</i>					

Note: Simulation results are shown for the number of manufacturers (*M*), the output-weighted average technology (*T*), the amount of consumption expenditures (*C*), the capital stock (*K*), the financial sector's cash flow (BCF), the wage rate (*W*), the rental rate of capital (*R*), the exit rate (XR) as a percentage of the population, the net entry rate (NER) as a percentage of the population, the profitability rate (PR) as a percentage of manufacturing firms, the relative average age of firms (RA) as a fraction of the age of the oldest firm, and the relative average age of exiting firms (RXA). Annualized growth rates are given for *M*, *T*, *C*, *K*, *W*, and *R*; period 1 is substituted for period 0 for *M*, *K*, and *R*, since these data were equal to 0 in the initial agricultural economy.

Table 1 shows values for major variables for 3 years in the sample (1, 25, and 50) as well as the overall mean, for both the state-directed and market-directed approaches. In our simulation, the market approach to capital allocation results in faster technological progress due to greater selection pressure, while the state-directed approach leads to initially faster capital accumulation. This is the same result obtained by [Parker \(1995\)](#); however, the current model with a financial sector and endogenous bankruptcy provides a greater degree of robustness to the result and provides insight into how bankruptcy changes over time. Exit rates grow slowly as the dispersion of technology grows (though the net entry rate is still positive), and as a result the state-directed approach never results in higher consumption than the market approach, even initially. Relative to the oldest firm, the average age of firms is higher under the state-directed approach, and exiting firms are older on average than the survivors.

Technology does improve much faster in the market approach, but it is not entirely stagnant in the state-directed approach since firms with better technology produce more output and thus receive more capital, and the average technology used by new entrants is weighted by output. Because the market approach leads to higher output, it also enables the economy to generate more capital even as bankruptcy destroys it, and net bank cash flow is higher.

In both the market- and state-directed approaches, we see a transformation from an agricultural economy to an agricultural-manufacturing economy; however, the transformation is more rapid with the market approach. In both market- and state-directed approaches, wages rise as technology improves and capital is accumulated, with wages rising faster in the market approach. While the average return to capital falls over time in the state-directed approach, it rises in the market approach. Finally, what is most striking about **Table 1** can be seen by a comparison of some average growth rates, over all 50 periods versus the last 10 periods. Growth rates for technology and wages slow in the state-directed approach but accelerate in the market approach, while growth in the number of firms, consumption, and capital stock slow dramatically in the state-directed approach but not in the market approach.

5. Financial liberalization and switching methods

In the above simulation, the advantages of a market approach become more apparent over time. What if policymakers who have already chosen the state-directed strategy decide to switch strategies at some point? Suppose policymakers, in comparing these two approaches and the effects they have on growth, lack the perfect foresight necessary to choose the optimal market strategy, but instead start out using the state-directed strategy before deciding to switch? What would be the effects of such a switch in capital allocation strategies? In other words, should financial liberalization be implemented gradually, or with a big bang?

To answer this question, we first run a switching simulation, which we call “Switch 1,” in which the state-directed approach is used for periods 1–25, and then, in a sudden change, the market method is used for periods 26–50. Our results suggest that such sudden financial liberalization can be disastrous. As is shown in **Table 2** (including also the values for years

Table 2
A comparison of switching strategies

Period	Simple financial liberalization																				
	Switch 1							Switch 2							Switch 3						
	<i>T</i>	<i>C</i>	<i>K</i>	BCF	XR (%)	NER (%)	PR (%)	<i>T</i>	<i>C</i>	<i>K</i>	BCF	XR (%)	NER (%)	PR (%)	<i>T</i>	<i>C</i>	<i>K</i>	BCF	XR (%)	NER (%)	PR (%)
1	0.999	924	150	66	0	4	100	0.999	924	150	66	0	4	100	0.999	924	150	66	0	4	100
20	1.084	2039	2534	1014	0	2	45	1.084	2039	2534	1014	0	2	45	1.084	2039	2534	1014	0	2	45
25	1.120	2319	3057	1246	0	1	47	1.209	2438	3090	1417	0	2	44	1.256	2315	2522	1151	6	2	50
26	1.160	2409	3160	-257	30	1	34	1.227	2511	3201	639	26	2	43	1.281	2390	2578	962	12	1	57
27	1.258	2229	2355	-793	40	-3	8	1.288	2634	3056	-656	35	-0	8	1.313	2428	2515	985	11	1	44
28	1.338	1798	1434	-708	35	-11	3	1.348	2122	1960	621	11	-9	24	1.341	2430	2434	1220	5	-0	59
29	1.396	1437	802	562	0	-13	63	1.370	2072	1818	1103	0	-3	74	1.360	2500	2496	1379	3	1	65
30	1.401	1556	971	641	0	2	83	1.373	2193	1992	1158	2	3	65	1.371	2597	2629	1437	3	2	68
35	1.465	2213	1830	1168	3	3	68	1.451	2785	2733	1568	5	2	64	1.459	3186	3334	1875	5	2	65
50	1.733	4830	4853	3256	5	2	68	1.748	5311	5475	3600	5	1	68	1.748	5690	6049	3822	6	1	66
<i>Mean</i>	<i>1.282</i>	<i>2249</i>	<i>2168</i>	<i>1085</i>	<i>4</i>	<i>2</i>	<i>53</i>	<i>1.288</i>	<i>2511</i>	<i>2551</i>	<i>1322</i>	<i>3</i>	<i>2</i>	<i>52</i>	<i>1.293</i>	<i>2673</i>	<i>2762</i>	<i>1465</i>	<i>3</i>	<i>2</i>	<i>54</i>
<i>Growth 0–50</i>	<i>1.1%</i>	<i>3.5%</i>	<i>7.4%</i>					<i>1.1%</i>	<i>3.7%</i>	<i>7.6%</i>				<i>1.1%</i>	<i>3.9%</i>	<i>7.8%</i>					
<i>Growth 40–50</i>	<i>1.2%</i>	<i>5.1%</i>	<i>6.0%</i>					<i>1.3%</i>	<i>4.4%</i>	<i>4.7%</i>				<i>1.3%</i>	<i>4.1%</i>	<i>4.1%</i>					
<i>Recession</i>		<i>-40%</i>							<i>21%</i>						<i>1%</i>						
<i>Length</i>		<i>3</i>							<i>2</i>						<i>1</i>						

20, 26–30, and 35), a simple switch from state-directed to market strategies results in severe recession, with a three period decline of 40% in output and consumption. Exit rates increase dramatically to 40% of the population, or about 70% of the manufacturing firms operating in period 25. The cause of this recession is a feedback loop: when firms are shut down, output declines, savings declines, and remaining firms must compete for reduced lending, forcing higher interest rates that make many more firms unprofitable. The capital stock declines dramatically, the financial sector suffers 3 years of heavy losses, and net entry rates turn negative, but by period 30 the economy is growing again. By the end of the 50 periods, the economy has much higher technology, consumption, and net bank cash flows that it would have had if it had remained with the state-directed strategy, but the average consumption over the 50 periods is less. Thus even with a discount rate of zero, big bang financial liberalization is not preferable to remaining with the state-directed strategy unless we extend the analysis beyond 50 periods,¹⁰ and net bank cash flows are still lower at the end of period 50.

5.1. Alternative switching strategies

We next consider two alternative approaches, in which financial sector reforms are begun at an earlier date and phased-in. In “Switch 2,” after period 20 (instead of after period 25) the banking system implements an initial policy change by allocating capital according to the market-oriented strategy described above, but though it denies unprofitable firms any additional capital, it continues to subsidize them enough so they continue to operate. Then, after period 25, the subsidization ends and the unprofitable firms go bankrupt. In the second alternative to big bang financial liberalization, which we call “Switch 3,” the gradual strategy of Switch 2 is followed with one addition: during the phase-in period, the poorest performing 10% of firms are allowed to shut down.

As expected, Switch 2 reduces the severity of the recession, to a 2-year drop of 21%; though exit rates are almost as high, the shut down firms now do not have as much capital stock, and the decline is not quite so disastrous. Technology grows more rapidly than in Switch 1, and at a discount rate of 10% the present discounted value of consumption through period 50 is higher than if the economy remained with the state-directed strategy.

Switch 3, however, almost eliminates the recession, as consumption and output fall by only 1% for 1 year. Exit rates are 6% of the population by the time full liberalization is implemented, but they rise much less afterwards than the other switching strategies. By the end of period 50, consumption, capital stock, and bank cash flow is much higher; though growth rates in the last decade are not as high as in the other switching strategies, this may be because the economy is beginning at a higher base.

Thus, it appears (in this simulation) that phased-in liberalization may reduce the resulting recession, if during the phase-in period the banking system is able to credibly change its lending strategies to reflect market principles. Allocating credit by more rational means reduces the capital stock that may be destroyed by later implementation of bankruptcy, and initially limiting bankruptcy to only the poorest performers reduces the economic contagion of capital destruction.¹¹ There may be high subsidization costs, however, during the phase-in period as unproductive firms can no longer rely on bank loans for new capital stock to help

finance their cash flow, and there may also be moral hazard problems that make credible implementation difficult.

5.2. *The effects of delaying liberalization*

The improvement in the model's performance with the two alternative switching strategies, relative to the simulation of sudden big bang liberalization, suggests that better results occur when the transition is commenced earlier and phased-in to avoid a "cold turkey" impact on the economy. Yet policymakers lack perfect foresight, and instead of starting earlier they may choose to delay full financial liberalization in order to allow for a phase-in period.

We re-run the simulations again, delaying all three switching strategies by 5 years, to gauge the impact of delaying liberalization. The results demonstrate that delay may increase the transition costs. With Switch 1, the big bang approach to financial liberalization, the economy simply collapses. Within 5 years of the start of liberalization, all manufacturing firms exit the market, and the process of economic transformation must begin anew. With Switch 2, which begins with a five-period phase-in of market allocation prior to the removal of limits on bankruptcy, a three-period recession begins in period 32, with a decline in output and consumption of 43%, approximately double the decline without the delay and even larger than the 40% decline resulting from big bang liberalization. With Switch 3, which allows only the poorest performing 10% of manufacturing firms to exit during the phase-in period, the recession lasts only one period with an output decline of only 4%, but this is much larger than without the decline. Overall, the delay in liberalization allows the bad debt problem to grow, worsens the recession, and leads to less output over the time horizon of the simulation.

The performance of six key results—consumption, technology, profitability rates, exit rates as a percentage of the total population, net entry rates (gross entry less the previous period's exit rate), and net bank cash flows—are shown in Figs. 1–6, for the state-directed strategy, market strategy, and the three switching strategies. In Fig. 1, which also includes consumption for the delayed versions of Switch 2 and Switch 3, we can see that all methods of switching ultimately lead to higher incomes than the state-directed strategy, though Switch 1 and the delayed Switch 2 are the relatively worst outcomes. For a policy-maker in period 25 choosing between four alternatives—no financial liberalization, big bang liberalization, a phased-in delayed Switch 2 strategy, and a phased-in delayed Switch 3 strategy—the latter is clearly the best option.

In Fig. 2, switching appears to lead to sudden jumps in the average technological level that almost catch up (in the long-run) to the market strategy. Fig. 3 shows that liberalization can lead to significant declines in solvency, then significant improvements that converge to the market strategy. Fig. 4 shows that liberalization leads to very high exit rates which are eased by phasing in liberalization. Fig. 5 shows that the market strategy leads to higher net entry rates, in spite of having non-zero exit rates, and while exit dominates entry during liberalization-induced recessions, long-run net entry rates are higher after the recession. Finally, Fig. 6 shows that bank cash flows can turn decidedly negative as a result of liberalization.

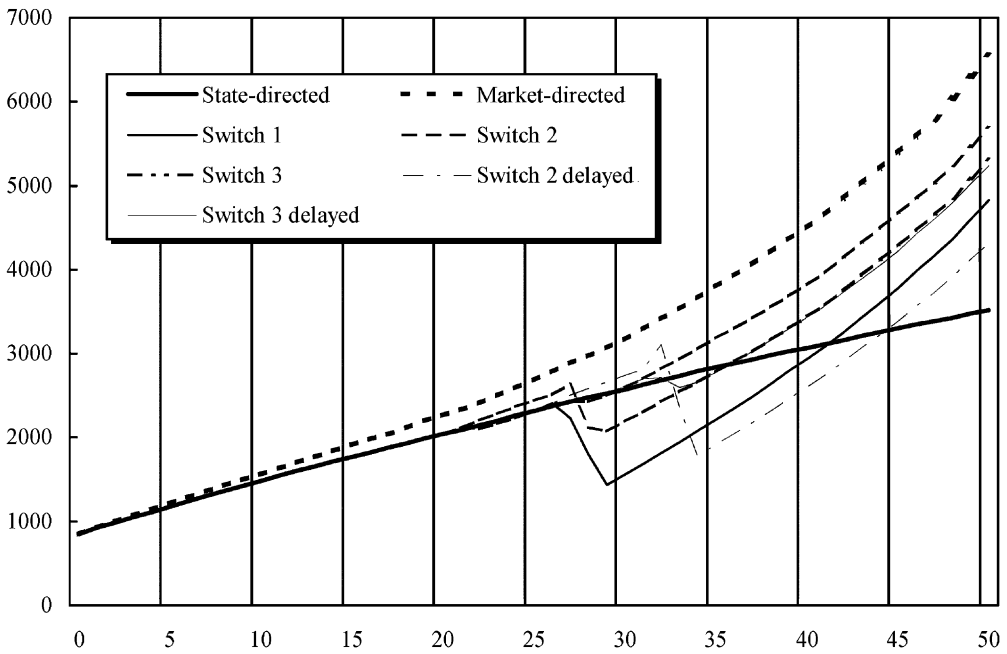


Fig. 1. Consumption under alternative strategies.

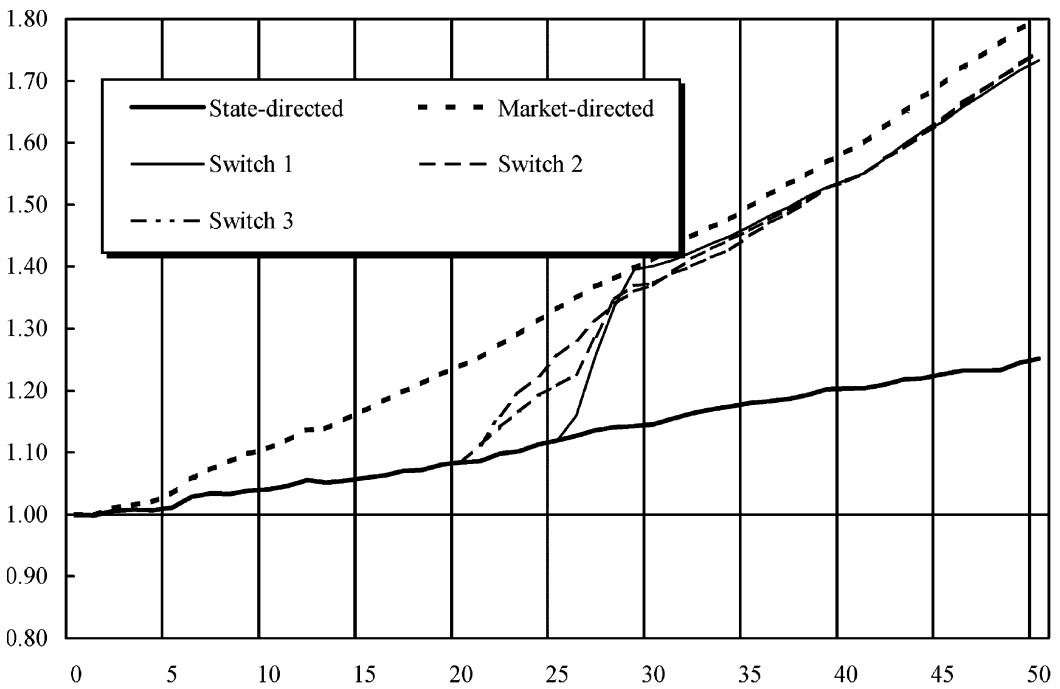


Fig. 2. Technology under alternative strategies.

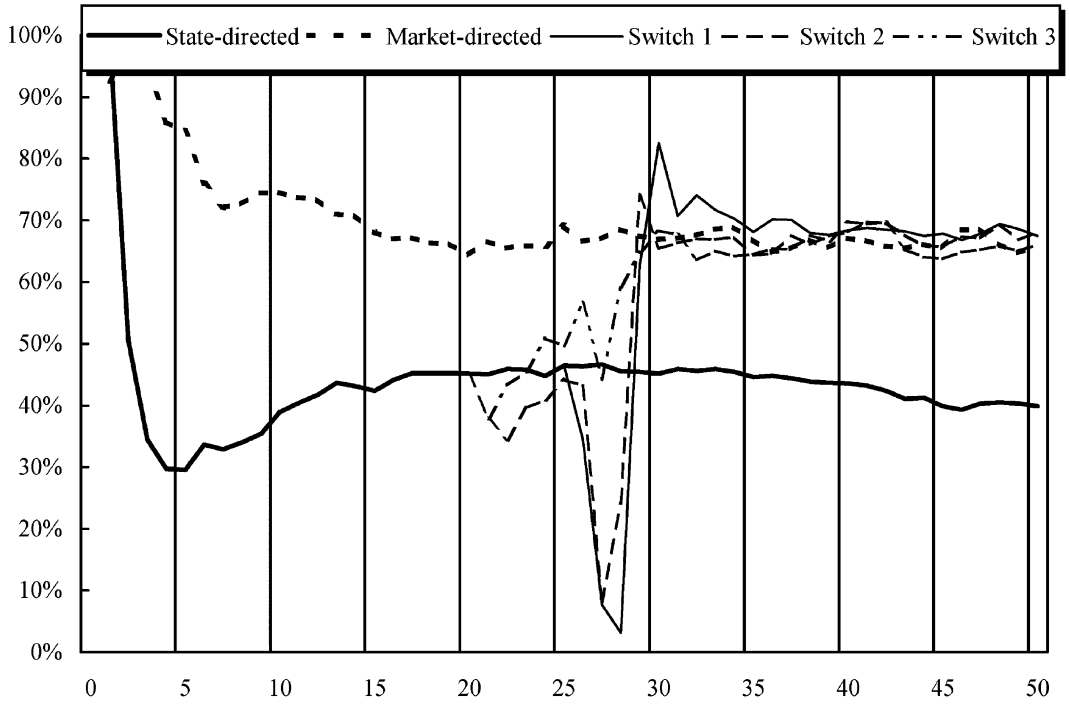


Fig. 3. Profitability rates under alternative strategies.

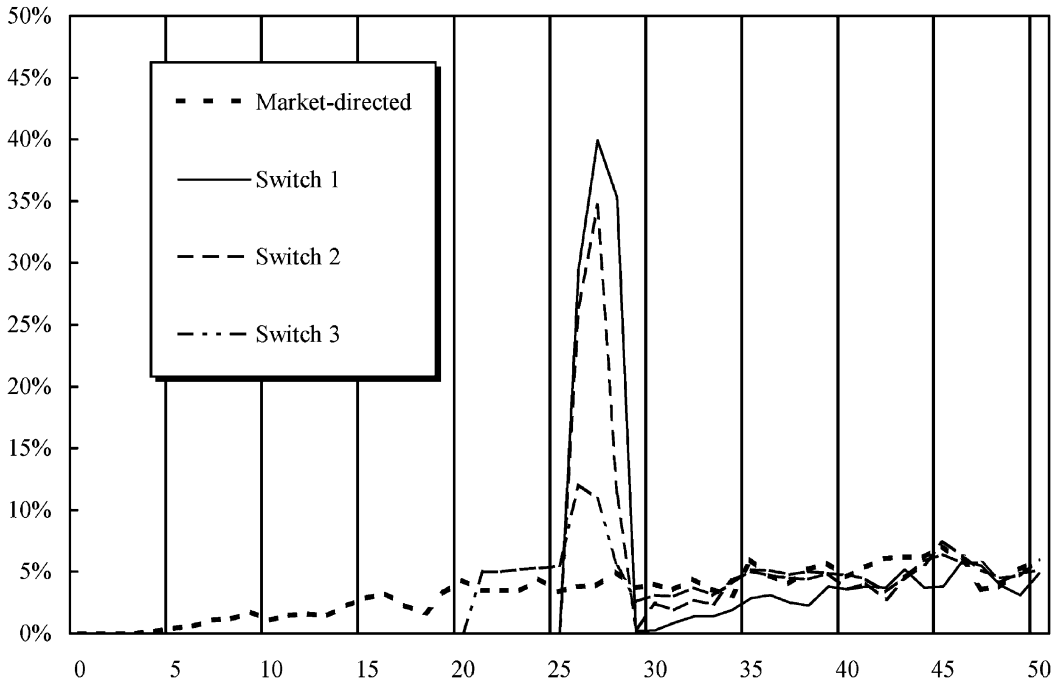


Fig. 4. Exit rates under alternative strategies.

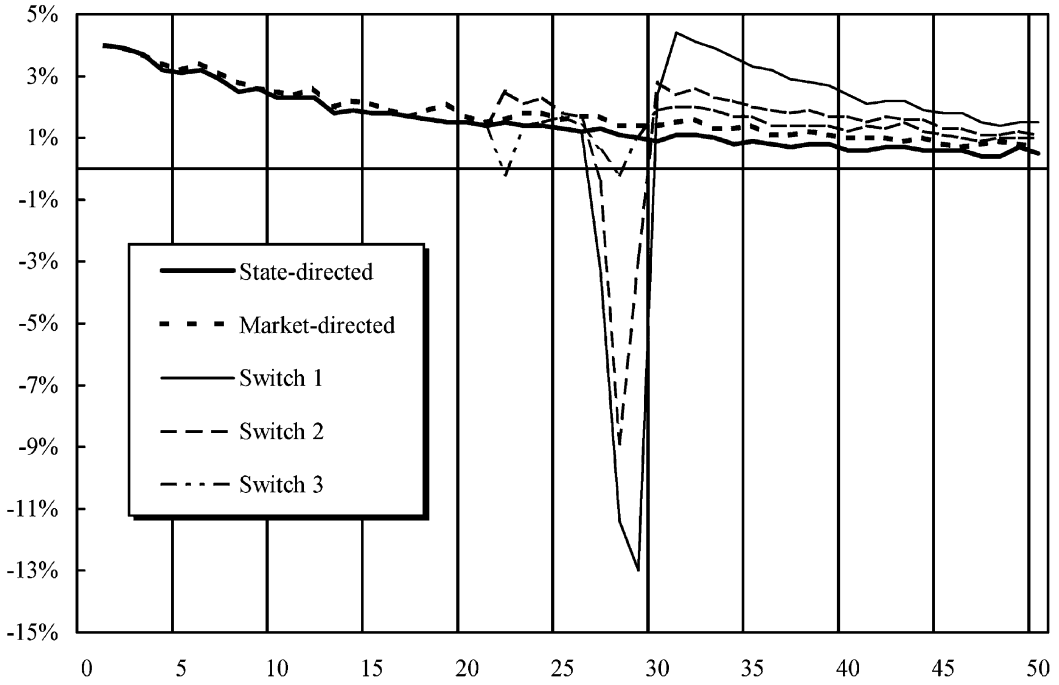


Fig. 5. Net entry rates under alternative strategies.

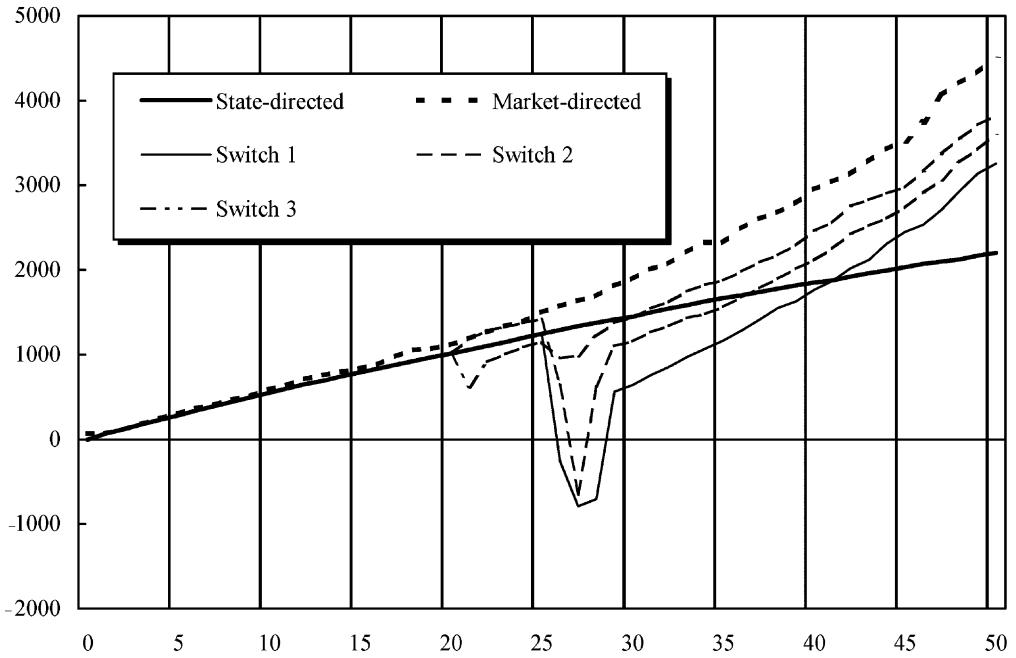


Fig. 6. Net bank cash flows under alternative strategies.

6. Implications and conclusions

While they do not constitute a formal proof, the simple model and simulations¹² described above suggest that market-directed financial regimes that permit bankruptcy are preferable to state-directed financial regimes that prevent bankruptcy, and this particular difference is fundamental to an understanding of Asian financial problems. A market-based strategy of capital accumulation does a better job of selecting for better technologies and inducing more rapid growth in the long-run, but financial liberalization starting from a state-directed base, while necessary for long-run growth, can be very disruptive.

Several policy implications emerge from the analysis. Regulatory authorities in Asian countries would benefit from less reliance on the type of financial system developed by Japan and emulated by many other Asian countries. These financial systems are designed to limit bankruptcy in the real sector, but bankruptcy serves an economically important function. While the bank-finance model is not inherently inefficient in the abstract, in the absence of alternative methods of allocating capital it provides the basis for a policy of preventing bankruptcy because the close relationship between banks and firms encourages informality, non-transparency, and mutual support. Asian regulatory authorities should adopt policies that reduce the importance of the type of bank-firm relationship that evolved in South Korea and Japan, for example. The establishment of money and capital markets is important since they encourage transparency, enhance the channels of finance, weaken the bank-firm relationship, and contribute to internationalization of finance, among other advantages. Money and capital market formation are not merely another policy of liberalization, but represent a regime shift that supports market forces throughout the entire financial system. The limited development of money and capital markets in many Asian countries supports the continuation of the bank-finance model and all of its associated characteristics, the most important being the minimization of bankruptcy.

Financial liberalization requires an extensive bankruptcy infrastructure to provide for the orderly closing down of insolvent firms and the disbursement of assets and disposition of liabilities. Policies need to be implemented to render firms more responsive to their shareholders to impose discipline on troubled firms and reduce the potential for the bank-firm relationship to conceal problems. But specific consideration needs to be given to the transaction costs of shifting from a state-directed to a more market-oriented financial system. Advocates of market-oriented financial systems have frequently underestimated the difficulty of shifting from one regime to another and as a result, have not paid sufficient attention to minimize the transaction costs of switching. The results of increased financial liberalization in the United States, and other countries with market-oriented financial structures, should not be lightly compared those that can be anticipated in a state-directed financial regime. Even prior to liberalization, the United States permitted bankruptcy, and thus enhancing competition did not result in a fundamental change in the core principles of the financial regime.

In contrast, financial liberalization in Japan or South Korea, both of which have traditionally prevented bankruptcy, resulted in transition costs that were significantly underestimated when based on the U.S. liberalization process. Under our admittedly-simple assumptions, financial liberalization has the potential to impose severe costs on the economy; though there may be some potential for reducing the costs by phasing it in, delay without beginning the process only increases the size of the problem. The model and simulation results, while simple, carry a strong

message: policymakers who are currently considering financial liberalization should not underestimate the difficulties, and should carefully weigh their strategies.

Notes

1. See, for example, [Kwack's \(2000\)](#) study concluding that high corporate leverage ratios were a significant determinant of the outcome of the Asian financial crisis because they were the primary determinant of non-performing bank loan ratios. [Woo, Sachs and Schwab \(2000\)](#) provide an overview of the Asian financial crisis.
2. Others part of the financial system were also designed for this purpose; for example in Japan, the Fiscal Investment and Loan Program was designed to limit risk and bankruptcy for small and medium sized firms that were unable to obtain credit in the private market ([Cargill & Yoshino, 2000](#)).
3. This paper does not consider bankruptcy in the financial sector. Bankruptcy in the financial sector is a separate issue because fiat-based monetary systems are subject to contagion. Even in a liberated financial involvement, government plays an important role in limiting the disruptive effects that bankruptcy of financial institutions, especially banks, can have on the economy.
4. A key characteristic of Asian financial systems was to limit household access to consumer and mortgage credit and thereby restrain household spending.
5. [Hoshi and Kashyap \(1999\)](#), for example, project a large reduction in Japan's banking sector in the next decade if money and capital markets develop to the level they exist in the United States.
6. Many Asian economies have adopted some version of the Japanese state-directed financial regime, but of course not all. Certainly Hong Kong and Singapore relied on an Anglo-American financial system, and other economies (e.g., Malaysia and the Philippines) were influenced by it.
7. The Japanese financial regime that emerged after World War II was the outcome of a process started in 1868. The 1868 Meiji Restoration was a political decision to transform Japan into a modern industrial and military power, to first achieve parity, and then to surpass the west. Japan lacked financial institutions and markets at the start of the Restoration. A national banking system was established in 1876, a postal savings system in 1875, and a central bank in 1882. The financial system was consolidated and subject to greater government control in the wake of the collapse of the banking sector during the late 1920s. Consolidation and government control continued with war mobilization and war in the 1930s and first half of the 1940s, respectively. Over much of this development, Japan's financial system was viewed as an instrument of industrial policy, was designed to ensure a steady flow of credit to support the business sector, and limit bankruptcy among the large firms. The Japanese financial regime reached full maturity in the early part of the 1950s. [Cargill et al. \(1997, 2000\)](#) provide detailed discussion of the development of Japanese post-war finance. [Hoshi and Kashyap \(2001\)](#) provide an excellent discussion of the development of Japanese finance focusing on corporate financing and governance.

8. Berkovitch and Israel (1999) argue that optimal bankruptcy procedures would differ between developed economies with market-based financial systems, developed economies with bank-based systems such as Germany and Japan, and developing economies.
9. The assumption of a small transactions cost to entry or exit stabilizes firm turnover rates; without it, small perturbations lead to the majority of firms exiting and then immediately re-entering the manufacturing sector.
10. Extending the analysis (assuming the growth rates in period 40–50 continue) with a discount rate of 10%, the present discounted value of consumption under financial liberalization finally exceed that of not liberalizing by period 70.
11. Parker (1995) compared the contagion problems of sudden liberalization to suddenly allowing fires in national forests after years of fighting them vigorously. Our results suggest that a controlled burn may be less likely to lead a catastrophic fire, in which the abundance of dead wood leads to the destruction of even healthy trees.
12. Analytical solutions are difficult to derive in this situation, and comparative simulations are not mathematical proofs. To determine whether our results are reasonably robust, we ran the simulations for different values of the initial parameters. We perturbed each of the eight parameters— α , β , ζ , Ω , δ , ζ , μ , and σ —up and down by 10% of its initial value. The magnitude of the results are highly sensitive to the initial parameter values; however, the general pattern of our results is unchanged. In all cases, the 50-year growth rate for the market approach exceeds that of the state-directed approach, and in almost all cases (except for a higher β) the 50-year growth rate from big bang financial liberalization still exceeds the state-directed approach, though the implicit break-even discount rate may vary. In almost all cases (except for a lower β), the recession caused by financial liberalization is most severe. Thus we can say with some confidence that while the numbers we cite may be considered mere examples, the implications of the numbers have a more general applicability.

Acknowledgments

The authors are grateful to the following individuals for their comments and advice: to Wing Thye Woo, Alan Taylor, Lee Branstetter, and other faculty of the Department of Economics at the University of California, Davis; to Michael Hutchison, Takeo Hoshi, and the other organizers and participants of the West Coast Japan Economic Seminar at the University of California, Santa Cruz; and to Reuven Glick, Ramon Moreno, Mark Spiegel, and other economists at the Federal Reserve Bank in San Francisco. All remaining errors are the responsibility of the authors.

References

- Baird, D. G. (1998). Bankruptcy's uncontested axioms. *Yale Law Journal*, 108(3), 573–599.
- Bekaert, G., Harvey, C. R., & Lundblad, C. (2001). *Does financial liberalization spur growth?* Cambridge, MA: MIT Press, NBER Working Paper 8245.

- Berkovitch, E., & Israel, R. (1999). Optimal bankruptcy laws across different economic systems. *Review of Financial Studies*, 12(2), 347–377.
- Caballero, R. J., & Hammour, M. L. (1999). *The cost of recessions revisited: a reverse-liquidationist view*. Cambridge, MA: MIT Press, NBER Working Paper 7355.
- Caballero, R. J., & Hammour, M. L. (2000). *Creative destruction and development: institutions, crises, and restructuring*. Cambridge, MA: MIT Press, NBER Working Paper 7849.
- Cargill, T. F. (1998). Korea and Japan: the end of the Japanese financial regime. In G. Kaufman (Ed.), *Bank crisis, causes, analysis and prevention*. Stamford, CT: JAI Press.
- Cargill, T. F., Hutchison, M. M., & Ito, T. (1997). *Political economy of Japanese monetary policy*. Cambridge, MA: MIT Press.
- Cargill, T. F., Hutchison, M. M., & Ito, T. (2000). *Financial policy and central banking in Japan*. Cambridge, MA: MIT Press.
- Cargill, T. F., & Parker, E. (2001). Financial liberalization in China: limitations and lessons of the Japanese regime. *Journal of the Asia Pacific Economy*, 6(1), 1–21.
- Cargill, T. F., & Royama, S. (1988). *The transition of finance in Japan and the United States*. Stanford, CA: Hoover Institution Press.
- Cargill, T. F., & Yoshino, N. (2000). The postal savings system, fiscal investment and loan program, and modernization of Japan's financial system. In T. Hoshi & H. Patrick (Eds.), *Crisis and change in the Japanese financial system*. Norwell, MA: Kluwer Academic Publishers.
- Cornelli, F., & Felli, L. (1997). Ex-ante efficiency of bankruptcy procedures. *European Economic Review*, 41(3–5), 475–485.
- Hart, O., La Porta Drago, R., Lopez-de-Silanes, F., & Moore, J. (1997). A new bankruptcy procedure that uses multiple auctions. *European Economic Review*, 41(3–5), 461–473.
- Hoshi, T., & Kashyap, A. (1999). *The Japanese bank crisis: where did it come from and how will it end?* In B. S. Bernanke & J. Rotemberg (Eds.). Cambridge, MA: The MIT Press, NBER Macroeconomics Annual 1999.
- Hoshi, T., & Kashyap, A. (2001). *Corporate financing and governance in Japan*. Cambridge, MA: The MIT Press.
- Hussain, Q., & Wihlborg, C. (1999). Corporate insolvency procedures and bank behavior: a study of selected Asian economies. Washington, DC: International Monetary Fund. Working paper WP/99/135.
- Kane, E. J. (2000). The dialectical role of information and disinformation in regulation-induced banking crises. *Pacific Basin Finance Journal*, 8(3/4), 285–308.
- Kawai, M. (2000). The resolution of the East Asian crisis: financial and corporate sector restructuring. *Journal of Asian Economics*, 11, 133–168.
- Krugman, P. (1994). The myth of Asia's miracle. *Foreign Affairs*, 73(6), 62–78.
- Kwack, S. Y. (2000). An empirical analysis of the factors determining the financial crisis in Asia. *Journal of Asian Economics*, 11(2), 195–206.
- Li, D. D., & Li, S. (1999). An agency theory of the bankruptcy law. *International Review of Economics and Finance*, 8(1), 1–24.
- Lincoln, E. (2000). *Japan's troubled efforts at systemic economic reform*. CJES Research Papers. Centre for Japanese Economic Studies, Macquarie University, Sydney, Australia.
- Ostrom, D. (2000, April 7). *The Keiretsu system: cracking or crumbling?* Japan Economic Institute Report No. 14A.
- Parker, E. (1995). Schumpeterian creative destruction and the growth of Chinese enterprises. *China Economic Review*, 6(2), 201–223.
- Reeb, D. M., & Kwok, C. C. Y. (2000). Mainbanks and investment efficiency in financial distress. *Journal of Financial Research*, 33(4), 395–410.
- Reynolds, S. E., Ratanakomut, S., & Gander, J. (2000). Bank financial structure in pre-crisis East and Southeast Asia. *Journal of Asian Economics*, 11, 319–331.
- Spiegel, M., & Yamori, N. (2001, January 20). *Financial turbulence and the Japanese main-bank relationship*. Paper presented at the West Coast Japan Economic Seminar, University of California, San Diego.
- Woo, W. T., Sachs, J. D., & Schwab, K. (Eds.) (2000). *The Asian financial crisis*. Cambridge, MA: The MIT Press.