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**The Engine of Capitalist Process:
Entrepreneurs in Economic Theory**

Robert L. Formaini

**Banking and Currency Crisis Recovery:
Brazil's Turnaround of 1999**

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The Engine of Capitalist Process: Entrepreneurs in Economic Theory

Robert L. Formaini

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Market economies rely on entrepreneurs as their driving force. In this article, Robert Formaini examines why entrepreneurs are important for us today. He traces the history of the concept of entrepreneurship in economic theory, showing how the concept's popularity has varied greatly since its first use. Formaini seeks to examine the concept's development as one of the key explanatory variables for profit, economic growth, and income differentials. Finally, he investigates the policy implications of adopting different views of entrepreneurs.

Banking and Currency Crisis Recovery: Brazil's Turnaround of 1999

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Of the many countries that suffered exchange rate crises in the 1990s, Brazil and Korea recovered most rapidly. This article analyzes the Brazilian recovery. William Gruben and John Welch focus on the freedom that Brazilian bank health gave to the central bank to pursue a postcrisis monetary policy that would settle markets, reestablish price stability, and encourage investment and the return of foreign capital. Brazilian bank health was not an accident; it reflected not only bank responses to precrisis changes in government regulations, but also to large precrisis interest rate increases associated in part with Brazil's efforts to defend its currency.

Recovery from a Financial Crisis: The Case of South Korea

Jahyeong Koo and Sherry L. Kiser

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Among the countries that were impacted by the 1997 Asian crisis, South Korea (Korea hereafter) has demonstrated the fastest recovery by blocking its downward spiral. Jahyeong Koo and Sherry Kiser examine the recovery process of financial crises, particularly in Korea, in light of the weak-fundamentals and financial-panic views. Since neither of these views adequately explains Korea's recovery, the authors look at other phenomena for an explanation. Alternative financial arrangements and labor market adjustments are specifically examined. The authors acknowledge that Korea's recovery was only possible after it gained control of its exchange-rate crisis. Since the recovery process affirms neither the weak-fundamentals view nor the financial-panic view, Koo and Kiser conclude that containing the downward spiral was a combination of factors working together and that much of Korea's recovery can be attributed to the creation of alternative funding sources and labor adjustments.

The Engine of Capitalist Process: Entrepreneurs in Economic Theory

Robert L. Formaini

Entrepreneurship is not planning by groups or management decisions by corporate bodies, but the exploitation of perceived opportunity by individuals based solely on personal judgments and visions that others either don't see or can't bear the risks of acting on.

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Let us call a halt to this imaginary dialogue [between Karl Marx and Joseph Schumpeter] and return to the main subject at hand: the neglect of entrepreneurship in modern, mainstream economics. Surely, this neglect must give us pause? It is a scandal that nowadays students of economics can spend years in the study of the subject before hearing the term “entrepreneur,” that courses in economic development provide exhaustive lists of all the factors impeding or accelerating economic growth without mentioning the conditions under which entrepreneurship languishes or flourishes, and the learned comparisons between “socialism” and “capitalism” are virtually silent about the role of entrepreneurship under regimes of collective rather than private ownership.

—Marc Blaug (1986, 229)

Some of the simplest questions often asked about economic performance have the most complex answers. Three examples: How can profit exist? What causes economic growth? How does a market economy coordinate resource use? Over the long history of the development of economic doctrine, many great minds have wrestled with these questions and many have turned to the concept of the entrepreneur. This term has long been used by economists, albeit with varying emphases at different times, and recently enjoyed a renaissance in economic and business school pedagogy because of the Internet's evolution and the small-business explosion it generated. The concept remains relevant as America's economy enters the new millennium, for how we treat our entrepreneurs has immediate and profound effects on our overall national economic performance and the direction of economic activity.

According to modern economic theory, an entrepreneur is an individual who takes on certain tasks based solely on a perception of market opportunities and how to exploit them. This person is, to varying degrees, a risk taker, resource manager, innovator, arbitrager, and both creator and destroyer. Entrepreneurship is not planning by groups or management decisions by corporate bodies, but the exploitation of perceived opportunity by individuals based solely on personal judgments and visions that others either don't see or can't bear the risks of acting on. It was entrepreneurs who created the New Economy. The story of who they were and how they did it is more enlightening than anything pure theory can offer on this topic.¹

But theory remains integral to understanding, and so theorists are appealing more often to the idea of entrepreneurship and the role of entrepreneurs as explanatory variables for economic reality. It is useful to look at the historical development of this concept. Only by studying the past can we expect to understand the present.

THE HISTORY OF A CONCEPT

Beginnings—The Physiocrats

Most historians of economic thought date the genesis of modern economic theory to the early eighteenth century in France, where a group of thinkers called the Physiocrats emerged. The most famous among them was Richard Cantillon (1680–1734), whose 1755 work *Essai sur la nature du commerce en general* (written between 1730 and 1734) first introduced the concept of the entrepreneur into economic analysis (Spengler 1960). The concept itself had been used before Cantillon's time, however, to mean various things. One writer has summarized its history as follows:

The most general and probably the earliest meaning of the word entrepreneur is *celui qui entreprend*, which means an active person with initiative. The word originates in the verb *entreprendre*, which has a meaning similar to “getting things done.” Up unto the sixteenth century *entrepreneur* meant: (1) grasp, take hold of (saisir) (2) surprise, discover (surprendre).²

The term seems to have evolved in the fifteenth century and was applied to people who ran risks, especially during wars. By the sixteenth century, the term was being applied to “a large scale businessman who contracted to supply, having taken upon himself the responsibility to combine the factors of production at his own expense and risk.”³ As Rothbard (1995a, 351) writes about Cantillon's analysis:

Thus Cantillon divides producers in the market economy into two classes: “hired people” who receive fixed wages, or fixed land rents, and entrepreneurs with non-fixed, uncertain returns. The farmer–entrepreneur bears the risk of fixed costs of production and of uncertain selling prices, while the merchant or manufacturer pays similar fixed costs and relies on an uncertain return. Except for

those who only sell “their own labour,” business entrepreneurs must lay out monies which, after they have done so, are “fixed” or given from their point of view. Since sales and selling prices are uncertain and not fixed, their business income becomes an uncertain residual.

Rothbard also notes that, for Cantillon, entrepreneurs are equilibrating agents in the market system. This is in contrast to the analyses of some economists, especially Joseph Schumpeter, who later came to view entrepreneurs as disequilibrating factors.

Immediately after the publication and wide dissemination of Cantillon's work—one of the few works Adam Smith (1723–90) cites in his magisterial *An Inquiry Into the Nature and Causes of the Wealth of Nations*—a self-conscious school of thought arose named “physiocracy,” or rule by nature. Although Cantillon's *Essai* came first, the leader of this initial well-organized economic paradigm was not Cantillon but François Quesnay (1694–1774). The Physiocrats flourished for two decades before Smith published his classic work in political economy in 1776. Like many early political economists, Quesnay, a medical physician to the French court by vocation, studied and wrote about economics as an avocation.⁴

Quesnay's views about entrepreneurs resembled Cantillon's. Because of the physiocratic focus on the agricultural sector, Quesnay and his followers were referring to the land-owning entrepreneurs who guided food production when they argued that “the entrepreneur bears uncertainty, organizes and supervises production, introduces new methods and new products, and searches for new markets. In order to do this properly, he must gain free access to a wide variety of markets, and he must be able to rely on the government to provide for him the utmost freedom of action in his undertakings” (Hoselitz 1962, 247). The Physiocrats lived in an age dominated by agriculturally based economies, the Industrial Revolution's effects having only begun to transform the world economic landscape.

The later French political economists improved upon Cantillon's analysis of entrepreneurial behavior by adding what he had omitted, specifically the relationship between entrepreneurs and the sources of capital available for economic innovation. For Cantillon, the entrepreneur is simply a risk taker under conditions of uncertainty, but for the Physiocrats, and especially for the partial Physiocrat Anne-Robert-

Jacques Turgot (1727–81), the risks he takes are often borne out of his own stock of capital.⁵ This view made sense in a period when financial markets were crude and institutionally provided capital was rare.

The French political economist Jean-Baptiste Say (1767–1832) has been falsely credited as the first to discuss the entrepreneur's role in economic theory.⁶ To be fair to Say, there is no direct, irrefutable evidence that he appropriated the ideas of those political economists who preceded him in France, although some historical speculation exists (Hoselitz 1962, 248–50). What is not historically disputed is that the French tradition had a more fully developed and more sophisticated theory of entrepreneurial activity than did the British classical counterpart. And that meant, by logical extension and ex post empirical confirmations, that the French also better understood how a capitalist economic system actually functions. Unfortunately, because of the international dominance of British writers and thinkers during the nineteenth century, much of this knowledge lay dormant, awaiting rediscovery and elaboration.

The Classical School (1776–1870)

“Entrepreneurs” virtually disappeared from nineteenth century British political economy. Adam Smith set the precedent with his hugely influential *An Inquiry into the Nature and Causes of the Wealth of Nations*, considered the fountainhead of the entire British classical school of political economy.⁷ Did this mean Smith was unaware of the role entrepreneurs played or that he merely lacked a term for them? Some have claimed that Smith's view of the “undertaker” was nothing more than the physiocratic entrepreneurial model in English terminology (Elkjaer 1991, 806–7). Others deny that Smith understood or used the entrepreneur concept at all (Rothbard 1995b, 25). Smith's defenders claim that, for British classical political economy, production was a given, and, therefore, the roles of individual productive factors needed no elaboration. But this won't do, because Smith and his successors did discuss the factors of production and their rates of remuneration in great detail, all the while excluding any separate role for the entrepreneur, whose title was replaced by the all-encompassing term “capitalist” and whose function became automatic. Schumpeter (1950, 556) is well worth quoting here:

Ricardo, the Ricardians, and also Senior took indeed no notice of Say's suggestion and in fact almost accom-

plished what I have described as an impossible feat, namely, the exclusion of the figure of the entrepreneur completely. For them—as well as for Marx—the business process runs substantially by itself, the one thing needed to make it run being an adequate supply of capital.

David Ricardo (1772–1823) and his followers ought to have built on the early French insights but didn't, even though Say's extensions were available to them in a translated edition for more than a decade before Ricardo wrote his *Principles of Political Economy* (Hebert and Link 1988).⁸ Karl Marx (1818–83) ignored entrepreneurs altogether because they didn't fit in well with his division of all economic reality into the bourgeoisie and the proletariat, the “capitalists” and the “workers.” This seems an especially large oversight for the man who, according to Blaug (1997), introduced the concept “technological change” into economic theory, because entrepreneurs are almost always linked with technical change, and Marx had the benefit of seeing many such entrepreneurial fortunes built on innovative ideas (see Schumpeter 1968, 516).

The only classical school economist who wrote anything detailed about entrepreneurs was Jeremy Bentham (1748–1832). Bentham disagreed with Smith about usury (*Defence of Usury*, 1787), believing that charging interest on loans was a key part of the innovative process that entrepreneurs continually create. Except for this one dissent, the British classical school remained mostly mute on the topic of entrepreneurship between the time of Smith's early and narrow writings and John Stuart Mill's later, somewhat ambiguous ones.⁹

Mill (1806–73), arguably the greatest of the classical economists and the school's last major figure, devoted—in a two-volume, 1,000-plus-page work—but two sentences to the entrepreneur, illustrating the British classical school's final stance on the issue of what entrepreneurs do and what rewards they might receive:

These different compensations may be paid to either the same, or to different persons. The capital, or some part of it, may be borrowed: may belong to someone who does not undertake the risks or the trouble of the business. In that case, the lender or owner is the person who practices the abstinence; and is remunerated for it by the interest paid to

him, while the difference between the interest and the gross profits remunerates the exertions and risks of the undertaker.¹⁰

Because classical economists made little of the distinction between entrepreneurs—who assume risks, combine productive factors, and explore the possibilities of innovation—and capitalists—who merely provide the means for investment in machines and processes—the early physiocratic insights and extensions of Say were mostly ignored during the classical period in England.

Other Nineteenth Century Economic Thinkers

Austria, Sweden, and Germany produced many influential, brilliant, and widely read economic theoreticians during the nineteenth century. Building on the early insights of the Physiocrats, these thinkers made significant advances in the theory of the entrepreneur. Some of the German contributions were made by J. H. von Thunen (1783–1850), H. K. von Mangoldt (1824–68), Gottlieb Hufeland (1760–1817), and Adolf Riedel (1809–72). Riedel embellished Cantillon's view of the entrepreneur, adding the insight that entrepreneurs reduce uncertainty for others by taking it on themselves in the form of fixed-price contracts over time. If they guess right, they enjoy a surplus or profit; if not, they suffer a loss. Thunen extended the distinction between entrepreneurial activity and mere managerial activity and also brought together the two views of the entrepreneur in the process. Were they risk takers/bearers or innovators, or both? Thunen argued that they were both.

Mangoldt brought the element of time into the equation of risk bearing. In his view, the longer the productive process, the more uncertain and, hence, riskier would be the entrepreneur's function. Although this seems obvious, the inclusion of time in economic theory came slowly. Mangoldt anticipated Frank Knight's later distinction between risk and uncertainty. Thunen, in his *The Isolated State* (1850), put forward exactly this idea in explaining the rewards that accrue to entrepreneurs. To quote Blaug (1986, 222):

The rewards of the entrepreneur, Thunen went on to say, are therefore the returns for incurring those risks which no insurance company will cover because they are unpredictable. Since novel action is precisely the condition under

which it is impossible to predict the probability of gain or loss, the entrepreneur is “explorer and inventor” in his field *par excellence* (Hebert and Link, 1988, 45–47).

The classical school came to an end with the so-called marginal revolution of the early 1870s, and its central doctrines became known thereafter as neoclassicism (see, for example, Blaug 1986). During this period, roughly 1880–1910, British and Austrian theoretical output dominated the economics profession by way of such teachers or writers as Alfred Marshall (1842–1924), A. C. Pigou (1877–1959), Carl Menger (1840–1921), and Friedrich von Wieser (1851–1926). Also important, if not immediately appreciated, were France's Leon Walras (1834–1910) and Sweden's Knut Wicksell (1851–1926). These thinkers addressed numerous issues but didn't, for the most part, include any extensions of the theory of entrepreneurship, although they drew upon previous work and did discuss the issues surrounding entrepreneurship extensively (see Wieser 1967, 353–58).

BREAKING NEW GROUND

The economist most closely associated with the term entrepreneur is, paradoxically, the theorist who prophesied the entrepreneur's obsolescence. Joseph Schumpeter (1883–1950), with his evocative phrase “creative destruction,” gave the most sophisticated explanation of the concept.¹¹ Schumpeter was specific in arguing that the entrepreneur doesn't invent things, but exploits in novel ways what has already been invented. In combining existing inventions, the entrepreneur triggers creative destruction and brings into being new industries even as old ones are sometimes destroyed. Nor is Schumpeter's entrepreneur a risk bearer, for that role is played, in his view, by the financial intermediary who lends the funds for the new combination. Entrepreneurs then, are managers, deciding how resources will be used in a capitalist economy. They also are destabilizing agents because they change the existing relations and techniques of production. They lead the economy toward a better use of capital and knowledge, which is vital for macroeconomic growth and rising productivity.

Finally, Schumpeter's entrepreneurs are the causes of business cycles because their actions create dislocations that can come in waves. Cyclic downturns are characterized by

what Ludwig von Mises (1881–1973) called a “cluster of errors,” as most entrepreneurs suddenly guess wrong. Why? Schumpeter suggests three reasons: (1) innovative ways of applying existing inventions and resources immediately trigger emulation by others; (2) the extra demand that financial backing gives to these undertakings is financed by credit-expanding activities that banks can engage in under a fractional reserve system; (3) the new undertakings generate “spillover effects” and trigger similar dislocations in other industries (Schohl 1999).

Schumpeter emerged from the Austrian tradition, and his business cycle theory as well as his ideas about entrepreneurs were influenced by previous work in that tradition. For example, it was Austrian school founder Menger who first elaborated that paradigm’s view of entrepreneurs. According to Menger, entrepreneurs acquire information, make economic calculations, supervise production, and bear risks due to the uncertainty inherent in all human undertakings. But surprisingly, he held that the risk bearing aspect of entrepreneurship is trivial because of the possibility of profits. Like Menger, Schumpeter denied that entrepreneurship was primarily about risk taking (Hebert and Link 1988).

Another Austrian, Wieser, added a characteristic to entrepreneurs: alertness to the opportunities that surround them. Austrian school theorist Israel Kirzner later extended this view of entrepreneurs, whereas Schumpeter pursued Menger’s approach. This early work and its later extension make the Austrians the second organized economic school—after the Physiocrats—to work out extensive ideas about entrepreneurs and their effects on the economy and society.

France’s Walras seems the least likely to include entrepreneurship prominently in his models. After all, Walras was the creator of the modern general equilibrium system—a pillar of neoclassical economics—which states that equilibrium is reached by the efforts of an apocryphal “auctioneer.” Yet Walras allowed a crucial role for the entrepreneur as one of the major factors of production, and he was careful to distinguish the entrepreneur’s function from the capitalist’s. Further, in a disagreement with his French predecessors, Walras denied that arranging production was entrepreneurial; it was merely, in his view, managerial and was remunerated with wages, not profits. Walras had well-developed views about the role of entrepreneurs in the real world, even though they disappeared in the general equilibrium construct that emerged from his theoretical approach.

The British tradition during this time con-

tinued to place little emphasis on the entrepreneur, dominated as it was by Marshall and Pigou. This tendency continued with their pupil, John Maynard Keynes (1883–1946), in whose writings entrepreneurs play no major role whatsoever. In fact, Keynes (1964, 162) reduces entrepreneurial activities to the alleged “animal spirits” that drive certain people to seek profit, a contention that adds nothing to the economic insights of his predecessors.¹²

Intellectual intercourse in the late nineteenth and early twentieth centuries flowed in one direction: from Europe, and especially Germany, to America. This was unfortunate because many American economists had made advances in the theory of entrepreneurship from which their European counterparts might have profited. Among them were Amasa Walker (1799–1875), Francis Walker (1840–97), John Bates Clark (1847–1938), Frank Taussig (1859–1940), Herbert Davenport (1861–1931), and Frank Knight (1885–1972). Not since the Physiocrats had so much work been done on the topic of entrepreneurship, especially as it relates to entrepreneurs bearing risk and uncertainty. These writers also extensively explored whether entrepreneurs and capitalists are identical or whether they perform separate functions in the economy.

Davenport in particular made some interesting contentions, extending Cantillon’s belief that entrepreneurs bear risk because they don’t know what output can be sold for, nor even what their future input costs might be. Further, Davenport contended that entrepreneurs are the engine of capitalist production and, for that reason, economics ought to be the study of what they do (Hebert and Link 1988).

Davenport, like Clark and others before them, denied that profit is a return to risk bearing, arguing instead that profits are just a form of entrepreneurial wages paid for the specific managerial/visionary attributes of entrepreneurs. Davenport’s entrepreneurs are not like Schumpeter’s innovators who are busy transforming the economic landscape through creative destruction. They are equilibrators, the restorers of equilibrium, rather than disequilibrators; hence, Davenport anticipates Kirzner’s (1973) arguments.

Knight, in his famous 1921 work *Risk, Uncertainty and Profit*, succeeded in carefully delineating the modern contours of the theory of the entrepreneur. Knight’s distinction between risk and uncertainty has since been expanded, but his work was pioneering, nonetheless, and extended Cantillon’s basic insight

about the economic risk bearing (now called uncertainty) that is one of the entrepreneur's primary functions in the economy (Knight 1971, 270–90). Knight's view of this aspect of entrepreneurial function and its reward—profit, as he defined it—is summed up succinctly in the following passage:

Profit arises out of the inherent, absolute unpredictability of things, out of the sheer brute fact that the results of human activity cannot be anticipated and then only insofar as even a probability calculation in regard to them is impossible and meaningless. The receipt of profit in a particular case may be argued to be the result of superior judgment. But it is judgment of judgment, especially one's own judgment, and in an individual case there is no way of telling good judgment from luck, and a succession of cases sufficient to evaluate the judgment or determine its probable value transforms the profit into a wage.¹⁵

Entrepreneurs receive their profits from what we call uncertainty. It can't be insured against as risk can because it is inherently unknowable. And the public policy implication of this type of uncertainty is important, as F. A. Hayek (1969, 203) was to point out: "To assume that it is possible to create conditions of full competition without making those who are responsible for the decisions pay for their mistakes seems to be pure illusion." In brief, entrepreneurs are rewarded by markets when they are right and show superior judgment, but punished when they are wrong, a process that rearranges resources continuously in search of greater use efficiency.

CONTRIBUTIONS SINCE SCHUMPETER

The middle twentieth century saw little extension of existing ideas about entrepreneurs and entrepreneurship, perhaps because of a belief that Schumpeter had said it all. But one significant development, "the socialist calculation debate," merits attention because it revolved around the entrepreneur as the central driving force of capitalist process (Hayek 1975, Lavoie 1985).

Sparking the debate was a Mises article (along with one the same year by the famous sociologist Max Weber) that suggested socialism wouldn't work in practice because, absent a market for capital, socialist planners wouldn't

be able to value inputs or outputs rationally (Mises 1975). As much methodological as ideological, the diverse positions helped clarify many unexamined assumptions and issues in then-current economic theory. Schumpeter, who had already decided that socialism lay at the end of the capitalist development road because capitalism's successes create its own eventual downfall, opposed Mises, as did Fred Taylor, Abba Lerner, and Oscar Lange. Mises' argument was picked up and extended by his close associate F. A. Hayek (1899–1992). The debate produced two competing views of economics and human society in which the role and function of entrepreneurs had never been more visible, central, or important. Several variants of entrepreneurship theory also emerged from this clash, including the one stressed and developed by Austrians and their sympathizers, such as Hayek himself, Murray Rothbard (1926–93), G. L. S. Shackle (1903–92), Ludwig Lachmann (1906–90), and Israel Kirzner (1930–).

Fundamental to the clash between the pro- and antisocialist planning protagonists was the issue of equilibrium and how an economy solves the problem of matching rational, cost-minimizing production of goods and services with consumer preferences. For the proplanning writers, the solution was simple: formulating a system of equations and then solving them, taking existing preferences and prices as given data (Lange 1964; but see also Schumpeter 1968, 989, and Hayek 1975, Appendix A). Entrepreneurs aren't necessary in this model of how to determine an economy's output. Not surprisingly, the Austrians took the lead in picking apart the implications of the proplanning approach and began to create a model of the capitalist economy as an ongoing process of discovery, such discoveries being the daily by-product of entrepreneurial activity (Kirzner 1992). As Holcombe (1988) writes:

These activities [research and development] can augment factors of production, but by themselves do not provide the insights that lead to new goods and services, or new processes for producing existing goods and services. If this seems like an overly fine distinction, consider the policy implications. Centrally planned economies tried unsuccessfully for decades to produce growth through investment in research and education, but were missing the institutions that enabled entrepreneurship.

It is entrepreneurs—dispersed, alert and making use of decentralized information—who coordinate economic activity, bring new processes to fruition, combine labor and capital in new or proven ways, and create their individual pieces out of which the economy’s overall, aggregate direction emerges.¹⁴ There is another important but often overlooked advantage to having decentralized entrepreneurs control the economy’s overall direction. Decentralized decisions minimize the harm poor choices can do to the entire economy. Central planning has no such advantage. When the national planners are wrong, the entire economy suffers.

WHAT IS THIS THING CALLED EQUILIBRIUM?

For many writers, the socialist planning debate, as well as the history of the theory of entrepreneurship, depended on the definition of equilibrium, a much-used but often insufficiently defined concept. What precisely does the term mean, and why does it impact various theories so much? (See Kirzner 2000, chapter 13.)

Palgrave’s definition stresses the Austrian contention about the correctness of market participants’ plans:

Economic equilibrium, at least as the term has traditionally been used, has always implied an outcome, typically from the application of some inputs, that conforms to the *expectations of the participants in the economy*. Many theorists, especially those employing the “economic man” postulate, have also required the further condition for equilibrium that every participant be optimizing in relation to those correct expectations. However, it is the former condition, *correct expectations*, that appears to be the essential property of equilibrium at least in the orthodox use of the term. (Eatwell, Milgate, and Newman 1987, 177) [Emphasis added]

Thus, we have a contrast between physical equilibria in an at-rest position, as in a pendulum at rest, and the expectational equilibria in economics that don’t imply rest at all, but a process of fulfilled expectations. This view also implies that equilibrium is something the economy has a tendency to move toward, like “the centre of gravitation of the economic system—it is that configuration of values towards which all economic magnitudes are continually tending to conform” (Eatwell, Milgate and Newman

1987, 179). Does it matter whether we view entrepreneurs as disrupting pre-existing equilibria or as creating new equilibria?¹⁵ It doesn’t, so long as we remember that the concept of general equilibrium is purely theoretical, has never existed and will never exist. Whether there is, in fact, a tendency toward general equilibrium is a discussion beyond the scope of this article. In the physical world, an existing “state of affairs” can be disrupted by entrepreneurial activities even as other entrepreneurs act so as to better coordinate the interrelationships between inventors, producers, financiers, and consumers that the initial disruption created, thus triggering a process that ends in a new and different state of affairs and so on. Therefore, the differing entrepreneurial definitions of equilibrium are reconcilable if we view the concepts “equilibrating” and “disequilibrating” as variations on the central theme of market process rather than as diametrically opposed absolutes.

WHAT ABOUT PUBLIC POLICY AND ENTREPRENEURS?

Understanding the development of the concept of entrepreneurship helps us to better understand our economy and the policy choices that are consistent with maximizing the benefits we derive from the work done by entrepreneurs. This is especially true during periods of upheaval and transition, when the old formulas and measurement devices are called into question because the very nature of what is being measured is changing or has already changed. The current controversies over such empirical issues as measuring productivity, explaining widely divergent and sometimes surprising growth rates, and setting the speed at which the economy can grow without triggering inflation are all dependent in many intricate ways on what entrepreneurs are doing in—and to—the economy. As Greenspan (2000) noted in congressional testimony:

As the U.S. economy enters a new century as well as a new year, the time is opportune to reflect on the basic characteristics of our economic system that have brought about our success in recent years. Competitive and open markets, the rule of law, fiscal discipline, and *a culture of enterprise and entrepreneurship* should continue to undergird rapid innovation and enhanced productivity that in turn should foster a sustained further rise in living standards. [Emphasis added]

A Useful Taxonomy of Entrepreneurial Ideas

Concept	Agreeing	Disagreeing
Risk bearing	Cantillon, Say, Knight (Mises, Menger, Shackle)	Schumpeter, Kirzner
Capital owning	Physiocrats, Smith (Turgot, Mises)	Walras, Clark, Schumpeter, Kirzner
Exceptional people	Say, Mill, Marshall (Shackle)	Kirzner
Leaders	Marshall	Schumpeter, Walras, Clark
Combiner of factors, but not a leader	Walras, Clark	Marshall, Say, Mill
Creates equilibrium	Walras, Clark (Shultz)	Schumpeter
Creates disequilibrium	Schumpeter (Shackle)	Walras, Clark
Innovative	Schumpeter (Thunen, Weber)	Say
More alert	Cantillon, Clark, Kirzner (Menger)	Physiocrats

SOURCE: Based on Elkjaer (1991), with author's additions in parentheses.

In the New Economy—with the always evolving microprocessor and its myriad applications, biotech, and nanotechnologic possibilities—the seemingly simple concepts “input” and “output” are no longer simple. The Old Economy definitions are changing as these new technologies transform how we produce things. During an entrepreneurially driven, transformational time—and some economists argue that this is just such a time—our theories and measurements might undergo a period of Kuhnian “anomaly.” If so, we could find our theories transformed by “extraordinary science,” and the claims for change that at first are resisted and attacked might ultimately become a new status quo.¹⁶

The logical conclusion from this exploration is that an entrepreneur is an ingenious, risk taking innovator who might also be an imaginative manager and whose actions both disrupt and coordinate our market economy. We can, of course, limit the scope of entrepreneurial activity in any economy. But we do so only by bearing the social costs of less innovation, slower growth, and curtailment of our economic freedom. This is always the primary regulatory trade-off—that regulations raise costs, tend to entrench existing technologies at the expense of newer ones, and raise legal barriers to entry by entrepreneurs wishing to compete in those markets. Thus, we would do well to heed the arguments of the writers surveyed in this article concerning entrepreneurs and their vital role as not only the engine of capitalist process, but of capitalist *progress* as well.

Several of the contentions explored above were forcefully stated by former U.S. Treasury Secretary Lawrence Summers (Henig 2000):

What evolution teaches you is that improvements in innovation come in many different forms. That evolution is an invisible-hand process rather than a guiding-hand process. So it inclines one toward a set of public policies that support a very dynamic and competitive economy with a lot of different people trying to do a lot of different things, rather than an approach of trying to have people in an office figuring out what's right and laying out a blueprint for the future.

The essence of the Newtonian system was that you could predict where Saturn would be in A.D. 3800. The essence of a Darwinian system is that you can't make the same kind of predictions. And I think that imparts a certain humility to government as we make eco-

omic policy. On the one hand, it inclines us toward deregulation, and on the other hand, it teaches us that the broadest environment is the best parameter in which evolution is allowed to operate....It's not an accident that Silicon Valley happened in the United States rather than someplace else, it's a reflection of American public policy.

In the very competitive, global marketplace, nations that forget how their entrepreneurs contribute to technological change, productivity, resource efficiencies, and economic growth do so at a potentially high cost (Drozdiak 2001).

NOTES

The author thanks Mark Wynne, Jim Dolmas, Jason Saving, Harvey Rosenblum, Steve Brown, Erwan Quintin, and Evan Koenig for their helpful comments.

- Wolfe's (2000, 17–65) essay “Two Young Men Who Went West” captures, in a way that theory could never duplicate, the combination of chance, motive, attitude, and ability that created Silicon Valley and is a consistently fascinating examination of America's remarkable predilection for creating and nurturing entrepreneurs.
- Elkjaer (1991, 805), quoting Bloch and Wartburg (1950). An even more detailed analysis of the linguistic origins of the term entrepreneur and its use pre-Cantillon is given by Hoselitz (1962).
- Elkjaer (1991, 805), quoting Helene Verin.
- Numerous others considered the new science an

avocation, including Dupuit, Turgot, Smith, Ricardo, Malthus, and Jevons.

- ⁵ Rothbard 1995a, 395. "Cantillon's theory...had failed in one key element: an analysis of capital and the realization that the major driving force is not just any entrepreneur but the *capitalist*-entrepreneur, the man who combines both functions."
- ⁶ This was due, in part, to Charles Gide and Charles Rist's influential *A History of Economic Doctrines*, first published in 1915. Hoselitz (1962, 234) states that it was not until the seventh edition of Gide and Rist's book that they finally gave credit to the Physiocrats and Cantillon, thus changing the claim that this concept had never before appeared in the economics literature. But the sixth printing, cited in this article (Gide and Rist 1927), does not credit Say with authorship of this key economic concept either. Gide and Rist surely were familiar with the history of development of French political economy, making the error all the more inexplicable.
- ⁷ The Liberty Press reissue of the 1976 Oxford edition of *The Wealth of Nations* (Smith 1981) contains no index entry for the term entrepreneur. Smith's reputation among economists has had its highs and lows. Since the bicentennial of his *magnum opus* in 1976, his reputation has been rising once again, having survived much criticism. See, for example, Schumpeter's strong criticisms of "A. Smith" in his *History of Economic Analysis*.
- ⁸ If Ricardo had questions about Say's views, he could have had them answered authoritatively, since the two men carried on a correspondence. But the word "entrepreneur" appears nowhere in that correspondence.
- ⁹ Not everyone agrees that the British classical economists, for the most part, ignored entrepreneurship. See Machovec (1995), chapters 4, 5, and 6.
- ¹⁰ Mill (1976, 406). Mill clearly meant "entrepreneur" in this passage, even footnoting it and lamenting that, in French, it was better stated, although he still used the more familiar English term "undertaker."
- ¹¹ Schumpeter's definition of entrepreneurs and their activities is mostly found in his *Theory of Economic Development* (1961), although it is restated in his *Capitalism, Socialism, and Democracy* (1950, 132–33). See also Mises (1963, 559–63) for a discussion on entrepreneurial errors. Schumpeter's vision of creation on the remnants of destruction was not new. The American economist David A. Wells' 1889 book, *Recent Economic Changes*, argued the same theme but without the catchy phrase "creative destruction" and without discussing in depth its implications, as Schumpeter did. See Perelman (1995).
- ¹² Not all British economists ignored the role of entrepreneurs. See Wicksteed (1967, 367–71).
- ¹³ Knight (1971, 311). This distinction is related to Mises' discussion of case and class probabilities and insurance. See Mises (1963, 107–15). However, Mises had

an especially difficult theory of the entrepreneur, and space does not permit a detailed examination of the differences between that conception and the general use of the term. See, however, Gunning (2001).

- ¹⁴ It seems difficult to believe that, between 1936 and 1945, Hayek published three short essays that revealed just how confused the economics profession was about this constellation of important issues, but see his *Individualism and Economic Order* (1969), chapters 2, 3, and 4.
- ¹⁵ Lewin's (1999) discussion of this issue in the first three chapters of *Capital in Disequilibrium*, and many other aspects of the historical disagreements about what equilibrium has meant to various theorists, is well worth consulting.
- ¹⁶ After Kuhn's (1962) knowledge model as put forth in *The Structure of Scientific Revolutions*.

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Banking and Currency Crisis Recovery: Brazil's Turnaround of 1999

William C. Gruben and John H. Welch

B*razil's commercial banks' high capitalization ratios, shrunken loan portfolios, and expanded holdings of government paper allowed the central bank to take drastic postdevaluation stabilizing measures that calmed markets and created the foundations for a relatively quick economic turnaround without putting the banking system at risk.*

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Although events that lead to currency crises in countries with pegged or fixed exchange rates are the subject of a large and growing body of literature, how countries get out of these crises has received less attention.¹ This article focuses on how Brazil turned around after its 1999 currency crisis. We argue that Brazil's postdevaluation exchange rate was rapidly stabilized and economic recovery began soon after because the banking system had been prepared to withstand not only severe economic shocks but also severe economic policies.

Brazil's commercial banks' high capitalization ratios, shrunken loan portfolios, and expanded holdings of government paper allowed the central bank to take drastic postdevaluation stabilizing measures that calmed markets and created the foundations for a relatively quick economic turnaround without putting the banking system at risk. The Banco Central do Brasil's stabilization policy options were further expanded because Brazilian private sector foreign liabilities were largely hedged in ways that shifted the impact of the devaluation from the private to the public sector.

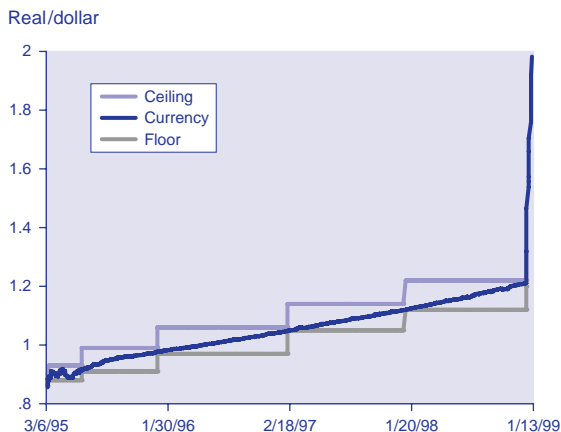
Most exchange rate crises of the 1990s were preceded by banking crises. Tensions sometimes surfaced between looser monetary policy to lower default rates and tighter policy to reduce the inflationary pass-through problems that materialize after a devaluation. Unable to decide what to do, some countries neither stabilized the banking system nor achieved their inflation goals. Other countries simply tolerated giving up one goal to reach the other. In any case, these countries' options were different and more problematic than Brazil's, in part because Brazil and its banks had taken steps to avoid this dilemma of twin crises. To elucidate what permitted Brazil's relatively fast postdevaluation recovery, we begin with an outline of the events leading to the devaluation.

BRAZIL'S REAL PLAN

Brazil had long had severe difficulties with inflation. Even in the 1980s and early 1990s, Brazilian policymakers did not behave as if they appreciated the connections between (1) a problematic tax system, (2) fiscal deficits, (3) printing of money to pay for what taxation could not, and (4) inflation.

Policymakers seemed to perceive inflation as a problem solvable by decree and by indexing the cost of everything from private school tuition to power bills on past price movements. In their periodic efforts to fight inflation, policy-

Figure 1
Wide Exchange Rate Band and Actual Rate



SOURCE: Banco Central do Brasil.

makers would typically freeze wages and prices for a while, stop indexing, and perhaps impose a fixed exchange rate. The unsustainable fiscal deficits behind these problems received less attention.

In 1994 Brazil finally initiated an economic stabilization plan that showed appreciation for the linkage between spending, money creation, and inflation. This Real Plan—named after the new currency, whose exchange rate system would be key to inflation-fighting efforts—temporarily involved indexation. However, the indexation was tied, through the exchange rate, to the number of dollars required to purchase a product rather than to measures of inflation and the currency.

To increase competition and, accordingly, pressures on oligopolies and monopolies that historically had been relatively free to raise prices, Brazil began to liberalize not only foreign investment restrictions but also trade. Brazilian tariffs were lowered from an average of 51 percent in 1988 to an average of 14 percent in 1994.

Brazil took steps against what had become a large federal deficit problem, although they ultimately were not enough. On the expenditure side, the Congress approved a reduction in the funds the federal government transferred to the states and municipalities. On the revenue side, federal income tax rates were increased. Monetary policy was restrained gradually.

As the linchpin of this program, the real was allowed to fluctuate within formally established wide and narrow bands that were periodically adjusted—an exchange rate regime that lasted from 1995 through early 1999. Figure 1 depicts the wider band.

A small, controlled devaluation had been built into the system to accommodate Brazilian

deviations from the U.S. inflation rate and, more generally, some alleviation of ongoing pressures against the currency. As Figure 1 shows, redefinitions were orderly and regular. Aside from some instability during Mexico's financial crisis of early 1995, the path of the Brazilian real was smooth and closely controlled.

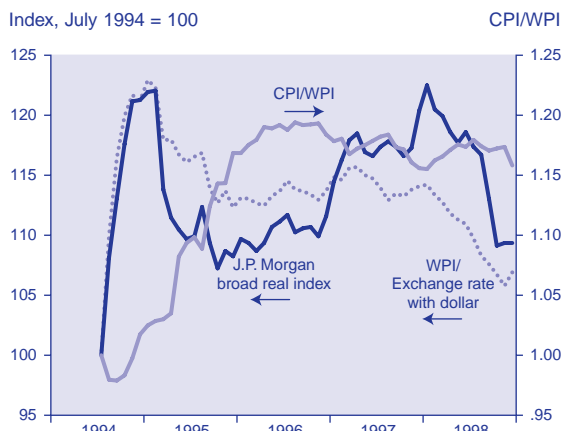
SOME PROBLEMS PERSIST

Despite reducing inflation below zero by the end of 1998, the controlled devaluation built into Brazil's crawling peg was not enough to offset fully the effects of earlier differences between U.S. and Brazilian inflation rates under the Real Plan. Although there is no hard and fast definition of overvaluation and no hard and fast date on which to base the correct valuation from which we here calculate the overvaluation, Brazil's currency had been considered overvalued by 15 to 25 percent. The base period used to calculate the baseline exchange rate has typically been some time in 1994. We use July 1994 because that is when the Real Plan began.

Figure 2 presents three of many approaches to measuring exchange rate appreciation adjusted for inflation-rate differentials and to assessing degree of overvaluation. All three suggest Brazil's exchange rate appreciated after adjustment for inflation. One measure, the J.P. Morgan broad real exchange rate index, shows the inflation-adjusted value of the real appreciating by 22 percent between July 1994 and its peak in early 1998.

Another standard procedure, calculating the ratio of Brazil's consumer price index (CPI) to its wholesale price index (WPI), is designed to capture the changes in nontradable product

Figure 2
Proxies for Currency Overvaluation



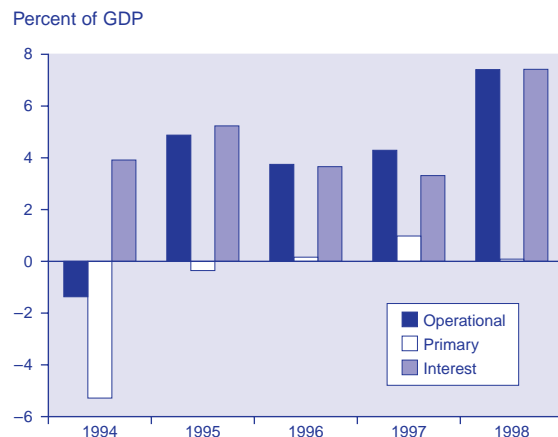
SOURCES: International Monetary Fund; J.P. Morgan.

prices (proxied by CPI) relative to the prices of tradable products (proxied by WPI)—and here reinforces the conclusions one could draw from the Morgan index. A large increase in this ratio is a common symptom of the pressures that culminate in a current-account crisis. As the figure illustrates, this variable shows 1994–98 maximum appreciation of about 18 percent.

A third characterization of exchange rate pressures involves the ratio of the WPI to the nominal exchange rate. As noted above, the WPI may be seen as a proxy for the prices of tradable goods, including exports. When the exchange rate does not adjust sufficiently to avoid large dollar (or other foreign currency-denominated) price increases for such products, foreigners become less interested in purchasing Brazilian products. Current-account pressures can materialize that may be difficult to alleviate without devaluation. Foreign investors know this, become fretful, and demand higher risk premiums, if they invest at all. The maximum appreciation over 1994–98 was about 22 percent.

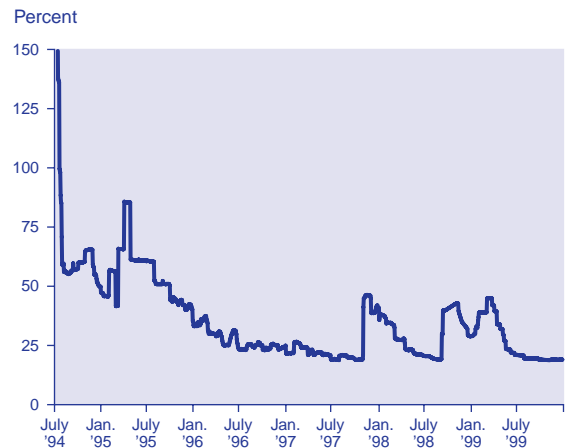
In making these comparisons over time, the starting point of July 1994 is arbitrary in some senses, even though that is when the Real Plan began. However, despite the disparities between the three proxies for exchange rate appreciation, not one suggests exchange rate equilibrium in the year before Brazil’s 1999 devaluation. Note also that each measure falls by year-end. These drop-offs reflect absolute declines in prices (including CPI and WPI) during 1998 and in CPI relative to WPI. By late 1998, these reductions could not offset pressures on the exchange rate.

Figure 3
Brazil’s Fiscal Deficit
While Approaching 1999 Crisis



SOURCE: Standard & Poor’s DRI.

Figure 4
Short-Term Brazilian Interest Rates
(SELIC rate shown, an overnight interbank rate)



SOURCE: Banco Central do Brasil.

Although an assortment of difficulties led to Brazil’s devaluation, one of the most widely recognized was the nation’s growing fiscal deficit—a problem that had never been fully solved despite the efforts expressed through the Real Plan. Figure 3 breaks down Brazil’s government deficit between the portion due to interest payments (interest) and the portion due to the difference between government expenditures on goods and services and the government’s income from taxes and fees (primary). The operational balance is the sum of interest plus primary. The primary deficit is not overwhelmingly large on a year-to-year basis. However, the year-in, year-out persistent accumulation of these deficits by a country that has a history of debt defaults or moratoriums clearly discomfited investors, especially in the context of financial crises in Asia and subsequently in Russia.

The combination of increasing cumulative debt together with investor fears, expressed in high interest rates, resulted in large interest payment portions of the deficit. In 1998, the two parts of the deficit depicted in Figure 3 summed to nearly 8 percent of GDP, of which virtually all was the interest portion. However, concerns quickly grew that the reduction of the primary deficit to almost nil would not last and that the government would return to its less prudent fiscal traditions. Even with the primary deficit reduction, measures of Brazil’s international debt-servicing capacity were very weak.

Brazil did not cause the Asian crises of 1997 or the Russian crisis of 1998. However, Brazil responded to these crises by raising interest rates (*Figure 4*) in hopes of maintaining its

exchange rate and holding foreign capital in the country. Note the 1997 spike around South Korea's financial crises and in 1998 during the Russian crisis.

One result of Brazil's interest rate increases was the drop in Brazil's industrial production index (Figure 5). After ups and downs in 1997, industrial production fell noticeably during the second half of 1998. The high real exchange rate (Figure 2), which makes it hard to earn a profit from foreign sales, also contributed.

Although Brazil's interest rate increases in the wake of the 1995 Mexican Tequila Crisis and the 1997 Asian crises had the expected effect of raising the demand for Brazilian domestic currency and holding foreign currency reserves in the country, interest rate increases after the 1998 Russian crisis had the opposite effect. A fiscal reform package announced in conjunction with the interest rate increases lacked credibility—casting suspicion on the viability of other Brazilian stabilization efforts. Moreover, the interest rate increases forced up nominal fiscal deficits, aggravating existing concerns over sovereign default (Goldfajn 2000).

THE END OF THE CURRENCY BAND

As problems became more acute in 1998 and suspicions mounted about the government's commitment to future fiscal balance, some well-known economists called openly for a Brazilian devaluation (Dornbusch 1998). Although President Fernando Cardoso had worked to bring the national budget into balance early in his first presidential term, during the late 1990s his focus turned toward reelection.

Once reelected in fall 1998, Cardoso again addressed Brazil's budgetary difficulties. At the end of October, Cardoso announced a new budget plan intended to save \$23 billion. Some analysts began to forecast federal primary surpluses for 1999, which might offset deficit problems due to interest payments. In November, a \$41.5 billion International Monetary Fund pre-emptive program was announced. This was intended to warn currency speculators that attacks on the real would not be worth the expense.

However, hopes for exchange rate stability faded as it became clear that many politicians in Brasilia did not share Cardoso's declared commitment to fiscal balance. In December 1998, a deficit reduction bill was voted down in large part by members of the president's own coalition. A significant social security reform effort was voted down for the fourth time. In re-

sponse, the rate of capital outflow from Brazil accelerated rapidly. With Brazilian foreign currency reserves in the \$30 billion to \$40 billion range, down from a more than \$70 billion peak earlier in the year, daily outflows of \$350 million to \$400 million became commonplace.

If a particular event could be said to have triggered Brazil's devaluation, it was most likely Minas Gerais Governor Itamar Franco's announcement in January that he would suspend his state's debt payment to Brazil's national government for three months. This declaration was soon followed by supportive statements from six other governors, who expressed interest in renegotiating their own debt. Since investors' principal exchange-rate-related concerns had been Brazil's ability to maintain fiscal balance, to pay its debts, and to resist the temptation to pay them through monetization, capital outflows accelerated further.

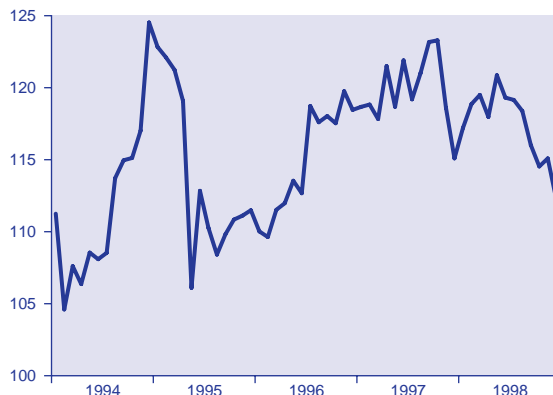
A week after Governor Franco's default announcement, the head of Brazil's central bank resigned and the central bank announced changes in the nation's exchange rate band to allow a 9 percent devaluation. At this time, capital was flowing out of Brazil at a rate on net of about \$1 billion per day, and the 9 percent devaluation announcement did not slow it.

As capital flight continued, rumors circulated rapidly—and were rapidly denied—that the currency would be turned loose from any band or peg. New central bank Governor Francisco Lopes, who held the job about two weeks, repeatedly asserted that the new 9 percent devalued exchange rate band would last in perpetuity.

But just two days after Brazil's new devalued exchange rate band was announced—less

Figure 5
Industrial Production

Index, 1991 = 100



SOURCE: Instituto Brasileiro de Geografia e Estatística.

Figure 6
Brazil–U.S. Exchange Rate During the Crisis



SOURCE: PACIFIC Exchange Rate Service (<http://pacific.commerce.ubc.ca/xr/>).

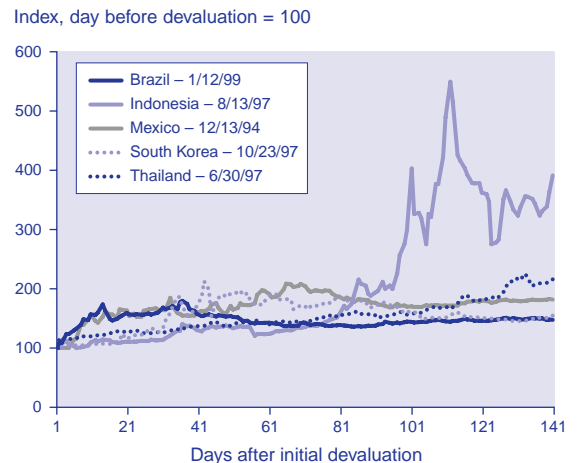
time than it takes some games of cricket to be played—Brazil declared that its exchange rate would be allowed to float after all. Brazil’s official exchange rate arrangement remains a floating regime. Figure 6 represents daily Brazilian exchange rates from December 1998 through January 1999, when the exchange rate system broke down, and on through April. Movements after January 13 alternated between episodes of moderate volatility and stability, but the exchange rate clearly strengthened from its weakest point of 2.11 reals per dollar in early March.

**BRAZIL POSTCRISIS:
EXCHANGE RATES AND OUTPUT**

Figure 7 offers a broader perspective on Brazil’s relatively quick stabilization of the real. The figure depicts the trajectory of indexed exchange rates for five currency-crisis countries of the 1990s. Each nation’s exchange rate with the dollar equals one unit (Brazilian real, Indonesian rupiah, Korean won, Thai baht, or Mexican peso). Despite early volatility, Brazil’s exchange rate stabilizes after sixty-one trading days, while those of Indonesia, South Korea, Mexico, and Thailand are still headed upward. By ninety-one days, Mexico’s exchange rate has begun to stabilize, but Thailand’s is still climbing, as Thai officials are unable to wring uncertainty or inflationary expectations out of the market. By 121 days, South Korea’s exchange rate is as stable as Brazil’s.

To put this exchange rate variance in a clearer perspective, note that—over the first 130 trading days following each of their devaluations—the standard deviation of the index of each country’s exchange rate is as follows: Brazil,

Figure 7
Exchange Rates Through Periods of Devaluation



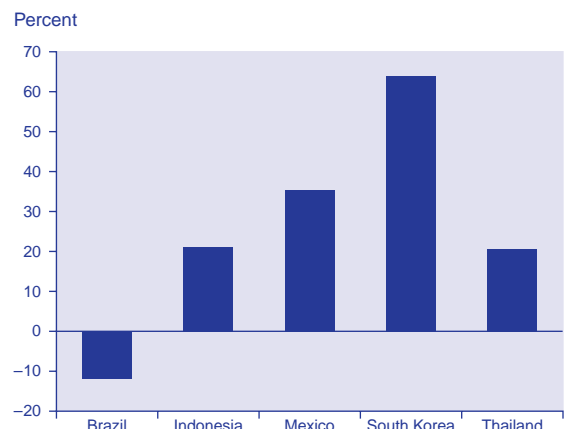
NOTE: Nontrading days are not counted as days on this figure, so 61 days are more than two calendar months and 91 days are more than three calendar months.

SOURCE: PACIFIC.

10.1; Indonesia, 150.8; Mexico, 23.7; South Korea, 20.6; and Thailand, 24.2. Thus, using this measure, Brazil’s exchange rate volatility is less than half as much as even South Korea’s.

Another way of considering exchange rate movements is to exclude the first ten trading days after the original devaluation to show that some exchange rates settle down quickly and others are reluctant to stabilize. Figure 8 presents percentage exchange rate movements for each of the five currency-crisis countries between ten and seventy-one trading days after the initial devaluation.

Figure 8
Postdevaluation Devaluation
(Percentage devaluation relative to dollar between 10 and 71 trading days after initial devaluation)



SOURCE: PACIFIC.

Of the five countries, only Brazil has an absolute decline (signifying a 12 percent revaluation) in the number of domestic currency units traded per dollar over this period. The rest range from a 20.6 percent postdevaluation-date devaluation (Thailand) to 63.9 percent (South Korea). Recall that Brazil's exchange rate was flexible rather than pegged or fixed during this period.

Figure 9 compares postdevaluation industrial production in each of the five countries under consideration, offering another example of the results, in part, of Brazil's stabilization policy—a growth turnaround. The figure presents measures for one through fourteen months following the devaluation month for each country, regardless of when the devaluation took place. The figure shows that Brazil's industrial production response to devaluation and subsequent stabilization policies was more positive sooner than the other countries' responses to their particular devaluations and stabilizations.

In sum, of the five crisis countries under consideration here, Brazil stabilized its exchange rate more quickly than all but (for some measurement periods) South Korea and turned its industrial production up more quickly than any of the other four countries. What permitted the Brazilians to pursue economic stability and allowed an output turnaround so much faster than in the other countries? We argue that an important reason is the stability of Brazilian banks compared with those of the remaining countries.

TWO ROOTS OF EXCHANGE RATE CRISES: BANKING WEAKNESS AND FISCAL DEFICITS

To clarify the connection between bank health and Brazil's recovery from the 1999 currency crisis, we present measures of precrisis fiscal and banking–financial leverage for the five 1990s currency-crisis countries considered in this article and show that every country's crisis was preceded by at least one high-leverage measure. However, Brazil's high-leverage measure did not involve banking. Table 1 presents an overview, offering a matrix of combinations of banking–financial and fiscal leverage.

A large economic literature claims that when countries have high values for banking–financial or fiscal leverage, investors are more likely to remove their financial capital than otherwise. In Table 1, the columns account for the presence or absence of high banking–financial leverage, while the rows account for the presence or absence of fiscal leverage problems.

The term *banking–financial leverage* refers

Table 1
Roots of Exchange Rate Crises

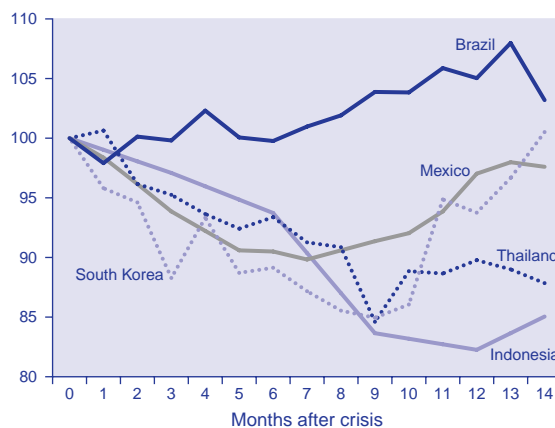
	High banking–financial leverage	Low banking–financial leverage
High fiscal leverage	Indonesia, 1997 Mexico, 1994–95	Brazil, 1999
Low fiscal leverage	South Korea, 1997 Thailand, 1997	

to the quotient of some measure of bank or financial assets divided by the value of something that could allow depositors to get their money out of a bank or away from the country. When the likelihood of getting one's money out of the bank is under question, one logical denominator is bank capital. Low leverage, which in such a case would mean a low ratio of assets to capital, signifies that banks would have enough capital to pay off fleeing depositors if asset-quality problems triggered bank runs. A high ratio could mean that there is insufficient capital to pay off depositors and the government might get the job by default.

Getting one's finances away from a country involves other measures of banking–financial leverage, such as foreign currency reserves. Soon-to-be ex-depositors or ex-investors may wonder whether they can convert their domestically denominated currency into foreign currency at the old pegged exchange rate before the central bank loses so many reserves that it stops defending its currency and devalues. The denominator of

Figure 9
Production in the Crisis Countries

Index, month of crisis = 100



SOURCES: Mexico: Instituto Nacional de Estadística, Geografía e Informática; Brazil: Instituto Brasileiro de Geografia e Estatística; Thailand: Bank of Thailand; South Korea: Korea National Statistical Office; Indonesia: Biro Pusat Statistik; authors' calculations.

a relevant leverage measure could be the volume of foreign currency reserves. A high bank assets/foreign currency reserves ratio might mean insufficient dollars at the erstwhile exchange rate for all ex-bank-depositors who want to get their money out of the country.

Measures of fiscal leverage (upper row of *Table 1*) typically involve some ratio of how much a nation must pay to what it has to pay it with. From the foreign-debt holder's perspective, the narrower issue of whether a country can earn enough foreign currency to pay its foreign-currency-denominated debt is of particular concern. For this category of debt holders, the fiscal leverages of greatest interest will involve a denominator that measures foreign-currency earning capacity.

Table 1 presents combinations of high banking–financial leverage/high fiscal leverage (Mexico, 1994; Indonesia, 1997); high banking–financial leverage/low fiscal leverage (South Korea, 1997; Thailand, 1997); and low banking–financial leverage/high fiscal leverage (Brazil, 1999).² This table, however, is designed only to give an overview.

To more fully elucidate these notions of risk, we begin with characterizations of banking–financial leverage (*Figure 10*). The leverage depicted by the M2/foreign currency reserves ratio is perhaps the international economic literature's most widely used method for characterizing banking–financial fragility's connection to a currency crisis (Calvo 1995; Sachs, Tornell, and Velasco 1996; Kaminsky and Reinhart 1999; Chang and Velasco 2000; and Velasco 2000). This ratio is used as a broad approach for capturing phenomena in which a “prior boom in bank lend-

ing indicates greater weakness in bank balance sheets and, therefore, more vulnerability” (Sachs, Tornell, and Velasco 1996, 150).

The ratio of M2/foreign currency reserves is used as such an indicator because “when capital inflows suffer a reversal, not only do gross inflows dry up, but also, holders of liquid domestic liabilities try to convert them into foreign exchange and flee the country” (Sachs, Tornell, and Velasco 1996, 150).³ Thus, this approach to leverage assessment is of the getting away (from the country) form rather than of the getting out (of the bank) form, both of which are discussed above. Although the sample of countries for which we use this ratio is small, it proxies for a much larger group. Velasco (2000) notes that at the onset of the Asian crisis, the same M2/foreign currency reserves ratio that appears in *Figure 10* was generally higher for Asian economies than for Latin American economies.⁴

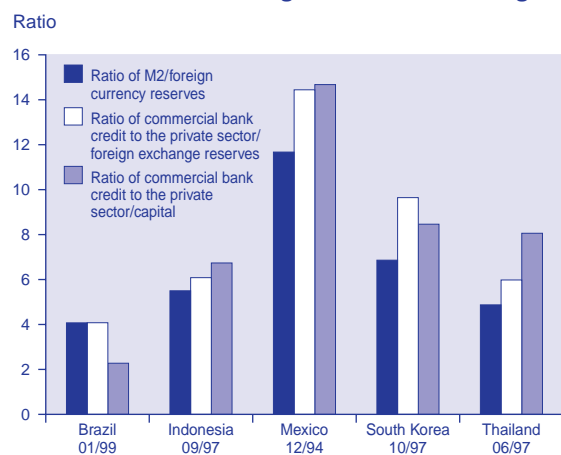
The ratio of commercial bank credit to the private sector/foreign currency reserves offers a second, narrower look at the getting away (from the country) approach to measuring leverage but with the same analytical results. Here again, precrisis bank leverage in Brazil is markedly lower than in the other four currency-crisis countries (*Figure 10*).

These two ratios offer bank leverage measures that are relatively exogenous to government policy. Thus, as crisis conditions materialize, it becomes increasingly difficult for the exchange authorities to manage the size of their reserves.

The ratio of commercial bank credit to the private sector/capital, in contrast, is not only more subject or endogenous to government control than the previous two ratios, but focuses on the getting out (of the bank) problem rather than the getting away (from the country) problem. Even though this measure of bank leverage is very different from the other two ratios depicted in *Figure 10*, it also is lower for Brazil than for any of the other four countries.

In sum, Brazilian banking–financial leverage is relatively low whether we are discussing exogenous measures (M2/foreign currency reserves, commercial bank credit to the private sector/foreign currency reserves) or endogenous measures (commercial bank credit to the private sector/capital). We argue that bank capitalization ratios are relatively endogenous because governments can set and sometimes enforce them. Leverage measures involving foreign currency reserves are more exogenous than capitalization ratios because governments cannot control foreign currency reserves as easily as they can

Figure 10
Three Kinds of Banking–Financial Leverage

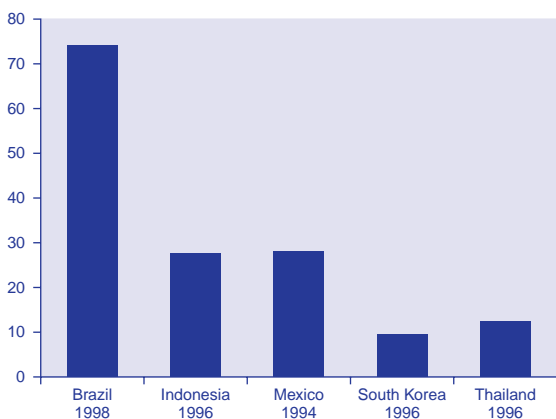


NOTE: Data are seasonally adjusted.

SOURCES: International Monetary Fund; authors' calculations.

Figure 11
Debt Service Ratio

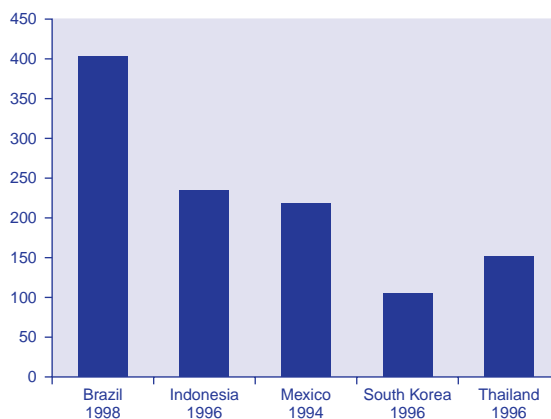
Ratio of debt service to export



SOURCE: World Bank.

Figure 12
External Debt as a Percentage of Exports

Percent



SOURCE: World Bank.

make up and enforce bank capitalization ratios.

Figures 11 and 12 present two widely used measures of fiscal leverage, each of which gauges a nation's ability to earn enough foreign exchange to service its foreign (and, as in the case of the five countries here, foreign-currency-denominated) debt.⁵ In contrast to Brazil's low bank leverage, these fiscal leverages are very high for Brazil and low for such countries as South Korea and Thailand. Brazil's high leverages can be seen in the countries' external debt service ratios (the ratio of countries' foreign debt service payments to the income from exports they use to make these payments) (*Figure 11*) and in the ratio of external debt to exports (*Figure 12*). Note that after Brazil, the other two high fiscal leverage countries are Mexico and Indonesia. Recall that in Table 1 Mexico and Indonesia fall into the category of high fiscal leverage and high banking—financial leverage.

Despite the distinctions we have made between banking—financial leverage and fiscal leverage, either one can signal possible fiscal difficulties. After all, if high bank leverage (particularly as expressed by asset/capital ratios) signals high likelihood that the government will assume bank obligations if asset quality deteriorates, what may really be scaring investors is just another fiscal problem.

BRAZILIAN BANK REGULATION IS TRANSFORMED IN THE 1990S

What brought about the relative strength of Brazil's pre-crisis banking system? As international capital markets began to open in the late 1980s, and as the problematic results of domestic financial liberalizations in the industrial

countries also became clear, concerns increased about the stability of the world's banks. The result was a movement to ensure that banks would be properly capitalized. One manifestation was the Basle Accord, whose eleven signatory nations in 1987 agreed to enforce risk-based capital requirements of 8 percent on all banks within their boundaries.

Brazil was not among the signatory nations of the 1987 Basle Accord but did, in 1994, establish risk-based minimum capital requirements consistent with the accord. In June 1997, as banking problems were materializing in Asia, the Brazilians raised their risk-based minimum capital requirements from the 8 percent Basle Accord standard to 10 percent.⁶ In November, following the onset of South Korea's financial crisis, Brazil raised the requirement to 11 percent. In 1994, moreover, absolute minimum capital limits had been set for any bank, regardless of where these minimums would place it in terms of risk-based capital ratios. Commercial banks could have no less capital than 6 million reais.

Although the legal structure governing the regulation of Brazil's banks was obviously changing, a common problem in Latin America is that those in charge of bank supervision and regulation do not have the power to enforce the regulations on the books. The ability of the Banco Central do Brasil—Brazil's regulatory authority for banks—to cause banks to follow its directives was very limited even during most of the 1990s.

In March 1997, however, new laws permitted the Banco Central do Brasil to demand that a bank with liquidity problems transfer control to new management or reorganize through merger or closure. The central bank could now

appropriate the equity interests of a commercial bank's controlling group and sell it to others. In 1998, the central bank was given new powers to compel financial institutions to implement systems of financial controls, also in accordance with the Basle Committee.

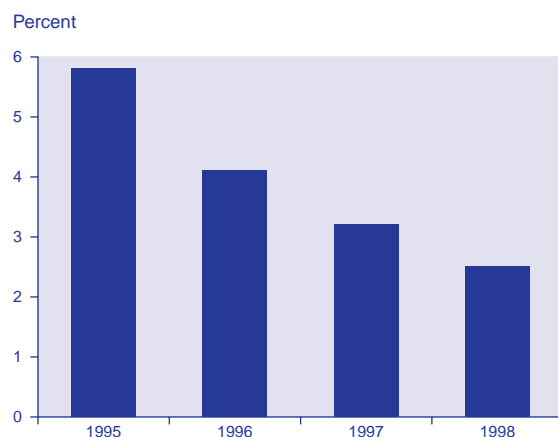
Meanwhile, Brazil took steps to force the privatization of publicly owned banks. Brazil's central bank had long been not only a lender of last resort to the publicly owned banks, but also a routine supplier of capital injections to them. In August 1996, after these institutions' loan portfolios went from bad to worse, Brazil issued new regulations about the conditions for their rescue. Bailouts would take place, provided the banks were either privatized, liquidated, or transformed into development agencies.

Also in 1996 Brazil's government began to permit foreign banks to take control of small financial institutions. In 1997, in the wake of government interventions in larger banks, Brazil allowed foreign controlling interest in these institutions as well. In the conclusion to a study of Brazilian bank efficiency, Bevilaqua and Loyo (1998) argue that, while the new price stability brought on by the advent of the Real Plan in 1994 weaned banks from profiting from float and encouraged them toward greater efficiency, a perhaps more important contribution to bank efficiency was the new competition imposed by the introduction of foreign banks.⁷

GOVERNMENT POLICIES INDIRECTLY AFFECT BANK LEVERAGE

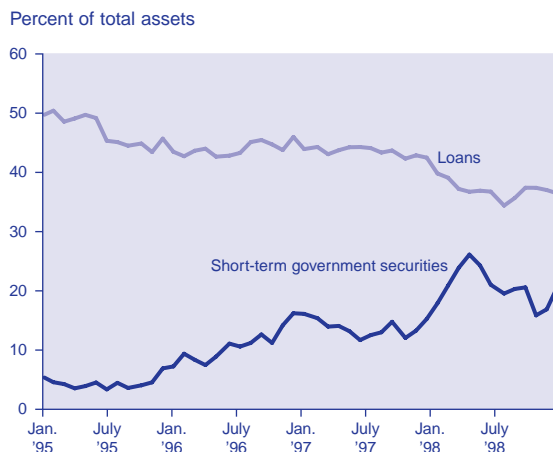
Bank regulation changes and other prudential bank behavior improved bank leverage.

Figure 13
Ratio of Loans to Capital in Brazilian Commercial Banks



SOURCE: Banco Central do Brasil.

Figure 14
Comparison of Bank Loans and Short-Term Government Debt



SOURCE: Banco Central do Brasil.

Some Brazilian government policies indirectly affected leverage also. For example, protracted central bank tightening in defense of the real prior to the January devaluation also encouraged commercial banks to take asset positions that allowed them to withstand the economic turmoil attending most devaluations.

More to the point, as the central bank of Brazil pushed up interest rates to defend the currency during the contagion effects from the Asian crises of 1997 and the Russian crisis of 1998, it not only discouraged borrowing as the economy began to slow but also discouraged lending inasmuch as bankers fear that high interest rates increase the likelihood of default. The result appears to have been a credit rationing, as characterized by Stiglitz and Weiss (1981).

The reduction in loan leveraging, as banks pulled their funds from private sector lending and placed them in high-yield government securities, can be seen in Figure 13, which shows the marked declines in the loans-to-capital ratio in Brazilian commercial banks. To offer another perspective, Figure 14 depicts the ratio of loans to assets and of short-term government securities debt (not including state and local government debt) to total assets. Over the period 1995–98, the share of loans declines while the share of short-term government debt increases. Although reductions in the ratio of bank loans to capitalization would be consistent with the regulatory changes discussed in the previous section, the magnitude of the ratios in Figure 13 requires an explanation beyond such regulations. The portfolio shift depicted in Figure 14 away from loans and toward government

securities provides an explanation for the drop in loans-to-capital ratio.

The reduction in Brazilian bank loan leverage has important implications for the persistent debate regarding the optimum time for a Brazilian devaluation. One argument is that Brazil should have devalued long before it did. However, one virtue of waiting until 1999 is that by then banks had reduced the share of loans in their portfolios sufficiently to endure the tight monetary policy that allowed Brazil to stabilize. The reduction in loans as a percentage of total bank assets was not instantaneous, but required adjustment time in response to tight monetary policies adopted in defense of the currency during 1997 and 1998. In this context, it may be seen that postponing the devaluation resulted in bank portfolios and bank capitalizations that allowed the central bank to persist with tight monetary policies after the devaluation.

There is another more general financial reason why Brazil's devaluation did not cause the Brazilian economy to stagger protractedly. Unlike what happened in the Asian crisis countries, the private sector anticipated Brazil's devaluation for at least a year in advance and hedged against it. For the period of Brazil's devaluation, Banco Central do Brasil data show \$95 billion in private sector foreign liabilities in the Brazilian economy. Of that \$95 billion, \$71 billion was hedged, either through the purchase of such assets as indexed securities (\$60.5 billion) or by taking foreign exchange derivative positions (\$10.5 billion). Partly for this reason—but also because Brazil's foreign exchange crisis did not involve a banking crisis as did those in Mexico, Thailand, Indonesia, and South Korea—floating the real resulted in little bankruptcy and modest balance sheet efforts.

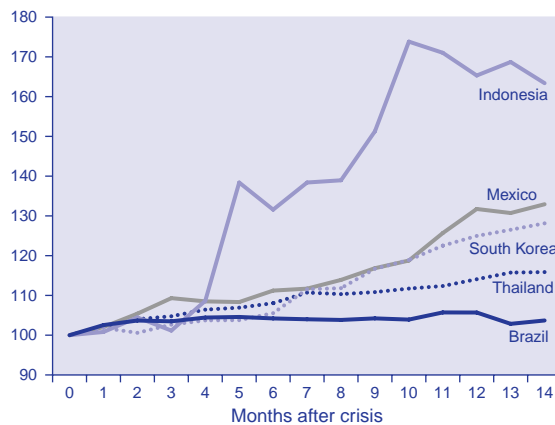
BRAZIL'S TIGHT MONETARY POLICY

We argue that banking sector strength meant Brazil could pursue a tight monetary policy that would hold down inflation and expectations of it for the future. This could stabilize exchange rates and consequently create the investor and consumer confidence to allow the rapid turnaround in industrial production.

Figure 15 depicts postcrisis monetary expansion in each of the five crisis nations. The indicator here is the growth in the monetary aggregate M2 from the month of each nation's exchange rate crisis through the five months thereafter. To permit full comparability, each M2 is constructed consistently with the International Monetary Fund's definitions rather than the par-

Figure 15
M2 in the Crisis Countries

Index, month of crisis = 100



SOURCES: International Monetary Fund; authors' calculations.

ticular nation's own definition of M2.

During the first five months following their respective exchange rate crises, Brazil's and South Korea's monetary expansion rates were markedly slower than those of Indonesia, Mexico, and Thailand—but Brazil's was far and away the slowest. Specifically, cumulative monetary growth for the first five postdevaluation months was Brazil 1.1 percent, South Korea 5.7 percent, Thailand 8.4 percent, Mexico 15.9 percent, and Indonesia 30.3 percent.

CONCLUSION

One of the most striking aspects of the Brazilian devaluation is its difference from those of Mexico, Thailand, and South Korea—among others—in that financial sector weakness did not trigger it. Brazil's January 1999 crisis is closer to first-generation currency crises than to other types. These first-generation crises materialize through rising fiscal deficits under a pegged exchange-rate regime and finite foreign exchange reserves, leading to a speculative attack when lender-imposed credit limits are reached.

The Indonesian, South Korean, Mexican, and Thai crises fit the second-generation model. The literature on such crises emphasizes sudden capital outflows due to changes in market sentiment—a movement from a good equilibrium to a bad one. However, in such cases, it is so common for a banking crisis to precede the currency crisis (see Calvo and Mendoza 1996, for example) that some kind of reckoning of the banking sector liabilities becoming government liabilities seems to be part of the phenomenon.

Whether a necessary connection exists between second-generation models and banking crisis literature, substantial twin crisis literature (for example, Kaminsky and Reinhart 1999, McKinnon and Pill 1996) links these crises in ways that the first-generation models do not.

Based on Brazil's experience, if a country is going to follow the first-generation model on its unfortunate route to a currency crisis, there is much to recommend preparing for the devaluation by strengthening the banking system's capitalization, lowering its loan leverage, and increasing its efficiency.⁸ Taking steps to allow the private sector to hedge against an impending devaluation, as also occurred in Brazil, can similarly aid the subsequent turnaround. Defending one's currency with high interest rates long enough to induce bankers to reduce lending and increase bond holding may be a third approach to preparing for a strong turnaround.⁹

Brazil's experience offers a perspective on the twin crisis literature of the 1990s, in which the focus is on the connection between banking system weakness and a currency crisis. While we think the twin crisis literature has much to recommend it, we have attempted to broaden consideration of the relation between banking system health and currency crises. Not only banking system weakness but also banking system health affects the options governments have in defending their currency or, once the currency is floated, stabilizing it.

NOTES

I wish to thank Jennifer Afflerbach, Kenneth Robinson, Mark Wynne and Carlos Zarazaga for their suggestions for improving this paper.

- ¹ Kaminsky and Reinhart (1999), which is among the most significant and well-known documents on currency crises to appear in years, does raise the issue of factors leading away from crises, but the article's principal emphases are (1) the connections between currency crises and financial crises and (2) the factors leading up to such crises. In Kaminsky, Lizondo, and Reinhart (1998), the emphasis is also on factors leading up to the crises rather than what overcame them.
- ² For discussion of these various combinations of problems, see (for Mexico) Kamin and Rogers (1996), Calvo and Mendoza (1996), Kaminsky (1998), and Kaminsky and Reinhart (1999) and (for the Asian countries) Kodres and Pritsker (1998) and Kaminsky and Schmukler (1999). Complications arise, however. In Kaminsky and Schmukler (1999), fiscal issues most trigger stock market jitters in two countries: Indonesia,

which we would expect, and Thailand, where fiscal problems do not play a role (Table 1).

- ³ The preceding two quotations are Sachs, Tornell, and Velasco's explanations for their use of M2/foreign currency reserves as an indicator of commercial bank-related pressures leading to currency crises.
- ⁴ Extending the explanation of the usefulness of this ratio, Velasco (2000, 10) describes "a situation in which expectations of devaluation generate a sharp fall in bank deposits. Banks lend long and borrow short. Thus, they will not have enough money in their vaults to cover their liabilities."
- ⁵ As examples of evidence that such leverage may scare away foreign investors, Cosset and Roy (1991) and Lee (1993) show inverse relationships between debt service or similar ratios and debt ratings of the large rating services such as Moody's and Standard & Poor's. Dooley (2000), however, develops a model in which debt service cost minimization is shown to be an inefficient policy for governments in developing countries because such policies increase the cost of default.
- ⁶ The idea of risk-based capital requirements is that loans require more capitalization to account for asset recovery problems than, say, government bonds. Accordingly, the weights that express the capital requirement for loans are heavier than for the government bonds. In 1997, when the Brazilians raised the overall risk-based capital requirement to 10 percent, they also increased the weights, so the average capital requirement went up more than was expressed simply by a move from 8 percent to 10 percent.
- ⁷ For a contrast to Brazil's experience, consider the observations of Radelet and Sachs (1998, 30). They note South Korea, Indonesia, and Thailand "had initiated but not completed financial sector liberalization and reform. The partial reforms had led to increasingly fragile financial systems, characterized by growing short-term foreign debt, rapidly expanding bank credit, and inadequate regulation and supervision of financial institutions. These weaknesses, in turn, left the Asian economies vulnerable to a rapid reversal of capital flows." For a perspective on comparative bank conditions, note that two months after each country's devaluation, nonperforming plus in-arrears loan ratios at private commercial banks were Brazil 7 percent, Mexico 12.3 percent, and South Korea 13.3 percent.
- ⁸ Pushing the lender-of-last-resort function offshore—instead of keeping it within the central bank—by inviting foreign banking institutions to operate in one's country would also serve to strengthen the system in this case.
- ⁹ Brazil's adoption of formal inflation targeting as a measure to make its stabilization policy more transparent may be seen as a way of enhancing this credibility further, but in fact markets had already begun to settle down before the introduction of inflation targeting.

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Recovery from a Financial Crisis: The Case of South Korea

Jahyeong Koo and Sherry L. Kiser

A *desirable financial-crisis model should give policy suggestions for handling a downward spiral as well as an explanation for the causes of a financial crisis.*

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Financial turbulence and distress characterized much of the 1990s. The decade began with Europe's exchange-rate crisis of 1992–93 and by 2000 had witnessed two more major financial crises. The unexpected financial meltdown of Mexico, known as the Tequila Crisis, began with the peso devaluation in December 1994. This crisis quickly spread to other Latin American countries. The Asian crisis started with Thailand devaluing its currency in July 1997, reached neighboring countries (Malaysia, Indonesia, Philippines, and South Korea) by the end of the year, then spread to Russia in 1998 and to Brazil in 1999. Even though the causes of the crises varied in each country, the Tequila Crisis and the Asian crisis have a commonality defined by Kaminsky and Reinhart (1999) as a twin crisis—a case when currency and banking woes are linked together. A twin crisis is far more severe than when currency and banking problems occur separately.

These unexpected and severe crises prompted much research that focused mainly on their sources.¹ By identifying the sources, researchers hoped to identify long-term solutions as well as to predict financial meltdowns.² In the endeavor to find the root causes of the Asian crisis, two hypotheses surfaced: the weak-fundamentals view and the financial-panic view, which are not necessarily mutually exclusive.³ Each hypothesis has policy implications for the management as well as the prevention of future crises.⁴

According to the weak-fundamentals view, a country's weakness in macroeconomic or financial fundamentals, or both, causes the sudden reversal of capital flows, and major structural reforms and commitment to continue those reforms are necessary to solve the problems.⁵ The weak-fundamentals view predicts a slow recovery, because it takes time to recognize bank and corporate losses and to allocate the losses among creditors (Dooley 1999).

The financial-panic view considers a crisis as no more than the reaction of nervous markets (Radelet and Sachs 1998, Marshall 1998, and Chang and Velasco 1999). The eruption of a crisis is a shift from one equilibrium to another, and the recovery process is a shift back to the original equilibrium in a model with multiple equilibria. Reducing the cost of coordination failure among lenders is of utmost importance. To restore market confidence, countries need orderly rescheduling of debt and international cooperation. The financial-panic view expects a fast return to the precrisis economy after market confidence is restored.

The recovery process of the Asian crisis countries shows, however, that neither of these theories has effectively addressed the recovery process, especially crisis management. When examining the weak-fundamentals view, it is striking that the recoveries started before the implementation of major structural reforms. The financial-panic view cannot explain the scale of nonperforming loans that still make the countries vulnerable to shocks. According to this view, a short-term debt rescheduling and an injection of ample capital by the International Monetary Fund (IMF), even without huge structural reform, would drive an economy back to the original equilibrium. This has not been the case because the economies have not returned to their original equilibria.

It is important to note that these theories do not provide systematic guidance in blocking a self-reinforcing downward spiral, which occurs after a country is hit by a twin crisis.⁶ Rather than providing insight into the recovery process, these theories seem better suited for suggesting ways of putting the economy into a sustainable economic growth track or building a stable international financial system for the long run. As we see from the experience of Thailand and Indonesia in the wake of the Asian crisis, solutions to restore market confidence for the long run, such as closing troubled financial institutions and abruptly cutting back government expenditure on food subsidies, can exacer-

bate the economic and political conditions and deepen the banking crisis.

A desirable financial-crisis model should give policy suggestions for handling a downward spiral as well as an explanation for the causes of a financial crisis. In this article, we investigate the determinants of the recovery by focusing on market reactions and government policy in the hope that it will formulate a better financial-crisis model. The recovery process, however, differs country by country, depending on the country's economic fundamentals, institutional factors, and the world economic conditions at the time of the crisis. Even though countries may have similar GDP growth rates during the recovery period, other economic variables such as domestic credit growth, inflation, and real-wage growth rate may vary. The study of recovery requires careful investigation of each country's experience before theorizing the process in general. We chose South Korea (referred to as Korea hereafter) as our first country to research because it has demonstrated the fastest recovery among the Asian countries by blocking its downward spiral (*Figure 1*).

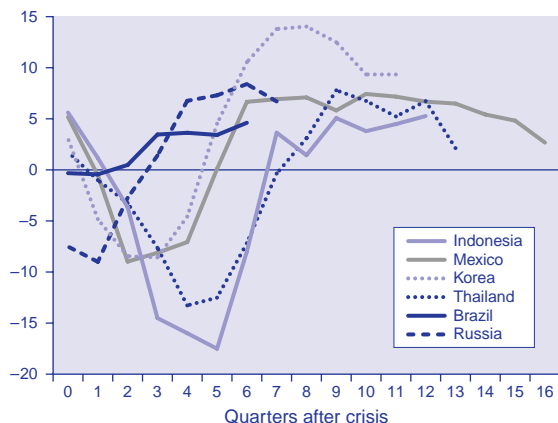
BRIEF REVIEW OF THE EVENTS IN 1997 AND EARLY 1998

In hindsight, the Korean economy had problems, which we may identify as the sources of the crisis. For four decades before the crisis, the Korean government managed economic growth by allocating capital among big conglomerates, called chaebols,⁷ and small and medium-size companies. The government controlled the allocation of financial resources by managing both the commercial banks and the state-owned special banks. The bond and equity markets were relatively underdeveloped, so the banking system generally carried out financial intermediation.

The collusive link among the Korean government, chaebols and the banking industry resulted in inadequate financial supervision and regulations and inefficient use of capital.⁸ The merchant banks, some of which were owned by chaebols, had less regulation than the commercial banks.⁹ As a result of the chaebols' aggressive expansion and lax financial supervision, the debt/equity ratio of the thirty major chaebols was 500 percent.¹⁰ In January 1997, Korea's second largest steelmaker, Hanbo Iron and Steel, was unable to honor its promissory notes, thus forcing it into bankruptcy. The collapse of other mid-size chaebols, such as Kia Motor, Jinro, and Haitai, followed in early 1997. The weakness of

Figure 1
Real GDP Growth after Financial Crises

Four-quarter percent change



NOTE: Dates of financial crises: Mexico, December 1994; Thailand, June 1997; Indonesia, August 1997; Korea, October 1997; Russia, August 1998; Brazil, January 1999.

SOURCES: Mexico: Instituto Nacional de Estadística, Geografía e Informática; Brazil: Instituto Brasileiro de Geografia e Estatística; Thailand: Bank of Thailand; Korea: Korea National Statistical Office; Indonesia: Biro Pusat Statistik; authors' calculations.

the Korean financial and corporate sector had become obvious.

The revealed weakness of the Korean economy along with the speculative attack on the Thai baht exposed the merchant banks' liquidity problems. Since early 1997, Korean merchant banks were having difficulty rolling over their short-term dollar loans. This difficulty was more profound in Korea than in any other Asian country (Ito 1999). Korea's ratio of short-term foreign borrowing to foreign exchange reserves was 285 percent, far above the ratios of other Asian countries. For example, Thailand had a 135 percent ratio and the Philippines, 105 percent. The Korean government offered incentives to domestic banks and large private companies to borrow in foreign currencies for industrial development. The result was severe maturity and currency mismatches: The foreign borrowings were short-term, while the domestic loans were for long-term investments, and the foreign borrowings were in foreign currencies.¹¹

The merchant banks' difficulties penetrated the commercial banks as a crisis erupted in Thailand. The Japanese banks, which were suffering from their lending in Southeast Asia and their growing nonperforming domestic loans, were major players in a widespread withdrawal of loans.¹² Foreign loans to Korea by Japanese financial institutions dropped from \$21.9 billion at the end of 1996 to \$8.8 billion by the end of 1997. In response, the Korean government announced on August 25, 1997, that it was committed to providing financial support to commercial and merchant banks and would ensure repayment of all Korean financial institutions' foreign debt liabilities. The markets, however, did not respond to the commitment of a foreign debt guarantee. The inability to roll over short-

term loans triggered runs in the Korean currency markets. The Korean won began a free fall and depreciated 25 percent in late November from its precrisis level against the U.S. dollar (Figure 2). Currency market intervention left less than \$6 billion in usable foreign exchange reserves when the IMF intervened.

On December 4, 1997, the IMF approved a \$58.4 billion standby arrangement to build foreign exchange reserves. This rescue plan included a range of structural reforms in the financial and corporate sectors to address what the IMF believed to be the causes of the crisis. President-elect Dae-jung Kim approved the IMF reform package, and a tight monetary policy followed immediately. As a result, the overnight call rate shot up to 25 percent (Figure 2).

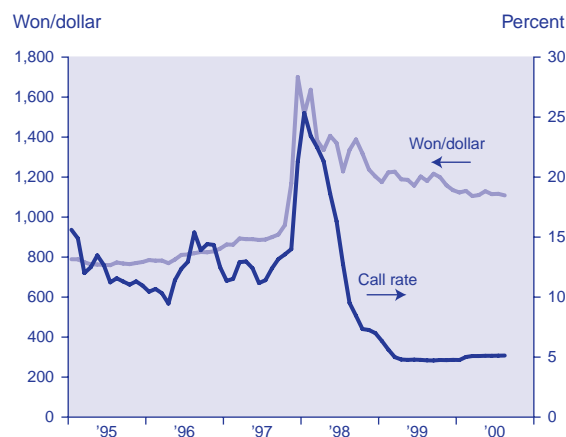
The currency market turbulence quickly crushed the banking sector. By early 1998, most commercial banks and other financial institutions were in technical default due to the severe depreciation and high interest rates. Damage to the economy by the twin crisis and the tight monetary policy was substantial. Real GDP shrank 8.1 percent in the third quarter of 1998 compared with the previous year (Table 1).

CRISIS MANAGEMENT POLICIES AND MARKETS

Currency Markets

In managing a twin crisis, stabilization of the currency market has highest priority because banking sector turmoil cannot be controlled without currency market stabilization. At 13 percent of Korea's GDP, the size of the IMF standby loan to stop a self-reinforcing cycle of capital outflow was unprecedented in the IMF's history.¹³ However, the announcement of the IMF program on December 4, 1997, had a minimal immediate effect on the currency market. The won depreciated further (50 percent of the precrisis level) after the announcement. Since the short-term private debt was so large—about \$70 billion, twice that of the official foreign reserves in mid-1997—the fear was that relying only on the market for a solution was simply too risky. The currency market started to stabilize only after a temporary agreement to maintain exposure was reached with private bank creditors and discussions on voluntary rescheduling of short-term debt were initiated in late December 1997. The U.S. Treasury's role in attaining this nonmarket solution was significant. As Radelet and Sachs (1998) point out, the coordination of creditors by the U.S. government represented a change in the IMF policy. In Indonesia and Thailand, the IMF had used a loan package together with

Figure 2
Won/Dollar Rate and Call Rate



SOURCE: The Bank of Korea.

Table 1

Real Domestic Product and Related Measures

	GDP growth	Inflation	Private consumption growth	Gross fixed capital formation growth	Exports growth	Imports growth
1996 1Q	7.1	5.9	7.6	6.1	20.3	16.8
2Q	6.8	4.4	7.7	5.5	3.5	6.7
3Q	6.5	2.9	6.0	9.3	-7.8	7.7
4Q	6.7	2.8	7.1	8.2	2.1	14.4
1997 1Q	4.9	1.8	4.5	.8	-5.6	3.9
2Q	6.2	1.6	4.4	2.2	7.1	.8
3Q	5.5	2.4	5.3	-3.6	15.6	-3.8
4Q	3.6	6.2	-1.0	-7.2	3.6	-14.8
1998 1Q	-4.6	11.9	-11.9	-19.9	8.4	-36.2
2Q	-8.0	6.3	-13.3	-23.9	-1.8	-37.0
3Q	-8.1	4.1	-12.5	-22.4	-10.8	-39.9
4Q	-5.9	-5	-9.2	-18.3	-5.5	-28.7
1999 1Q	5.4	-5.6	7.9	-4.6	-6.1	8.1
2Q	10.8	-3.5	10.9	4.2	2.5	22.2
3Q	12.8	-4	12.4	6.7	15.1	38.7
4Q	13.0	1.2	12.8	7.2	22.7	44.8
2000 1Q	12.8	-5	10.8	21.9	29.8	51.9
2Q	9.7	-9	8.9	13.2	21.5	38.4
3Q	9.2	-2.4	5.7	10.5	26.5	35.8
4Q	4.6	-2.1	3.2	1.6	6.1	16.2

NOTE: Year-over-year percentage change.

SOURCE: Statistics-Korea.

economic reforms in the hope of returning market confidence without using nonmarket solutions. In January 1998, the Korean government converted \$24 billion of short-term private debt (mostly by commercial and merchant banks) into claims of one- to three-year maturities with government guarantees. The new arrangements halted the won's fall.

To limit capital flight in the wake of the currency crisis, the IMF plan supported a tight monetary policy. The plan assumed that the resultant high interest rates would increase the cost of capital flight and reduce the pressure on the foreign exchange market. The belief was that if left unchecked, exchange rate overshooting would trigger a depreciation-inflation spiral. The continued depreciation could impose substantial burdens on both the corporate and banking sectors, which were already suffering from overexposure to foreign-currency-denominated liabilities. This more traditional way of handling exchange market overshooting kept interest rates high for several months until the tight monetary policy was eased following stabilization of the foreign exchange market (*Figure 2*).

The tight monetary policy severely reduced economic activity. In the third quarter of 1998, private consumption dropped 12.5 percent and private investment decreased 22.4 percent from the previous year. The change in real GDP, -8.1 percent in the third quarter, was considerably larger than the IMF's initial estimate of 2 to 3 percent in 1998 (*Table 1*). Many economists questioned the appropriateness of a tight monetary policy. The IMF argued that vulnerabilities of the Korean corporate and banking sectors to either an interest rate shock or an exchange rate shock were so great that either could have seriously damaged the real economy (Lissakers 1999). There was a growing sentiment among critics of the IMF plan that in the short run, tightening money was not effective in stabilizing the foreign exchange market. They argued that since the Korean government controlled capital outflow reasonably well and the Korean bond market had negligible foreign investment, a tight monetary policy would have a minimal positive effect.¹⁴

An empirical study by Cho and West (1999) shows that a 1 percent increase in interest rates

Table 2

Change of Lending by Commercial Banks to the Korean Private Sector

	Percent change				
	'95/'94	'96/'95	'97/'96	'98/'97	'99/'98
Total	4.7	11.8	9.6	-4.8	26.9
Firms	4.6	10.1	8.3	-2.9	20.1
Households	5.2	16.4	12.9	-9.7	44.8

SOURCE: The Bank of Korea.

results in a 1 percent increase in the won/dollar rate. They point out that the 20 percent increase in interest rates was not enough to offset the 80 percent increase in the won/dollar rate. Park and Choi (1999) show that the effect of interest rates on exchange rates is small and statistically insignificant.

Korea's foreign liquidity position rose as its domestic demand collapsed (*Table 1*), resulting in a 1998 current account surplus of \$50 billion (12 percent of GDP). This surplus helped reduce the net foreign debt (foreign debt minus foreign loans) from \$54.1 billion in December 1997 to \$20.2 billion in December 1998.¹⁵ Even though high interest rates were not the only reason for the collapse of domestic demand, they did dramatically reduce domestic investment and personal consumption. Tight monetary policy and capital market liberalization, which allowed foreigners to buy Korean securities, did not greatly increase foreign ownership of Korean equity and corporate bonds. In 1998, net foreign capital inflow to the Korean equity market was \$4.7 billion. Net foreign ownership of Korean government and commercial bonds was \$0.8 billion.

In summary, the short-term debt rescheduling, the IMF bailout, and the collapse of import demand following a tight monetary policy stabilized the currency market. The tight monetary policy stabilized the market primarily by severely reducing domestic economic activity.

Credit Markets

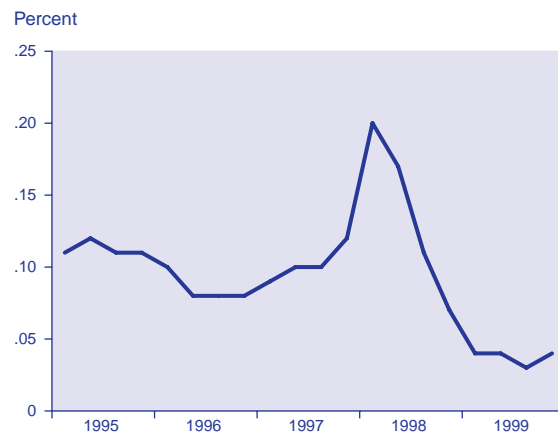
Crisis economies tend to have downward spirals. These spirals begin with defaults in the banking sector and subsequent increases in nonperforming loans, thus making loans to corporations more unlikely and deepening the recession overall. Therefore, after stabilizing the currency market, blocking the downward spiral becomes a major policy objective of twin crisis management. To achieve this, the private sector must have access to credit markets, and individual companies must reduce their financial stress by cutting costs.

Bank Loans. Since bank loans are the major source of private credit in most non-Western economies, the trend in private bank credit is a key indicator of the credit conditions in these economies. The spiral of corporate defaults and decreasing loans lasted less than a year in Korea (*Figure 3* and *Table 2*). In 1998, real lending by commercial banks to the private sector declined 9.7 percent to households and 2.9 percent to firms. In 1999, overall lending by commercial banks to the private sector jumped 26.9 percent in real terms. Korea was able to contain its downward spiral by effectively sustaining bank credits to the private sector. This feature of recovery is notable when we compare bank lending in crisis countries (*Figure 4*).¹⁶

Korea's ability to contain its downward spiral has a lot to do with the government's traditional role as a moderator in the financial market. Shortly after the beginning of the IMF program, two major commercial banks—Korea First Bank and Seoul Bank—were nationalized rather than closed. They required a large capital injection of about 5 percent of GDP. While capital flight was occurring in 1997, the government announced full deposit guarantees for all financial institutions.¹⁷ This policy, together with the nationalization of commercial banks and Korea's fiscal health, prevented runs in the financial sector. Precrisis Korea had a low government debt/GDP ratio of less than 20 percent. Even though the IMF program emphasized the role of private funds in the recapitalization and restructuring of financial institutions, public funds constituted a majority of the money used for these purposes.

About half of the first round of public

Figure 3
Percentage of Commercial Bill Defaults

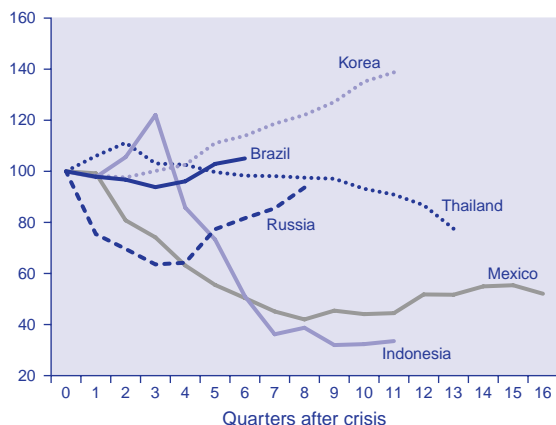


NOTE: Number of defaulted commercial bills/total amount issued.

SOURCE: The Bank of Korea.

Figure 4
Real Commercial Bank Lending to the Private Sector

Index, quarter of crisis = 100



SOURCES: *International Financial Statistics*, International Monetary Fund; authors' calculations.

funds, 32.5 trillion won (\$25 billion, 7.2 percent of 1997 GDP) was used to purchase nonperforming loans. Korea Asset Management Corporation (KAMCO) played a central role in loan consolidation. Deposit payment, recapitalization, and loss coverage had cost 31.5 trillion won (\$24 billion, 7.0 percent of 1997 GDP).

The nationalization of commercial banks and centralized purchasing of nonperforming loans enabled the government to control most of the financial institutions' decisionmaking process. Through its administrative powers, the Financial Supervisory Commission pressured the commercial banks to roll over all existing debt of small and medium-size firms until the end of 1998. From July to November 1998, 89.3 percent of loans to small and medium-size firms were rolled over, accounting for 52 trillion won (\$40 billion), or 36 percent of total loans to firms. Furthermore, the government "encouraged" the banks to lower loan rates to small and medium-size firms and to relax conditions on bank loans. The banks' progress in supporting small and medium-size firms was regularly monitored and reported. As a result, the ratio of loans to small and medium-size firms to total loans to firms increased from 62.6 percent (December 1997) to 64.7 percent (December 1998) and 66.4 percent (October 1999). Considering that credit to small firms generally contracts relative to large firms during recessions and periods of tight monetary conditions (Gertler and Gilchrist 1994), the increased ratio in Korea is notable. The average nominal loan rate to small and medium-size companies dropped below precri-

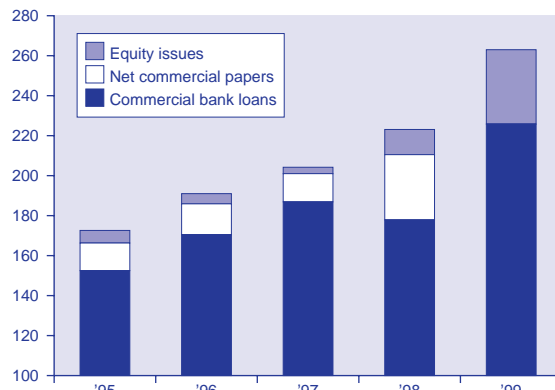
sis level (from 13.27 percent in November 1997 to 12.43 percent in November 1998).¹⁸

Capital Markets. Development of diversified funding sources can soften the shock of a credit crunch. Federal Reserve Chairman Alan Greenspan noted: "Downward spirals can be contained with less damage when corporations find alternative funding sources outside the weakened financial sector. When American banks seized up in 1990 as a consequence of a collapse in the value of real estate collateral, the capital market, largely unaffected by the decline in values, was able to substitute for the loss of bank financial intermediation. Likewise, when public capital markets in the United States dried up following the Russian default of August 1998, dramatic restoration was possible because commercial banks replaced the intermediation function of the public capital markets" (Greenspan 1999).

Korea's credit crunch was mild compared with those in other crisis-struck countries partly because Korea did not remain solely dependent on its banking sector. In 1998, it countered the reduction of bank loans with commercial bond issues. As a result, the overall direct financing of corporations and lending did not decline (*Figure 5*). However, Korea's alternative funding sources did not stem from sound economic fundamentals. Commercial paper composes a minor portion of corporate financing in Korea. But as fresh loans dried up, the conglomerates issued commercial papers extensively to avoid defaults. In 1998, net commercial paper issues jumped 154 percent from the year before and outpaced the decrease in bank loans (*Figure 5*).

Figure 5
Bank Loans, Commercial Papers, and Equity Issues

Unit = trillion won in 1995 price



SOURCE: Financial Supervisory Service, Korea.

With a too-big-to-fail mentality, the investment trust firms, which were under competitive pressure and lax supervision, bought the conglomerates' commercial papers, of which Daewoo was the major issuer. The government was slow in supervising the excessive issuance until the end of 1998.

The technical default of Daewoo triggered the 1999 crisis of investment trust firms. This crisis involved the classic elements of a financial crisis: liberalization, lax financial supervision, and moral hazards.¹⁹ As a consequence, the commercial paper market collapsed and new commercial paper issues dried up. By 1999, the net issue of commercial paper was negative.²⁰ In the fall of 2000, as the due date for the commercial papers issued in 1998 and 1999 neared, the government organized a 20 trillion won (\$15.4 billion, 4.1 percent of 1999 GDP) capital-market stabilization fund to bail out the medium-size conglomerates that did not have credit to roll over their commercial papers.

Equity Markets. In 1999, after the collapse of the commercial paper markets sparked by Daewoo's default, firms achieved access to financing through yet another source: the equity market. With 1999 interest rates the lowest in recent history, equity investment gained tremendous momentum. Labor cost reductions increased expectations of company profits. The government deregulated foreign ownership of Korean equities and simplified stock market transactions. Foreign ownership of Korean equities reached 76.6 trillion won (\$58.9 billion, 21.9 percent of total market value) in December 1999 and increased to 87.7 trillion won (\$67.5 billion, 29.7 percent of total market value) by June

2000. Various types of new mutual funds were allowed. Government funding to venture capital companies, together with the global high-tech boom, boosted stock prices (*Figure 6*). Patriotic slogans were used to stimulate involvement in the stock market, and some chaebols manipulated their stock prices.²¹ In 1999, the Mathew Korea Fund was the best-performing mutual fund in the United States.

In 1999, capital raised by Korean corporations through equity issues reached 39.1 trillion won (\$30.1 billion), which was 23 percent of commercial bank loans outstanding to firms. Private firms' total credit outstanding (bank loans plus net commercial paper issues plus equity issues) increased 19 percent. The rich credit conditions of the private sector, together with a household consumption boom following the stock market boom, led Korea's GDP to grow a spectacular 10.6 percent. By the end of 1999, no one was talking about the downward spiral of the economy.

Labor Markets

During a financial crisis, high nominal wages have a depressing effect on output mainly through greater financial pressures on firms rather than through the conventional labor channel (Bernanke and Carey 1996).²² An inflexible labor market can increase the probability of bankruptcy for cash-poor firms and, in so doing, deepen the downward spiral. Cole and Ohanian (1999) show how rigid nominal wages delayed the U.S. recovery from the Great Depression. During the Great Depression, working hours were not increased and the real wage of labor was not reduced. U.S. institutional factors permitted monopolies and actually raised wages, which in turn led to depressed employment, output, and investment—thus, a slow recovery.

Korean labor markets responded drastically to the financial crisis and subsequent legal and institutional changes. In February 1998, government, business, and workers reached the Tripartite Agreement that facilitated employment adjustment in the Korean labor market. At this time, layoffs were officially codified under the amended Labor Standard Act. The Legislation of the Manpower Lease Act legalized the use of temporary workers. Layoffs immediately following enactment of the codes of the new Labor Standard Act were minimal but signaled the weakened power of the labor unions and the advent of an easier employment adjustment.

Employment adjustments, including layoffs and wage cuts, spread throughout the economy. The unemployment rate shot up to 8.6 percent

Figure 6
Stock Market Indexes in Korea



SOURCE: Statistics-Korea.

by early 1999 (Figure 7). Temporary positions replaced many permanent ones. In May 1998, workers with permanent jobs were 53.1 percent of the total work force. By May 1999, they had dropped to 47.5 percent.

Real employment cost per worker in the manufacturing sector dropped 6.8 percent in 1998, or 2.1 percent in nominal terms (Figure 8). The reduction of the employment cost per worker reflects the nominal wage cuts, replacement of permanent positions with temporary ones, and decreased working hours (Table 3). In the meantime, real value added per worker increased 6.4 percent. As wage growth fell behind productivity growth, the unit labor costs—the ratio of hourly compensation to labor productivity in manufacturing—dropped 20 percent (28 percent in real terms) from 1997 to 2000. A comparison with the U.S. unit labor cost in manufacturing for the same period illustrates the magnitude of Korea's drop. The United States had a 7.3 percent drop in real terms compared with Korea's 28 percent.

The reduction of labor costs helped the companies with heavy debt survive while commercial banks, which were traditionally the main source of finance, were in trouble. Furthermore, once the companies survived the crisis, their higher profits as a result of lower labor costs helped vitalize the equity market. The companies were then able to finance directly through equities. In short, reduction of labor costs led more private firms to survive during the period of financial stress, resulting in a faster than expected recovery.

What does this labor adjustment tell us about the Korean labor market and the recovery

Table 3
Working Hours Index in Manufacturing

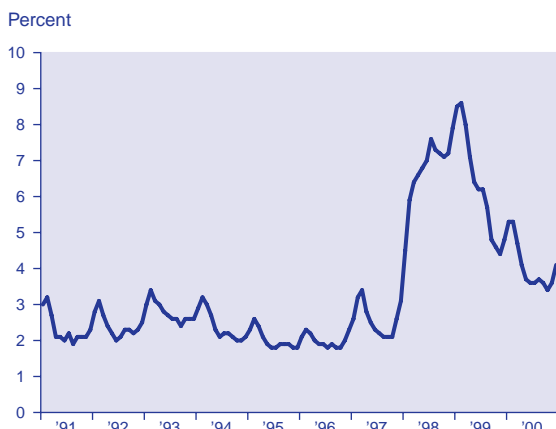
		Working Hours Index	Year-over-year growth rate
1997	1Q	94.5	-2.2
	2Q	98.7	-1.0
	3Q	95.6	-8
	4Q	99.8	-8
1998	1Q	89.4	-5.4
	2Q	94.8	-4.0
	3Q	94.5	-1.2
	4Q	96.2	-3.7
1999	1Q	96.9	8.3
	2Q	103.0	8.7
	3Q	101.1	7.0
	4Q	105.7	9.9
2000	1Q	100.3	3.5
	2Q	99.9	-3.0
	3Q	98.6	-2.4
	4Q	102.2	-3.3

SOURCE: Korea Productivity Center.

process? If we follow the financial-panic view, we derive the hypothesis that the Korean labor market was quite flexible before the financial crisis, and the labor market adjustment was the endogenous response of factor markets regaining original equilibrium. However, if we use the weak-fundamentals view, our hypothesis is that the Korean labor markets were not flexible at the onset of the financial crisis, but they became more flexible and efficient due to legal and institutional changes.

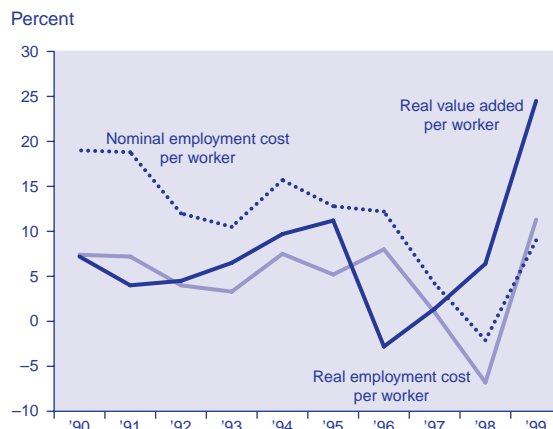
A flexible labor market enables a fast convergence of wages and the marginal product of labor when a shock causes a gap between the two. Using this criterion, the hypothesis based on the financial-panic view is easily negated.

Figure 7
Unemployment Rate



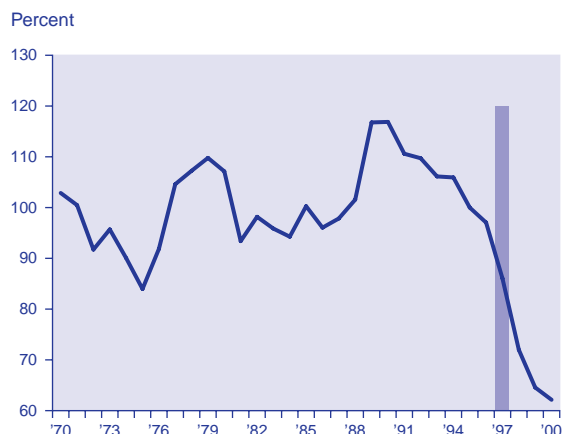
SOURCE: Statistics-Korea.

Figure 8
Growth of Productivity and Employment Cost Measures in Manufacturing



SOURCE: Financial Statement Analysis, The Bank of Korea.

Figure 9
Real Unit Labor Cost in Manufacturing



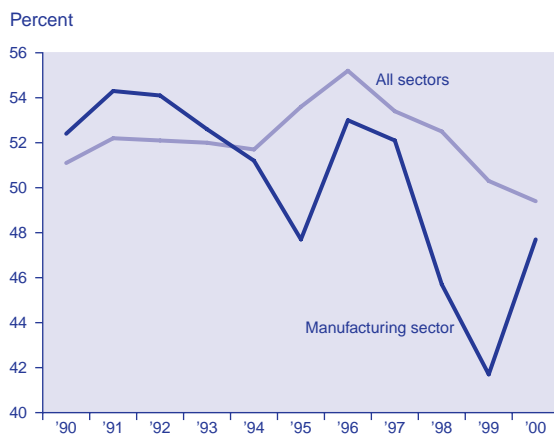
NOTE: Real unit labor cost = unit labor cost/CPI = (hourly wage index/labor productivity)/CPI.

SOURCE: Korea Productivity Center.

The unit labor cost dropped 28 percent in real terms and has not risen significantly since the financial crisis (*Figure 9*).²³ The decline is evidence that either Korean labor earned more than it produced before the crisis or labor now earns less than it produces, or both. None of these interpretations support the financial-panic view hypothesis. Even more evidence negates the hypothesis: The ratio of employee compensation to manufacturing sector income dropped from 52.1 percent in 1997 to 41.7 percent in 1999. The National Income Account reveals this labor-share trend. The overall labor share declined from 53.4 percent in 1997 to 50.3 percent in 1999 and 49.4 percent in 2000 (*Figure 10*). A flexible labor market mechanism does not solely explain this significant procyclical behavior of labor shares. Because profit is more volatile than wage to business cycles, it is natural to expect the labor share to be countercyclical.

To examine the second hypothesis, based on the weak-fundamentals view, we compare the dollar-valued Korean unit labor cost and the U.S. unit labor cost (*Figure 11*). We use the ratio of trade surplus to trade volume between Korea and the United States and set the base year so that the trade surplus is close to zero when the unit labor costs are the same in both countries. The results show that Korean unit labor cost in manufacturing increased dramatically after the 1987 citizens' uprising and resulted in a trade deficit against the United States. When we use the number as a benchmark, it appears that the Korean labor was paid more than it produced during the 1990s until the financial crisis erupted. This supports the weak-fundamentals hypothesis that the Korean labor market was

Figure 10
Labor Shares

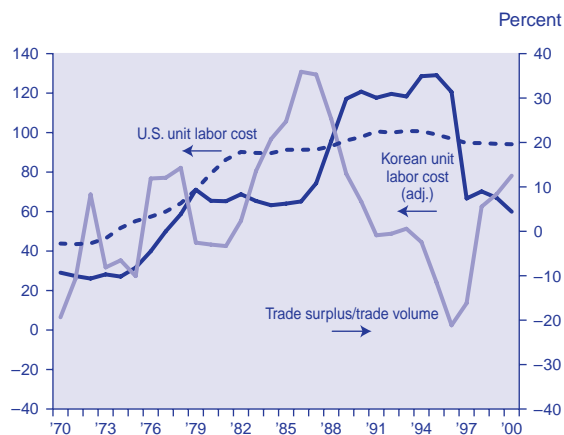


SOURCES: Financial Statement Analysis and National Income Account, The Bank of Korea.

not flexible or efficient before the crisis. However, the second hypothesis alone cannot explain why Korea's unit labor cost is far lower than that of the United States after the crisis.

We need to research further the overshooting of labor cost reductions. However, for now we may consider the following two views in explaining the phenomenon. First, the Korean economy may have experienced a significant structural change, which fundamentally shifted its production function parameters after the crisis. This change is reflected in the shift in labor share. Legal and institutional changes after the financial crisis, an investment boom in the information technology industry, and a rapid change in the composition of Korean export goods due

Figure 11
Korean and U.S. Dollar-Basis Unit Labor Costs, and Ratio of Trade Surplus/Trade Volume



SOURCES: Statistics-Korea; Korea Productivity Center; Bureau of Labor Statistics.

Major Events Related to the Crisis

January 1997	Hanbo Steel defaults on its loans, the first of a string of major corporate failures in 1997.
May 1997	Speculators attack Thailand's baht.
July 1997	The Bank of Thailand announces a managed float of the baht and asks the IMF for technical assistance.
August 1997	Indonesia abandons its managed exchange-rate regime.
October 1997	The Korean won begins to rapidly depreciate.
December 1997	The IMF approves a \$21 billion loan for South Korea, part of a bailout package that will total \$58.4 billion. Dae-jung Kim is elected president of South Korea.
January 1998	International creditor banks and the South Korean government agree to exchange \$24 billion of short-term debt for new loans with staggered one- to three-year maturity dates. The Korean government shuts down a third of its thirty merchant banks.
February 1998	Layoffs are officially codified under the amended Labor Standard Act following the Tripartite Agreement reached by the government and the business community. The Legislation of the Manpower Lease Act legalizes the use of temporary workers.
August 1999	The South Korean government begins dismantling the second biggest conglomerate in the country, Daewoo, which is in technical default.
September 1999	To avoid financial market seizure due to the collapse of the Daewoo group, the Korean government organizes a commercial paper market stabilization fund and raises \$24 billion.
December 1999	President Dae-jung Kim announces the end of the currency crisis.
August 2001	Korea repays its \$19.5 billion IMF loan.

to China's export growth may have all contributed to the structural change. Second, an implicit social contract among laborers, conglomerates, and government may have caused stagnating wages. In 1998, government employees returned 10 percent of their salary to the government for the establishment of funds aiding the unemployed. Private companies also cut wages. When nominal wages are rigid, an implicit social contract can increase the probability of a firm's survival during a crisis period and can improve the employees' welfare if the contract is reasonably well honored after the crisis is over. The 1998 wage cuts were accomplished without serious social conflicts in a nation with a history of notoriously militant labor unions. Korean laborers could have possibly believed that the prolabor government of Dae-jung Kim would guarantee the implementation of the implicit social contract after the crisis was over.

AFTER THE RECOVERY

Korea recovered from its currency market panic after only a year as a result of the IMF bailout, payment reprogramming, a tight monetary policy, and the collapse of import demand. The downward spiral of a credit crunch and corporate defaults was contained remarkably as companies faced lower labor costs and alternative financing sources. Having been the major source of corporate funding, commercial bank lending bounced back, thus helping to contain the downward spiral. The recovery of bank lending to the private sector was a result of capital injection by the government, unlimited deposit insurance, and administrative intervention to promote rollovers to ailing companies. The government's role was not limited to maintaining commercial bank loans. It also fine-tuned capital and equity markets.

The significant role of payment reprogramming, labor adjustment, and government intervention in the markets leads us to wonder whether the Korean recovery process addressed the possible sources of the crisis as the crisis theories do.

After the crisis, the IMF strongly recommended a floating exchange rate. Many economists believed that to prevent future currency crises, there were only two exchange rate regime choices, a floating exchange rate or a fixed exchange rate (currency board or dollarization). But as the currency market panic subsided, Korea returned to a crawling peg system in the hope of keeping a trade surplus and a foreign reserve surplus. In September 2000, the Bank

of Korea had \$92 billion of foreign reserves. Foreign exchange intervention had become a frequent government tool. Bond issues to sterilize the intervention increased to 64 trillion won (13.2 percent of GDP) in 2000 from 22 trillion won (4.8 percent of GDP) in 1997.

Even after the remarkable recovery, which was in part accelerated by low labor and financial costs, the majority of Korean chaebols are still not profitable. In 1999, eighteen of the twenty-seven largest chaebols had financial expenses that exceeded operating profits, and seven of those had not been profitable for three years.²⁴

The accumulated loss in the corporate sector eventually is transferred to the financial sector in the form of nonperforming loans. The government's injection of more than 60 trillion won (12 percent of 1999 GDP) into the financial sector did not reduce the ratio of nonperforming loans to total loans to a comfortable level. When applying forward-looking standards, nonperforming loans in all financial institutions were 14 percent in June 2000. It is expected that the burden of government will continue to grow unless the chaebols' profitability improves dramatically.

Problems with fiscal debt are also surfacing. In precrisis days, the government had no problems issuing bonds to inject money into the financial sector and to provide unemployment insurance. However, the crisis pushed up the government debt to 40 percent of GDP in 2000. With financial and corporate restructuring still in progress, the debt will rise.

CONCLUDING REMARKS

What matters most in management of a twin crisis is stabilizing the currency market and containing the downward spiral. Korea was able to manage the twin crisis, and Korea's macro variables—such as GDP growth, unemployment rate, inflation rate, and current account deficit—improved tremendously shortly after the crisis broke out.²⁵ However, corporate profitability and nonperforming loans have not adequately improved, and the precrisis foreign exchange regime has returned. These were the very conditions that were blamed for the crisis.

The Korean government did not wait for market confidence to stabilize the financial markets. Instead, it aggressively controlled the financial institutions to keep the country's credit system intact while pursuing gradual structural reform. In this regard, the Korean government did not thoroughly follow the policy implications of the weak-fundamentals view that focus on prompt structural reform and recapitalization of the financial sector. Companies were able to survive the crisis partly because real wages did not increase as much as labor productivity. The labor market dynamics and fast recovery, however, do not necessarily support the recovery feature of the financial-panic view. Korean labor markets were not flexible and efficient before the crisis, and labor adjustment overshot after the financial crisis.

Korea's recovery was only possible after it gained control of its currency crisis. Interestingly, the recovery process affirms neither the weak-fundamentals view nor the financial-panic view. Although some weak fundamentals were addressed after the crisis, the recovery was in motion before the fundamental problems were secured, and Korea continues to struggle with structural weaknesses that were present before the crisis. The financial-panic view also does not adequately explain what took place in Korea. Calming nervous investors so that conditions would stabilize and return to precrisis levels isn't what happened. Conditions stabilized, but they did not return to precrisis levels. A combination of factors in crisis management

contained the downward spiral. Korea can attribute much of its recovery to the creation of alternative funding sources and labor adjustments.

NOTES

The authors would like to thank Gon-yung Park, Erwan Quintin, Mark Wynne, and Carlos Zarazaga for their insightful comments and suggestions.

- ¹ Innumerable papers deal with the causes of the Asian crisis, many of which can be found on Nouriel Roubini's home page, <http://www.stern.nyu.edu/~nroubini/asia/AsiaHomepage.html>.
- ² Eichengreen (1999), for example, argues, "Proposals for reforming the international financial architecture make sense only if they address the fundamental causes of financial crises."
- ³ Glick (1999) shows that a financial panic can occur as a result of weak financial fundamentals. We also can construct a model illustrating that financial panic leads to a collapse of the financial system. While recognizing the possibility of "observational equivalence," we interpret each view as arguing that weak fundamentals or financial panic, respectively, can explain the majority of damage the economy suffered.
- ⁴ Zarazaga (1999) asks whether these theories are examples of Monday morning quarterbacking, especially in the sense that the theories may not be useful in forecasting future crises.
- ⁵ Goldstein (1998) and Krugman (1998) point out that implicit guarantee of deposits in financial institutions of emerging market economies invited too much capital inflow. The crisis, or massive capital outflow, they argue, happened when foreign investors suddenly realized that their lending to local financial institutions was not actually guaranteed. Burnside, Eichenbaum, and Rebelo (2000) argue that large prospective deficits stemming from guarantees to failing financial sectors tend to cause twin crises.
- ⁶ A downward spiral occurs when a recession forces corporations to delay or default on their bank payments. As the amount of nonperforming loans rises, banks' cash flows are squeezed, forcing them to halt new lending to illiquid corporations and to call in even good loans to raise cash, all of which further deepen the recession.
- ⁷ See Hunter (1999) on the history of chaebols, large family-controlled industrial conglomerates, and the role of capital allocation.
- ⁸ Borensztein and Lee (1999) empirically show that bank and foreign loans were not directed to the relatively more profitable industries in Korea (1970–1996).
- ⁹ Korea's merchant banks specialize in short-term corporate lending and have different regulations and structures than commercial banks. Korean chaebols typically financed their capital expenditures by borrowing from commercial banks. However, they often

financed their working capital by issuing promissory notes. When suppliers needed paying, they turned to merchant banks, which discounted the note and gave them funds. Precrisis, the merchant banks generated easy profits with their aggressive investments in South-east Asia, Russia, and other emerging markets. However, these risky investments turned into a \$3 billion loss by late 1997.

¹⁰ The debt/equity ratio in Taiwan is about 120 percent, and the norm for industrial countries is below 200 percent.

¹¹ The maturity mismatches by Korean merchant banks were riskier than the mismatch of other deposit institutions because the number of depositors (foreign lenders) was smaller than in other types of deposit institutions, such as commercial banks.

¹² Japan's response supports the premise that Korea's liquidity problem was triggered by the contagion from Southeast Asian countries rather than by intrinsic problems within its economic structure.

¹³ The standby loan, \$58.4 billion, was financed as follows: IMF (\$21.1 billion), Asian Development Bank and World Bank (\$14.2 billion), and others (\$23.1 billion). The \$23.1 billion was a "second line of defense" from individual donor governments such as the United States, Japan, and Europe, a small portion of which was eventually delivered. See Lane et al. (1999).

¹⁴ Furman and Stiglitz (1998) argue that during a period of high interest rates, exchange rate movement depends on the strength of the offsetting movements in the promised rate of return, the probability of bankruptcy, and an increase in the risk premium. If high interest rates bring about investor confidence in the monetary authority, they can help stabilize the exchange market. However, if the reverse takes place, the exchange rate could be permanently weakened. Goldfajn and Gupta (1999) analyze eighty countries and show that high interest rates stabilize the exchange rate following a currency crisis. However, they find in their sample that the relationship between high interest rates and exchange rate stability is insignificant when a banking crisis follows a currency crisis.

¹⁵ The IMF money was not used to pay back private foreign loans. Most of it was set aside as foreign reserves and returned to the IMF by the end of 1999.

¹⁶ For example, the Korean case is strikingly different from the case of Mexico. Mexico has experienced a continued reduction of bank loans to the private sector since the economy was struck by the crisis at the end of 1994. The Mexican economy bounced back because of the extension of foreign credit to the export industry. Mexico's GDP fell 6.2 percent during 1995, but the GDP grew 5.2 percent in 1996 and 7 percent in 1997. (See Krueger and Tornell 1999 regarding the role of export to the recovery of Mexico's economy.) As fresh loans dried up, nontradable sector companies and households suffered severe credit deficiencies. The downward spiral continued more than five years in

the nontradable sector while export industries flourished.

The result was an asymmetric recovery with a huge gap between the tradable and nontradable sectors.

¹⁷ The Korean government reduced the guarantee to a maximum of 50 million won per person beginning in 2001.

¹⁸ Source: Financial Supervisory Service, Korea.

¹⁹ Gruben, Koo, and Moore (1999) show how financial liberalization can lead to supracompetition and risky behavior in commercial banking sectors when sound supervision does not exist.

²⁰ Net commercial paper issue is equal to the value of new issues minus the value of the redemption of previously issued paper.

²¹ Hyundai Securities was eventually indicted for this type of operation. It boosted its affiliates' stock prices by manipulating its mutual fund, the Buy Korea Fund.

²² In the conventional labor channel, high real wages decrease equilibrium output as firms decide production at the point where real wages equal the value of the marginal product of labor.

²³ The won unit labor cost has declined since 1991. The 1987 citizens' uprising greatly strengthened the bargaining power of Korea's labor unions. As a result, the unit labor cost accelerated. The decline of the labor cost before the financial crisis can be attributed to the slow adjustment process of labor markets to the political shock of the uprising. It is also worth noting that Korea's dollar unit labor cost did not decline before the crisis (*Figure 11*).

²⁴ Source: Financial Supervisory Service.

²⁵ Mild decline of the GDP deflator in 1999 and 2000 (*Table 1*) partly comes from the stabilization of the Korean currency. The consumer price index does not show deflation during the period.

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