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**Understanding East Asia's Financial Crisis:
Insights from Agency Theory**

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Abstract
Understanding East Asia's Financial Crisis:
Insights from Agency Theory

For some time, India has been under pressure to adopt the "East Asian" model of growth and development. As developed initially with great success by Japan, this model emphasizes the use of targeted market prices to achieve accelerated rates of saving and investment, a strong role for the rapid growth of manufacturing, and a major reliance on high-technology export-led growth to achieve sustained high rates of increases in per capita income. Indeed, it is precisely this model that characterized the economic policies among the Asian "tiger" economies. Its apparent success also has been a driving force behind proposed economic reforms in China and India.

The "East Asian" model of economic growth now raises fundamental questions. Beginning with the crash of the Hong Kong stock market crash in late summer of 1997, South Korea became the first of the Asian "tiger" economies to experience both financial and economic collapse. With South Korea's appeal to the International Monetary Fund to provide emergency stabilization funding, what has been viewed as the "East Asian" model of growth and development is now in doubt.

For the past several years, India has begun a process of economic reform built along the lines of the East Asian model. Since this is now open to question, a key question is whether Indian economic reforms now under way can proceed in continued emulation of the East Asian model or whether an alternative approach may be more appropriate. What is clear is that India seems thus far to have escaped some of the more extreme consequences of the financial and economic turmoil of the East Asian countries, as measured by relative changes in stock market prices and foreign exchange rates.

Standard approaches to adjustment emphasize the role of restoring credit and liquidity balances to the banking sector. As promulgated by the IMF package put forth in South Korea and in Indonesia, this includes not only the immediate transfer of funds to meet short-term credit obligations, but also an emphasis on banking and corporate liberalization, and on currency devaluation. While these measures seem to have had some success elsewhere, as in the resolution of the Mexican crisis in the early 1980's, the longer term challenge is to develop institutional rules that provide a more accurate measure of risk to economic agents.

In this paper, I propose an agency model to argue that longer term solutions to financial crises such as what we now see in East Asia can only be devised through the adoption of accounting rules that provide measurable transparency in financial and productive decision-making. In so doing, I plan to shed light on the kinds of economic reforms that Indian authorities may need to consider in light of the East Asian financial and economic crisis, and how these reforms may be compared with and contrast to past and current policies in India.

Introduction

When one looks for successful models for economic growth and development over the past twenty-five years, the region most often cited is East Asia. If one considers the experience of Japan, South Korea, Hong Kong, Singapore, Malaysia, Taiwan, Thailand, and Indonesia, it is clear that these countries have achieved extraordinary rates of growth in per capita income. Indeed, the apparent success of the "Asian" model has generated increasing favor in China, India, and in other developing countries outside the region. What has dramatically changed this image is the East Asian financial crisis that began in the latter half of 1997 and continues to unfold.

The East Asian financial crisis appears to have turned the “Asian” model upside down. Beginning first with the collapse of foreign exchange and equity markets in South Korea, Hong Kong, and Indonesia, East Asia’s financial crisis has led to economic contraction, rising inflation and unemployment, and has spread to other regions of the global economy. Since the “Asian” model is now open to doubt, it is instructive to ask why this turn of events has come about and what corrective policy measures are appropriate. With this basic question in mind, this paper examines the common and distinctive features of key East Asian economies, and the reasons for both their success and recent crisis.

How significant is the East Asian financial crisis and on what basis is economic reform now proceeding? We can take stock of the events of 1997 in several steps. We look first at the relative importance of the East Asian region to the global economy. Second, we identify what policy elements the successful economies in East Asia share in common. Third, we examine benchmark indicators of the financial crisis of 1997. Fourth, we present a critical examination of standard approaches to economic and financial reform. Finally, we present a framework for policy reform based on a model in the presence of imperfect information. As will become clear, contract incentives designed to improve the level and distribution of market information are essential if policy reforms are to succeed in restoring East Asian countries to sustainable economic growth.

The Global Economic Importance of East Asia

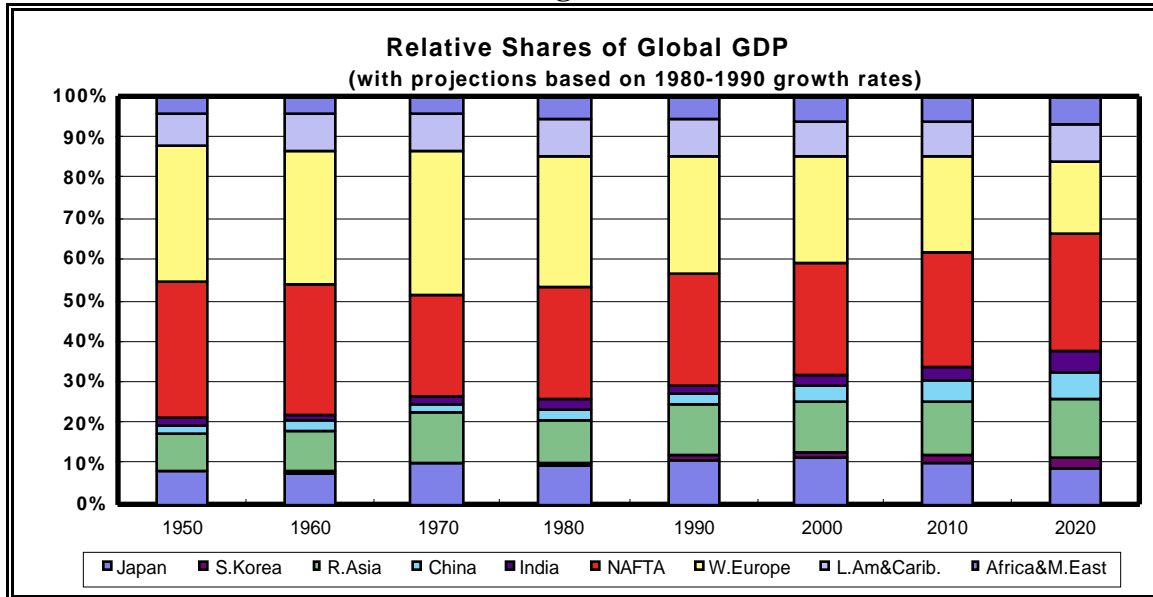
How important is East Asia to the global economy? Figure 1 illustrates the role of East Asian economies to global trade and investment. Until recently, almost all of the economies in East Asia were growing at rates well above their historical trends, and above those of most other regions of the world. Were these rates to continue, East Asia seemed destined to become the economic leader in the 21st century. Indeed, books on the East Asian economic “miracle” have become a near cottage industry serving policymakers and the international business community.¹

By 1990, East Asian countries net of Japan, China, and India already accounted for the third largest grouping of countries after NAFTA and the European Community. Adding China and Japan made the region the second largest as of 1990, while the addition of India would make it the largest single grouping as of that date. At these rates, inclusive of Japan,

¹ See, for example, Edmund T. Gomez and J.S. Jomo, *Malaysia’s Political Economy* (Cambridge: Cambridge University Press, 1998); Paul Krugman, *Pop Internationalism*. (Cambridge: MIT Press, 1996); ; Hal Hill, *The Indonesian Economy Since 1966*. (Cambridge: Cambridge University press, 1996); Ezra Vogel, *Japan as Number One in Asia*. (New York: Columbia University Press, 1994); Laura d’Andrea Tyson, *Who’s Bashing Whom? Trade Conflict in High-Technology Industries* (Washington, D.C.: Institute for International Economics, 1993); Hiroyuki Odagiri, *Growth Through Competition, Competition Through Growth: Strategic Management and the Economy in Japan*. (New York: Oxford University Press, 1992); Paul Krugman, editor. *Trade with Japan: Has the Door Opened Wider?* (Chicago: University of Chicago Press, 1991); Kozo Yamamura, editor. *Japan’s Economic Structure: Should It Change?* (Seattle: Society for Japanese Studies, 1990); Akio Morita, *International Economic Cooperation and Domestic Realities: International Business as a Partner in Dialogue*. (New York: The Trilateral Commission, 1990); A. Amsden, *Asia’s Next Giant: South Korea and Late Industrialization*. (New York: Oxford University Press 1989); Clyde Prestowitz, *Trading Places: How We Allowed Japan to Take the Lead*. (New York: Basic Books, 1988); Lester C. Thurow, “The Case for Industrial Policies in America”, in Toshio Shishido and Ryuzo Sato, editors, *Economic Policy and Development: New Perspectives*. (Dover, Mass.: Auburn House, 1985), pp. 225-59; Richard Schonberger, *Japanese Manufacturing Techniques*. (New York: The Free Press, 1982); Ira Magaziner and Robert Reich, *Minding America’s Business*. (New York: Harcourt Brace Jovanovich, 1982). Ezra Vogel, *Japan as Number One* (Cambridge: MIT Press, 1979). Krugman’s 1996 book takes much of the U.S.-Asia literature to task for embracing misguided industrial policies to counter Japan’s success in mercantile trade.

South Korea, and China, the East Asian share of global GDP would account for almost a third of projected global GDP by 2020.

Figure 1



Source: The World Bank, *World Development Indicators 1997, World Tables*, selected years, and author's projections.

As impressive as East Asia's historical growth has been, as long as the financial crisis that unfolded in 1997 remains serious and unexplained, the appeal of East Asia's economic policies will be a qualified one. Moreover, there are significant structural and policy differences among the economies of East Asia that need to be taken into account. These differences help to explain why the financial crisis has not struck uniformly in all countries.² We add also the fact that since East Asia also is the most populous region of the

² For measures of regional economic integration, see Imbad A. Moosa and Razzaque H. Bhatti, "Are Asian Markets Integrated? Evidence for Six Countries Via-a-Vis Japan", *International Economic Journal* 11(1) (Spring 1997), pp. 51-67; Lin Show Chen and Lin Jyh Wu, "Sources of Real Exchange Rate Fluctuations: Empirical Evidence from Four Pacific Basin Countries" *Southern Economic Journal* 63(3) (January 1997), pp.776-87; Imad A. Moosa and Razzaque H. Bhatti, "Does Real Interest Parity Hold? Empirical Evidence from Asia", *Keio Economic Studies* 33(2), (1996), pp. 63-70; Ramkishen Rajan, "Singapore's Bilateral Merchandise Trade Linkages with Japan and the United States: Trends, Patterns, and Comparisons", *Asian Economic Journal* 10(2) (July 1996), pp. 133-63; Suzanne Berger and Ronald Dore, editors, *National Diversity and Global Capitalism*. (Ithaca, New York: Cornell University Press, 1996); William E. James, "International Finance and Domestic Financial Market Development: The Case of Indonesia", *Asian Development Review* 14(1) (1996), pp. 131-61; Raj Aggarwal and Mbodja Mougoué, "Cointegration Among Asian Currencies: Evidence of the Increasing Influence of the Japanese Yen", *Japan and the World Economy* 8(3) (September 1996), pp. 291-308; Sung Hee Jwa, "Capital Mobility in Korea Since the Early 1980's: Comparisons with Japan and Taiwan", in Takatoshi Ito and Anne O. Krueger, editors, *Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flows* (Chicago: University of Chicago Press, NBER-East Asia Seminar on Economics, vol. 3, 1994), pp. 123-64; Sung Yeung Kwack, "The Rates of Return on Capital in the United States, Japan, and Korea, 1972-1990", in *The Korean Economy At A Crossroad*. (Westport, Connecticut: Greenwood Press, 1994), pp. 57-71; David T. Mason, "The Impact of Trade Blocs on the Future of Japan's Relations with China", in David T. Mason and Abdul M. Turay, editors, *Japan, NAFTA, and Europe: Trilateral Cooperation or Confrontation?* (New York: St. Martin's Press, 1994), pp. 195-218. While many East Asian countries have pursued export strategies

globe, even with impressive rates of growth, per capita income in countries such as China and India still have a long way to go before they reach the levels of Japan, Singapore, Western Europe and North America. As such, the data in Figure 1 can serve only as a first order indication of the growing importance of East Asia to the global economy.

Common Elements in Macroeconomic Policy in East Asian Economies

While there are differences in economic policies among East Asian countries, let us look first what common elements that they share and how they have contributed to their regional success. There are five key ingredients in the “Asian” model, each of which may be viewed in relation to economic policies in other regions of the world: 1. fostering high rates of domestic saving and investment; 2. emphasis on export led growth; 3. keeping tax and government spending rates relatively low; 4. keeping inflation and unemployment rates fairly low; and 5. fostering the transfer of technology from developed economies to developing countries in the region. As such, this model emphasizes a minimal dependence on international public aid, and on international direct and portfolio investment in the region. What it has required, is periodic domestic intervention in various stages of transition, either by government incentives, or through the selection of key industries to manage the restructuring of economies to globally competitive standards.

Table 1
Comparative Regional Economic Indicators

	1960	1965	1970	1975	1980	1985	1990	1995
Five-Year Annualized Real GDP Growth Rate								
China	4.81%	5.00%	5.20%	5.78%	5.52%	9.72%	7.57%	12.90%
E.Asia & Pacific	3.87%	5.60%	8.10%	8.00%	8.00%	7.95%	7.90%	9.40%
L.America & Caribbean	4.10%	5.00%	6.10%	5.20%	5.20%	2.97%	1.70%	3.60%
Sub-Saharan Africa	5.63%	5.20%	4.80%	3.30%	2.80%	2.18%	1.70%	0.90%
Consumer Price Index Five-Year Annualized Growth Rate								
China	0.20%	2.20%	1.62%	1.20%	2.59%	4.15%	13.07%	8.40%
E.Asia & Pacific	3.00%	3.10%	4.13%	5.50%	6.20%	7.00%	9.90%	9.90%
L.America & Caribbean	9.00%	12.00%	14.94%	18.60%	39.41%	83.50%	179.40%	482.80%
Sub-Saharan Africa	3.00%	3.40%	4.08%	4.90%	9.92%	20.10%	18.80%	39.20%
Gross Domestic Saving Rate								
China	10.00%	10.00%	28.77%	30.56%	32.18%	34.49%	42.50%	44.00%
E.Asia & Pacific	14.00%	11.00%	25.60%	27.70%	30.70%	31.00%	41.10%	37.00%
L.America & Caribbean	21.00%	19.00%	20.60%	22.50%	22.90%	22.50%	20.30%	20.00%
Sub-Saharan Africa	15.00%	17.00%	16.10%	17.40%	21.20%	12.30%	12.00%	16.00%
Gross Domestic Investment Rate								
China	9.50%	10.50%	28.49%	30.32%	32.20%	38.97%	39.00%	42.00%
E.Asia & Pacific	12.90%	9.40%	22.60%	28.70%	30.40%	32.50%	40.10%	36.00%
L.America & Caribbean	20.40%	20.40%	21.30%	25.00%	24.30%	17.70%	18.20%	21.00%
Sub-Saharan Africa	17.30%	19.40%	21.30%	20.80%	20.40%	12.10%	15.30%	17.00%
Trade Dependence								
China	5.20%	8.10%	15.50%	19.97%	23.99%	27.37%	35.23%	45.35%
E.Asia & Pacific	21.70%	10.65%	30.95%	32.18%	33.45%	38.16%	44.60%	52.13%
L.America & Caribbean	14.65%	13.20%	13.00%	18.12%	25.25%	28.81%	27.07%	25.44%
Sub-Saharan Africa	24.60%	24.75%	23.35%	33.73%	48.73%	55.60%	49.56%	44.18%

Source: The World Bank, *World Development Indicators 1997*, *World Tables*, selected years, and author's compilations

Tables 1 and 2 provide comparative economic indicators for East Asian and other developing regions. Relatively high rates of annual growth in real GDP in East Asia are the result of various economic policies, as are comparative rates of inflation. As we have noted, one of the first keys to East Asia's economic success has been the fostering of high rates of saving and investment. On average they have exceeded not just the rates of other developing regions, but also those in Western Europe and North America. These rates have been achieved not just by keeping inflation rates relatively low, but also through the development of financial intermediaries, along with tax and interest incentives.

directed at Western Europe and North America, there is growing evidence of consistent movements in exchange, interest, and inflation rates among countries in the region.

Table 1 also illustrates the emphasis on export-led growth. Trade dependence among East Asian and Pacific countries is among the highest in the world. With few exceptions, economies that are more open to international trade generally have higher rates of growth in GDP, reflecting the gains that accrue from comparative advantage.³

Table 2
Economic Indicators for Selected Asian Countries

	China	Australia	Japan	Korea	Hong Kong	Indonesia	Malaysia	Singapore	Taiwan	Thailand
GDP (U.S.\$Bill.)	\$691	\$347	\$4,871	\$415	\$144	\$197	\$82	\$84	\$256	\$165
Population (mill.)	1,210	18	125.4	45.3	6.2	195.3	19.9	3	21.3	60.3
GDP per capita	\$571	\$19,294	\$38,844	\$9,159	\$23,161	\$1,007	\$4,131	\$27,900	\$12,005	\$2,730
PPP GNP, 1994	\$2,510	\$18,120	\$21,140	\$10,330	\$19,210	\$3,600	\$8,440	\$21,900	\$10,875	\$6,970
GDP Growth rate	10.00%	3.20%	0.90%	9.30%	4.60%	7.50%	9.60%	8.90%	6.10%	8.60%
Inflation Rate	10.00%	4.70%	-0.10%	4.70%	8.70%	8.90%	3.40%	1.70%	4.70%	5.80%
Unemployment Rate	3.20%	8.60%	3.40%	2.30%	3.50%	2.30%	2.80%	3.00%	1.80%	2.30%
Gross Domestic Saving Rate	44.00%	19.80%	30.70%	35.40%	32.60%	34.10%	33.90%	62.60%	25.90%	34.10%
Gross Domestic Investment Rate	42.00%	21.40%	28.30%	36.90%	29.00%	36.00%	42.80%	46.10%	24.20%	41.00%
Govt. Spending to GDP ratio	15.00%	27.40%	15.00%	12.10%	14.90%	8.10%	21.40%	13.40%	17.40%	16.10%
Govt. Surplus to GDP ratio	-2.10%	-0.40%	-1.60%	-0.30%	-0.20%	0.60%	3.70%	15.70%	-4.10%	2.80%
Monetary Growth Rate	23.70%	6.40%	3.20%	15.50%	14.50%	24.80%	13.20%	12.80%	10.10%	17.40%
GDP Composition:										
Agriculture	21.00%	3.00%	2.10%	7.00%	0.00%	17.00%	14.50%	0.20%	3.60%	10.30%
Industry & Mining	47.00%	27.10%	37.70%	43.00%	18.00%	41.00%	43.50%	39.20%	36.30%	40.30%
of which Manufacturing:	37.00%	14.10%	28.00%	29.00%	11.00%	24.00%	32.00%	29.70%	28.20%	30.20%
Services	32.00%	69.90%	60.20%	50.00%	82.00%	42.00%	42.00%	60.60%	60.10%	49.40%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Export Share of GDP	24.00%	19.00%	9.00%	36.00%	139.00%	25.00%	90.00%	177.00%	120.00%	39.00%
Export Concentration Index(1992):	0.076	0.196	0.140	0.109	0.152	0.194	0.156	0.183	0.123	0.090
Gini inequality index:	37.60%	22.50%	11.46%	41.20%	22.41%	31.70%	48.40%	24.69%	42.20%	46.20%

Source: The World Bank, *Asia-Pacific Profiles*, 1996. Data are for 1995.

Table 2 provides additional data on economic indicators for selected countries in East Asia. In addition to the emphasis on saving, investment, and export-led growth, these countries generally have emphasized policies to keep government taxation and spending rates relatively low, as well as efforts to restrain both inflationary and unemployment pressure. For the most part, East Asian governments have not only lower ratios of government spending to GDP than for most other regions, but also have either surpluses or modest deficit to GDP ratios. They thus have had relatively small levels of external public debt, small debt to GDP ratios, and small debt service ratios, as measured by debt service payments as a percentage of exports of goods and services. In short, by most measures, countries in East Asia appear to have adopted prudent economic policies consistent with the rates of economic growth they have been able to achieve.

³ Sub-Saharan Africa is one of the exceptions, though for reasons that can be explained more by the effects of adverse domestic policies than by the degree of participation in international trade. See, for example, Zelealem Yiheyis, "Output Growth and Inflation Adjustment of Devaluation Episodes in Sub-Saharan Africa", *Canadian Journal of Development Studies*, 18(1), 1997, pp. 93-117; Ishrat Husain, "Structural Adjustment and the Long-Term Development of Africa", in Rolph van der Hoeven and Fred van der Kraaij, editors, *Structural Adjustment and Beyond in Sub-Saharan Africa* (Portsmouth, N.H.: Heinemann, 1994), pp. 150-71; Ernest Aryeetey, et.al., "Financial Liberalisation and Financial Markets in Sub-Saharan Africa", *Journal of African Economies*, 6(1), March 1997, pp. 1-28; Angus Deaton and Ron Miller, "International Commodity Prices, Macroeconomic Performance and Politics in Sub-Saharan Africa", *Journal of African Economies* 5(3), Supplement Part 1, October 1996, pp. 99-191; and Phillip LeBel, editor, *Privatization Strategies in Africa* (Montclair, N.J.: Center for Economic Research on Africa, 1992). Economic reform policies in Sub-Saharan Africa with structural adjustment funding support from the World Bank now emphasize export-led growth and the promotion of private market incentives, much as has been the experience in East Asia.

If there is an exception to the positive side of East Asia's economic policies, it has been most focused on policies involving the transfer of technology.⁴ Most countries in East Asia have only recently moved to encourage international direct and portfolio investment while at the same time seeking ways to accelerate the transfer of technology. Since international investment usually serves as the vehicle for technology transfer, limiting external flows often has been seen as an Asian version of mercantilism.

The question of economic mercantilism has become most concentrated in trade negotiations regarding property right conventions, especially intellectual property rights in information technology. For example, China's bid to achieve full-member status in the World Trade Organization has been subject to ongoing review in terms of the willingness to support international property rights conventions, and has historical roots in U.S.-Japan trade negotiations.

The technology policy issue is straightforward. Where chronic trade imbalances exist even in the face of periodic currency re-alignments, negotiations on creating mutually acceptable rules on upholding property rights conventions will be necessary if trade-based economic growth is to continue. Because progress in these negotiations has continued to evolve, even this distinctive feature of East Asian economic policy is not perceived as a critical factor in the financial crisis that began in 1997.

Benchmarks of the East Asian Financial Crisis

How significant is East Asia's financial crisis? The short answer is simple enough: serious enough to stall regional growth, serious enough to increase the risk of regional political instability, and serious enough to consider major reforms in East Asian economic institutions. The role of the IMF in providing funding assistance to South Korea and Indonesia also provides a tangible symbol of the magnitude of East Asia's financial crisis, even though its restructuring initiatives may not be able to address the underlying fundamentals that gave rise to the events of 1997.⁵

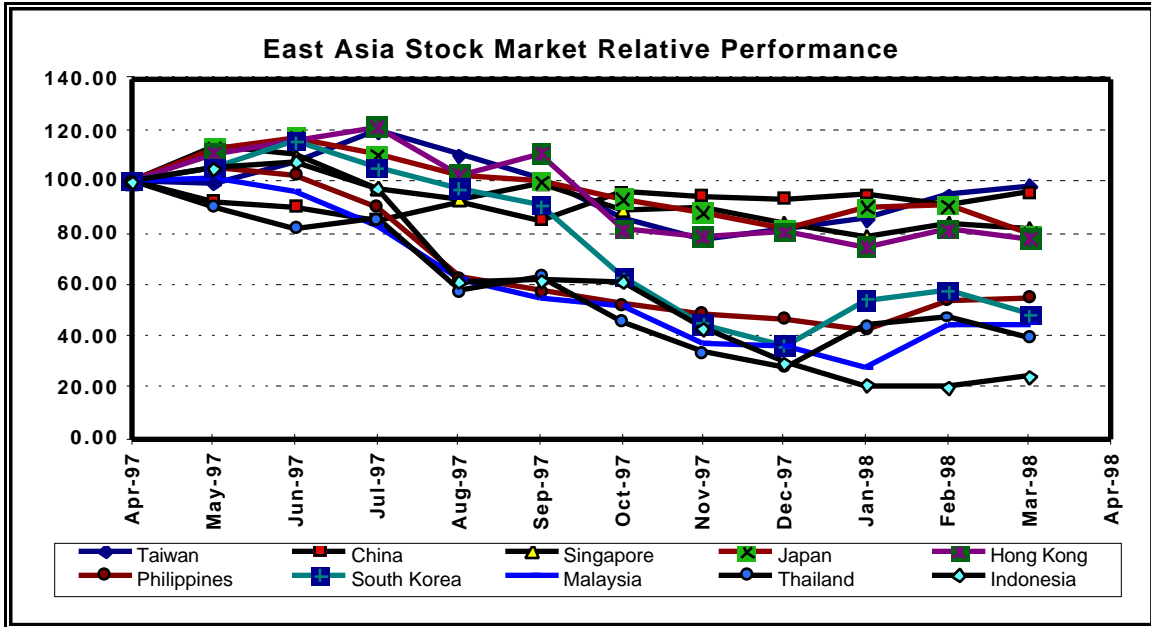
What measures do we have of the magnitude of East Asia's financial crisis? Capital and foreign exchange markets provide two immediate benchmarks. Sharp and significant declines have taken place in both markets, which in turn have led to rising rates of inflation and unemployment, declines in rates of economic growth, and growing social and political tensions.

Figures 3 and 4 illustrate the change in East Asian capital and foreign exchange markets between April 1997 and March 1998. Beginning in the summer of 1997, equity market indexes began to decline by as much as 80 percent from their April 1997 levels. Relative changes from April 1997 to April 1998 were as follows: Taiwan (-1.95%); China (-4.48%); Singapore (-18.10%); Japan (-20.42%); Hong Kong (-22.17%); Philippines (-22.17%); South Korea (-52%); Malaysia (-55.17%); Thailand (-60%); and Indonesia (-75.68%). For all of these countries, the GDP weighted relative decline in East Asian equity indices over the same period was 23.67 percent, largely because of the importance of Japan's GDP in the region.

Figure 3

⁴ Paul Krugman, "The Myth of Asia's Miracle", *Foreign Affairs* 73(6) (November-December 1994), pp. 2-78; and "Competitiveness: A Dangerous Obsession", *Foreign Affairs* 73(2) (March-April, 1994), pp. 28-44.

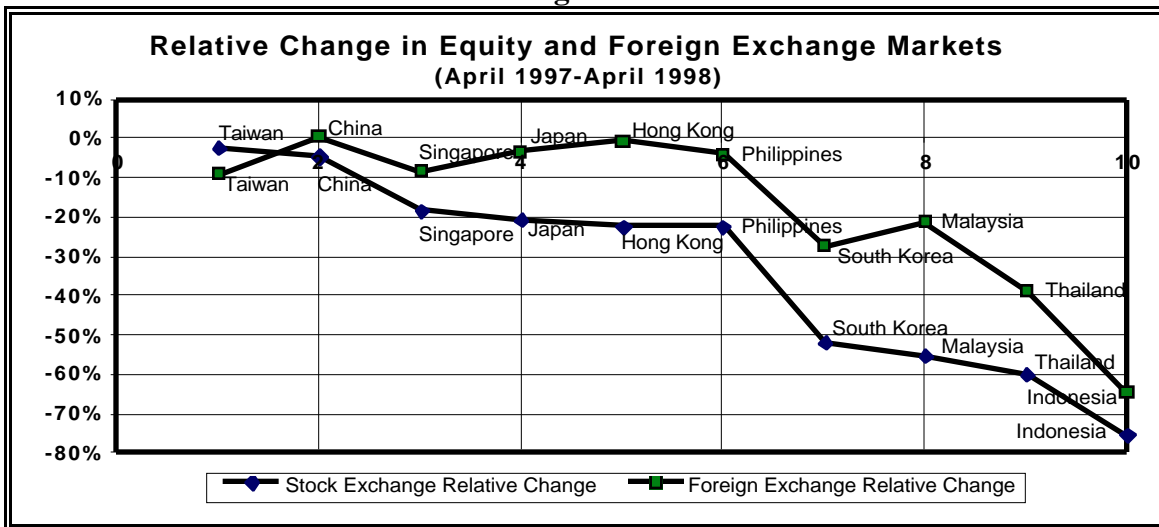
⁵ Martin Feldstein, "Asian Fallout: The IMF's Errors", *Foreign Affairs* 77(2) (March-April 1998), pp. 20-31.



Source: Datastream International., and author's compilations.

As a relative comparison, the worst annual changes in the U.S. Dow Jones index were in 1931 (-52.67%), 1907 (-37.73%), and 1930 (-33.77%), with comparable rates taking place in Western European markets during similar periods. Thus, even taking into account the somewhat lower relative importance of equity markets in East Asian economies, there are few parallels to the relative declines in South Korea, Malaysia, Thailand, and Indonesia, and it is in these countries that the sharpest reverses in economic performance have since unfolded.

Figure 4



Source: Datastream International., and author's compilations.

As declines in East Asian capital markets have taken place, so too have there been declines in foreign exchange markets. Figure 4 illustrates the relative change in foreign exchange and equity markets during the past year. There is a positive correlation (.893) between relative changes in equity and foreign exchange markets, largely because of the emphasis that East Asian countries have placed on export-led growth. As can be seen in

Table 3, there also is a positive correlation among regional currencies, based on the degree of regional trade interdependence that has developed.

Table 3
East Asia Currency Correlations, 1993-1997

	Philippines	Taiwan	Thailand	Japan	Malaysia	Singapore	China	Indonesia	Korea
Philippines	1.00								
Taiwan	0.19	1.00							
Thailand	0.70	0.37	1.00						
Japan	0.03	0.46	0.28	1.00					
Malaysia	0.58	0.06	0.45	0.15	1.00				
Singapore	0.47	0.43	0.63	0.58	0.59	1.00			
China	0.00	0.01	-0.03	-0.13	0.13	-0.07	1.00		
Indonesia	0.75	0.14	0.60	0.08	0.84	0.56	-0.02	1.00	
Korea	0.14	0.27	0.11	0.53	0.24	0.57	-0.03	0.20	1.00

Source: Ibbotson Associates, Chicago, as reported in Brown, Goetzmann, and Park (1998). The mean currency correlation is .302

It is logical to ask whether the East Asian Financial crisis was magnified by the degree of regional stock market and currency correlation. While there have been some suggestions that these correlations may have played a role, the evidence thus far is not compelling.⁶ Because relative changes in East Asian financial and currency markets have not been uniform in space or time, ultimately the roots of East Asia's financial crisis depend much more on the degree of efficiency, or lack of it, in local market institutions. To see why this is so, we need to look at how standard models of international financial adjustment work and what limitations they present in the context of East Asia's recent experience.

East Asia Inflation Rate Correlations, 1989-1997

	Hong Kong	Singapore	Korea	Taiwan	Thailand	Malaysia	Philippines	Indonesia	China	Japan
Hong Kong	1.00									
Singapore	0.60	1.00								
Korea	0.74	0.83	1.00							
Taiwan	0.72	0.20	0.45	1.00						
Thailand	-0.40	0.00	-0.01	-0.58	1.00					
Malaysia	0.45	0.14	0.38	0.49	-0.57	1.00				
Philippines	0.77	0.71	0.94	0.39	0.07	0.32	1.00			
Indonesia	-0.29	0.03	-0.18	-0.64	0.17	0.00	-0.11	1.00		
China	0.12	-0.13	-0.33	0.42	-0.42	-0.09	-0.32	-0.21	1.00	
Japan	0.77	0.63	0.77	0.45	-0.14	0.08	0.77	-0.50	-0.24	1.00

Source: World Bank, Netsource Asia, and author's compilations. The mean inflation correlation is .161.

⁶ Although East Asian stock and currency markets began to collapse within a similar time period, thus far the evidence that these events were mutually reinforcing is not strong. OLS regressions on the relative decline in stock and foreign exchange indices as a function of mean regional currency correlations and individual country trade dependency were not significant. This finding is consistent with tests undertaken by Brown, Goetzmann and Park on the extent to which Hedge Funds contributed to the Asian currency crisis. Brown et.al. developed estimates of changing positions of the largest ten currency funds in the Malaysian ringgit and to a basket of Asian currencies. They find net long or short positions in the ringgit or its correlates fluctuated dramatically over the previous four years, but that these fluctuations were not associated with moves in the exchange rate. Estimated net positions of the major funds were not unusual during the crash period, nor were profits of the funds during the crisis. See, Stephen J. Brown, William N. Goetzmann and James Park, "Hedge Funds and the Asian Currency Crisis of 1997", NBER Working Paper No. 6427, February 1998. This evidence stands in contrast to the position put forth by Malaysian Prime Minister, Mohamad Mahathir Mohamad, in "Highwaymen of the Global Economy", *The Wall Street Journal*, September 23, 1997, in which he suggested that the currency crisis was due to foreign exchange speculation by hedge fund managers such as George Soros.

Standard Models of International Financial Adjustment

In a world of perfect information, there are clear warning signs that a country's economic policies are unsustainable, and market forces can lead to self-correcting outcomes. Even under a fixed exchange rate system, for example, there still can be sufficient market signals to generate adjustments along a sustainable growth path.

Traditional explanations of East Asia's financial crisis have been built around currency adjustment models.⁷ Usually, these models have been developed to explain a country's monetary and fiscal policies in an inflationary environment that produces adjustment pressure on the economy's foreign exchange rate. When a country's relative inflation rate is positive and increasing, equity markets adjust down in proportion to inflation rate differentials, as does a country's foreign exchange rate. Moreover, they tend to do so roughly in proportion to a country's inflation rate differentials. If in the face of inflationary pressure, a country seeks to maintain a pegged exchange rate, its ability to do so is dictated by its foreign exchange reserves.

In a traditional model, as long as a country's current account balance is positive, a country can maintain some relative fixity in its foreign exchange rate through its accumulation of net foreign exchange reserves. Ultimately, however, inflationary cycles tend to undermine a country's relative competitive position, and the current account balance declines, thus leading to pressures to lower domestic spending through a slowdown in monetary expansion and a corresponding increase in the real rate of interest.

The scenario described above reflects many of the elements in the European exchange rate mechanism crisis of 1992, the debt crisis in Sub-Saharan Africa in the mid-1980's, and the Latin American debt crisis of the early 1980's, and more recently, the Mexican crisis of 1994.⁸ What those regions shared in common were policies built around unsustainable commitments to relatively fixed exchange rates, among others. When foreign exchange rates eventually were adjusted, as with the IMF's funding program in Mexico, and with the devaluation of the CFA franc in Central and West Africa, these economies gradually regained fiscal and financial equilibrium.⁹

⁷ See, Paul Krugman, "A Model of Balance of Payments Crises", *Journal of Money, Credit, and Banking* 11 (1979), pp. 311-325; R. Flood and P. Garber, "Collapsing Exchange Rate Regimes: Some Linear Examples", *Journal of International Economics* 17 (1984), pp. 1-13; and more recently, Maurice Obstfeld, "The Logic of Currency Crises", *Cahiers Economiques et Monétaires*, 43 (1994), pp. 189-213. Krugman draws a distinction between "first" and "second generation" models, with the former characterized by efforts to maintain fixed exchange rates against limited foreign exchange reserves, and the latter in which which policymakers make a trade-off between short-run macroeconomic flexibility and long-term credibility.

⁸ See Roland Vaubel, "The Breakdown of the ERM and the Future of the EMU", in David Cobham, editor, *European Monetary Upheavals*. (Manchester: Manchester University Press, 1994); Michele Fratianni and Michael J. Artis, "The Lira and the Pound in the 1992 Currency Crisis: Fundamentals or Speculation?", *Open Economies Review* 7((0) Supplement 1 (1996), pp. 573-89; Sebastian Edwards, *Crisis and Reform in Latin America* (New York: Oxford University Press for the World Bank, 1995); Sridhar Sundaram and Indudeep Chhachhi, "Valuation Effects of the Mexican Debt Crisis", *Applied Financial Economics* 7(1), (February 1997), pp. 97-106;

⁹ Africa's debt crises have been affected to some extent by the prolonged commitment to a CFA fixed exchange rate, and which was changed only in 1994. Useful sources include: Ishrat Husain and Ishac Diwan, *Dealing with the Debt Crisis*, a World Bank Symposium (Washington, D.C.: The World Bank, 1989); E. Wayne Nafziger, *The Debt Crisis in Africa* (Baltimore: Johns Hopkins University Press, 1993); See, for example, Phillip LeBel, editor, *New Initiatives for Africa's Debt* (Montclair, N.J.: Center for Economic Research on Africa, 1989).

There are two basic difficulties with the traditional model. First, most countries in East Asia were not confronting excessive inflationary pressures at the time of the financial crisis of 1997. Second, they also had either positive current account balances or relative small negative ones so that expected pressure on foreign exchange did not pose a problem. Third, because government policies also were not producing large public sector deficits, inflation rates were relatively low. In short, nothing that would compare to previous experience elsewhere seemed to be at work in East Asia.

When a country faces a shortfall in confidence, equity markets turn downward as does the foreign exchange rate. Usually, these signals provide self-correcting indications in financial markets that translate into accompanying changes in a country's underlying economic and fiscal policies. When markets are well informed, financial signals provide an efficient mechanism for these changes to unfold and in ways in which one would not qualify as crisis, which is an unforeseen set of events.

Under ordinary circumstances, even a financial crisis eventually will be resolved by adjustments in a country's fiscal and monetary policies. In fact, nothing in the framework of financial crises suggests an extraordinary role for external intervention as long as a country's economic reforms generate the necessary credibility among economic agents to restore financial flows to a sustainable level. Yet, apart from Japan's continuing economic stagnation, what we have seen in the case of South Korea and Indonesia is an expanded role of the IMF, drawing on its experience in the Mexican and Latin American crises of the early 1980's. We thus need to examine what steps the IMF has undertaken and whether these measures are appropriate to resolving the current financial crisis in East Asia.

The IMF in East Asia's Financial Crisis

Let us fold into this traditional framework the role of the IMF. Traditionally, the IMF has functioned as a lender of last resort when a country can no longer sustain its foreign exchange rate and its net foreign obligations. What the IMF represents is not just a source of funding, but also a symbol of restoring an economy's financial credibility to a point where it can service present and future levels of external debt. One thus can think of the success of the IMF in terms of the extent to which a country can move from junk to investment grade bond ratings. Yet how it does so is a point of considerable controversy, as its role in various structural reform programs has shown.

The standard recipe for reform put forth by the IMF is straightforward. First, devalue the currency to stimulate export growth at rates sufficient to amortize the cost of public loans and loan guarantees put forth by the IMF and other international lenders. Second, raise taxes to generate sufficient foreign exchange reserves to service the increase in foreign debt accompanying new flows of external credit. Third, couple these steps with measures to reduce further the role of government in the economy, notably through reductions in subsidies and historically targeted contractual relationships. Fourth, increase the degree of foreign participation in domestic capital markets to improve performance at globally competitive rates. What all of these measures add up to is economic liberalization with increased transparency in financial and economic transactions. As the IMF emphasizes, transparency is a necessary condition for restoring investor confidence to levels essential for sustainable economic growth.

As recipient countries adopt IMF reforms, there is an inevitable short-term increase in domestic inflation coupled with a slowdown in economic activity, from which an economy gains essential expansion in its exports to be able to amortize the cost of external funds provided. Depending on how the mix of an IMF program is implemented, it may or may not absolve those most directly linked to a financial crisis in the first place, be they domestic creditor institutions, or external financial institutions.

To the extent that fundamental reforms in the efficiency of financial institutions do not take place with an IMF funding program, the IMF basically may serve as a financial relief mechanism to a country's most pressing creditors. More to the point, the IMF's programs for South Korea and Indonesia have been criticized for intervening too much when the rest of the economic fundamentals in these countries are perceived to be sound.¹⁰ This has been most focused in terms of the IMF role in pressing for the suspension in operations of 9 of 30 banks in South Korea, and its insistence that Indonesia not adopt a proposed currency board which would fix the rupiah at an exchange rate of 5,000 to the U.S. dollar when the market rate operates close to 10,000 to the U.S. dollar.¹¹ The point here is not to evaluate the merits of a currency board proposal, but rather the extent to which the kinds of reforms put forth by a funding agency such as the IMF resolve the underlying determinants of financial instability.

The Microeconomic Foundations of East Asia's Financial Crisis

Most discussions regarding proposals to East Asia's financial crisis revolve around the role of national economic reforms and the role of the IMF. Discussion on policy options often are misleading in that the focus has been on macroeconomic considerations rather than on the underlying micro-foundations in the most affected countries.

The microeconomic basis of East Asia's financial crisis can be traced to the presence of imperfect information, and in particular, the incentives that give rise to moral hazard in financial markets. The particular engine in the South Korean and Indonesian cases has been the presence of speculative bubbles in bank lending. These bubbles produced skewed asset valuations in the financial sector. When these bubbles eventually collapsed, they produced a liquidity crisis which the financial system was not able to manage. Financial illiquidity produced a curtailment in the flow of loans, which in turn reduced the ability of firms, especially those involved in international exports, to sustain the flows of goods and services. As financial illiquidity became apparent, credibility in the country's equity and currency markets dropped sharply, thus leading to an increase in the domestic rate of inflation, an increase in unemployment, and a slowdown in economic growth. We develop this framework in terms of a model of optimal transparency with incomplete contracts, and what this model implies for the path of East Asian financial reforms.

In the abstract, perfectly competitive markets generate efficient outcomes consistent with marginal cost pricing. Deviations arise in the presence of imperfect competition, externalities, and government rules. However, one of the most important determinants is the level and distribution of information. If information were costless, then agents would produce efficient outcomes consistent with marginal cost pricing. Yet even if we allow for positive information costs, the critical factor is the distribution of information among all agents. As is well known, an asymmetric distribution of information tends to create inefficient outcomes, in particular, the likelihood of adverse selection, moral hazard, or both.

¹⁰ Jeffrey Sachs, "The IMF is a Power Unto Itself", *The Financial Times*, December 11, 1997.

¹¹ "Indonesia Examines Fixing Rupiah to the Dollar", *The Wall Street Journal*, February 4, 1998, p. A17; "IMF is Caught in a Quandary Over Indonesia", *The Wall Street Journal*, March 4, 1998, p. A15. Indonesia's proposal for a currency board was based on the Hong Kong and Singapore currency board models, and was put forth by Stephen Hanke, of Johns Hopkins University. The Wall Street Journal embraced the idea of a currency board, perhaps as much because of its long-standing opposition to the IMF as much as to any merits in the proposal: "Indonesia by the Board", *The Wall Street Journal*, February 11, 1998, p. A22.

Markets usually address informational assymetry in terms of the relevant costs and benefits in the contracting process. Since the marginal cost of perfect information tends toward infinity, all markets tend to adopt proxy measures for the level and distribution of information, and the resulting prices. However, if financial markets are sufficiently broad, they provide suitable pricing options that can diversify a prevailing degree of risk. The greater is the range of contingent market valuation alternatives, the lower will be the probability of a particular financial crisis. It is the absence of sufficiently rich pricing options in East Asian financial markets that led to the crisis that began in 1997.

Markets with Incomplete Contracts

Let us now consider East Asia's financial crisis as an agency problem for banks and firms. Agents and principals each can be thought to be utility maximizing with some degree of risk aversion. If we express these preferences in terms of an Arrow-Pratt constant relative risk-aversion expected utility function, we have:

(1) $EU(X,Y)$, where

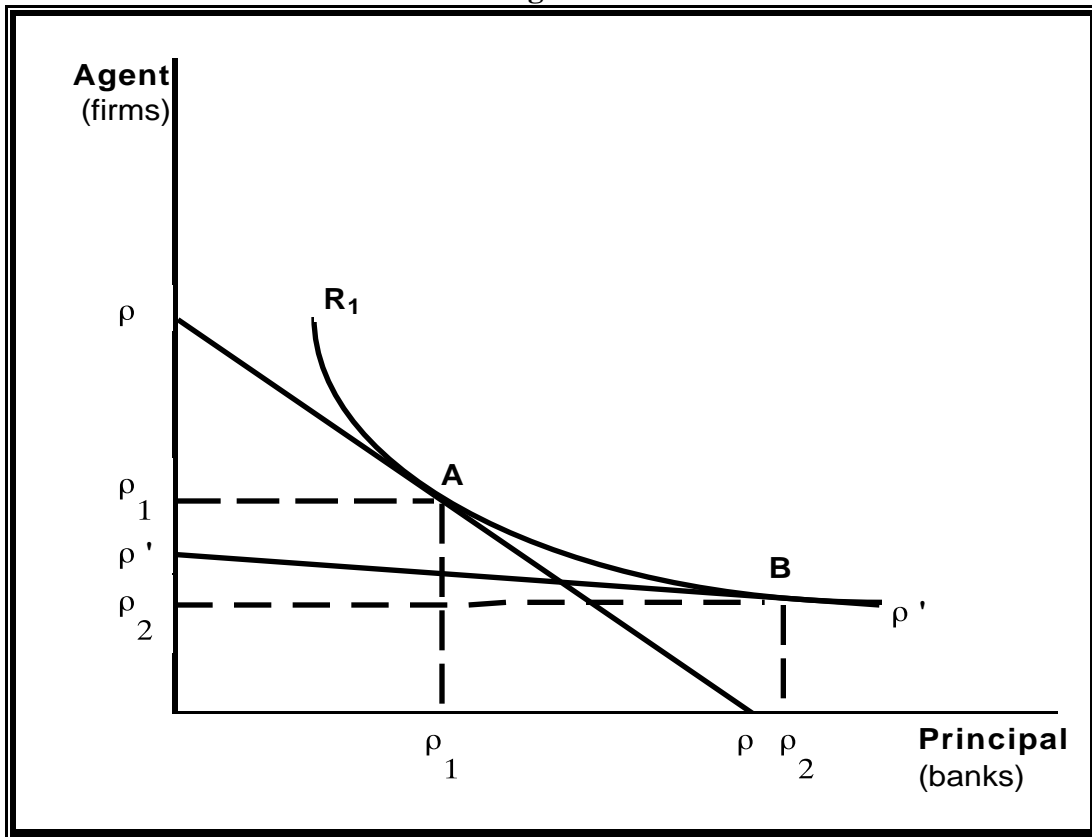
X represents a random variable for which the agent must make a choice for the control variable Y before Y is observed. For an infinite time horizon, the first and second order conditions for maximization are:

$$(2) \quad EU_Y(X, Y^*) - U_Y(x, Y^*) dF(x) = 0,$$

$$(3) \quad EU_{YY}(X, Y^*) - U_{YY}(x, Y^*) dF(x) < 0$$

Let us now place the expected utility framework in terms of a principal-agent investment framework. Figure 5 illustrates the risk-return relationship for a principal-agent decision. In a static environment, investment alternatives are rank ordered according to two criteria: the expected rate of return and the underlying degree of risk. R_1 represents the set of investment alternatives at time t that yield the same expected rate of return. Its convexity is a positive function of the degree of relative risk among all investment alternatives.

Figure 5



The opportunity cost of capital defines a constraint, ρ , which embodies the prevailing degree of institutional risk. In a world of symmetric information, the slope of the risk constraint will be 45 degrees, and the optimal investment mix will be that which maximizes the expected rate of return for the prevailing degree of institutional risk, shown here at point A, with iso-risk levels of ρ_1 and ρ_1 , respectively, for both principal and agent.

Along ρ , any other combination will involve not only an asymmetric distribution of risk but also a lower expected rate of return.

When contracting is implicit, as in the provision of continuing credit to borrowers, principals and agents may share differing degrees of risk, based on the level of guarantees that may be put in place. An agent who perceives that losses will be covered in the event of default, thus perceives the prevailing degree of risk to be along the ρ' line rather than along ρ . In this case, with a lower degree of risk, an agent will be indifferent between choices A and B, and will be willing to adopt B since losses are covered by guarantees.

Under a regime of implicit contracting, the principal, however, does not perceive B to be riskier than A since both A and B carry the same expected rate of return. For the unwitting principal, ρ_2 represents a relatively higher level of risk, while for the agent, it is relatively lower under the implicit set of guarantees. In effect, the agent is adopting a level of moral hazard that would not be sustainable in the presence of transparent accounting practices.

Although Figure 5 represents one level of moral hazard, we add that there can be several layers operating at once. For example, while firms may adopt morally hazardous behavior, financial guarantees are what makes it possible for banks to adopt an asymmetric level of risk. Why would banks do so? The answer is that they in turn adopt morally hazardous behavior because government makes an implicit guarantee to them for the loans that they make. In turn, when foreign capital inflows expand into the financial system, local financial institutions, and by extension, local governments, often extend implicit guarantees on the repatriation of capital such that the chain of moral hazard is extended further. The temporal and spatial extension of moral hazard in one market will continue across markets up to the point where transparency becomes sufficient where conditions can no longer be sustained.

To return to our primary example in figure 5, banks make lending choices partly on the value of collateralized assets. Collateral serves as the principal means of getting agency compliance, since they serve as insurance in the event of default. Two considerations affect the extent to which any such lending pattern will be efficient. First, the higher the collateral requirements, the lower will be the level of lending, since borrowers will not commit collateral more than the equivalent underlying degree of risk that they confront. In terms of Figure 5, this means that borrowing with collateral requirements serves to return agency borrowing to levels consistent with the base level position A, but not completely as long as the marginal cost of collateral exceeds the expected rate of return and as long as the principal provides implicit loan guarantees.

The second consideration is the extent to which collateral assets are traded in efficient markets. If the range of assets is limited by institutional considerations, then banks may develop excess reliance on a limited number of assets such as real estate. Real estate values thus become subject to a speculative bubble, which in turn artificially expands a principal's excess reserve ratio. When real estate values are increased further with periodic international capital inflows, banks principals expand their lending accordingly. Eventually, the speculative bubble in real estate collapses, thus creating a liquidity crisis in banking, which eventually generates a credit shortfall, thus leading to a rise in insolvency among banks and agency firms.

What makes possible the magnitude of a crisis is that implicit guarantees do not provide any market signals until the level of risk has reached the limits of default. Transparent accounting rules and the provision of contingent pricing of assets would have provided earlier warning signals of an imbalance in the degree and distribution of risk bearing between agent and principal, and adjustments in portfolios would have occurred much earlier in the process.

Although hindsight is always perfect, let us extend the principal-agent framework to incorporate the impact of asset bubbles that eventually lead to collapse. We do so in terms of a simple model of asset bubbles.¹² Given some positive level of risk tolerance by an agent, with future utility discounted at a constant rate, r , assets would have a constant expected real return in equilibrium. The price of asset share, q_t , which is the opportunity cost of the asset, equals the expected discounted present value of the return accruing to ownership of the asset during the ownership period, d_{t+1} , plus the price at which the share can be sold at the end of the ownership period, q_{t+1} . The benefits of asset ownership thus are defined as:

¹² Much of this formulation is adapted from Robert P. Flood and Robert J. Hodrick, "On Testing for Speculative Bubbles," *Journal of Economic Perspectives* 4(2), Spring 1990, pp. 85-101.

$$(4) \quad q_t = E_t(d_{t+1} + q_{t+1})/(1 + r),$$

where: $E_t(d_{t+1} + q_{t+1})$ represents the expected value of the future gain and the future price conditional on information available to people at time t.

From equation (4), one can derive the optimal pricing formula by a recursive process. To do so, update equation (4) by one time period and substitute the resulting expression for q_{t+1} into the original equation. This yields:

$$(5) \quad q_t = E_t[d_{t+1} + E_{t+1}(d_{t+2} + q_{t+2})/(1 + r)]/(1 + r).$$

From this substitution, one can update equation (4) again, and substitute for q_{t+2} in equation (5). From this process, one derives an expression for future expectations, $E_t(E_{t+1}(d_{t+2})) = E_t(d_{t+2})$, which states that the expected value today of what one expects in the future when more information becomes available. Equivalently, this expression states that what we expect about the future today minus the information available tomorrow.

If one extends the substitution process to infinity, the current price then equals the expected present value of all future returns:

$$(6) \quad q_t^f = \sum_{i=1}^{\infty} [1/(1 + r)^i] E_t(d_{t+i})$$

Equation (6) defines the market fundamentals price in that over an infinite time horizon, the discounted value of the price is zero. This expression also determines the basis of defining a speculative bubble.

If one assumes that expectations are rational, a speculative bubble represents a value of an asset that deviates above the underlying market fundamental price.¹³ The bubble, B_t , can be factored into equation (6) as:

$$(7) \quad q_t = q_t^f + B_t .$$

If the market price in equation (7) is to satisfy the condition in equation (4), then the current value of the bubble must equal the expected discounted value of the future bubble in the next time period:

$$(8) \quad B_t = E_t(B_{t+1})/(1 + r)$$

Equation (8) states that a bubble can be possible as long as the bubble represents an expectation that the bubble will continue. If we restate equation (8) for time t+1 we have:

$$(9) \quad B_{t+1} = B_t(1 + r) + b_{t+1}, \text{ where: } b_{t+1} = B_{t+1} - E_t(B_{t+1})$$

If bubbles exist, equation (9) implies that they will grow at the real rate of interest.

¹³ Behzad Diba and Herschel Grossman, "On the Inception of Rational Bubbles," *Quarterly Journal of Economics*, 102, August 1987, 697-700, note that rational expectations rules out negative bubble values. Note that estimation of the fundamental price becomes critical in direct proportion to the length of the underlying time horizon.

William Brock (1982) made the common sense observation that since economic agents do not adopt infinite time horizons for investment decisions, then rational bubbles can not exist.¹⁴ As a counterfactual proposition, if a representative agent were to adopt an infinite time horizon, buying the asset and holding it forever would generate a marginal gain at time t equal to the expected discounted value of all future returns, which is the market fundamentals price. If the actual price were less than the fundamentals price, a representative agent could increase utility by buying the asset and planning to hold it forever. This increased in demand would increase the market price, thus eliminating the bubble. In contrast, if the price of the asset exceeded the market fundamental price, an agent should sell the asset because the utility gain would exceed the utility lost from expecting to hold it forever. This decrease in demand would cause the market price to fall.

Tests for bubbles have been done for various assets, notably, money (Flood and Garber, 1980), and equities (Shiller, 1981, Grossman and Shiller, 1981, Romer and Shapiro, 1985, West, 1987).¹⁵ Following Flood and Garber, we can state an asset bubble test as:

$$(10) \quad m_t - p_t = \beta - \alpha [E_t(p_{t+1}) - p_t] + v_t,$$

where the left hand side represents the logarithm of the value of the real asset in which m_t is the nominal value and p_t is the price level at time t . The right-hand side states that the demand for real assets deviates from a constant level when there is expected inflation, which decreases the nominal demand for the asset when other determinants in the random error term change. The parameter α measures the sensitivity of the demand for the asset with respect to expectations of inflation.

To obtain a market fundamentals solution one solves equation (10) for p_t . In turn, one can define the increase in asset value at time t as $k_t = (m_t - \beta - v_t)/(1 + \alpha)$. The present worth factor can be defined from equation (7) as $\alpha/(1 + \alpha)$. The fundamental solution to equation (10) thus becomes:

$$(11) \quad p_t^f = \sum_{i=0}^{\infty} [\alpha/(1 + \alpha)]^i E_t(k_{t+1})$$

The price level at any given time is determined by discounted expected values of factors affecting the supply of the asset relative to the demand. Following Flood and Garber (1980), we can restate a test for rational bubbles as:

$$(12) \quad p_t - p_{t-1} = \delta_0 + \delta_1 \mu_{t-1} + \dots + \delta_k \mu_{t-k} + \beta_0 [1 + (1/\alpha)]^t + \varepsilon_t,$$

where μ_t is the asset growth rate and $\mu_t = \ln m_t - \ln m_{t-1}$.

¹⁴ William Brock, "Money and Growth: The Cae of Long-run Perfect Foresight," *International Economic Review*, October 1974, 15, 750-777.

¹⁵ Robert Shiller, "Do Stock Prices Move By Too Much to be Justified by Subsequent Changes in Dividends?" *American Economic Review*, 71, June 1981, pp. 421-36; Sanford Grossman and Robert Shiller, "The Determinants of the Variability of Stock Market Prices," *American Economic Review*, 71, May 1981, pp. 222-27; Kenneth West, "A Specification Test for Speculative Bubbles," *Quarterly Journal of Economics*, 101, August 1987, pp. 553-580.

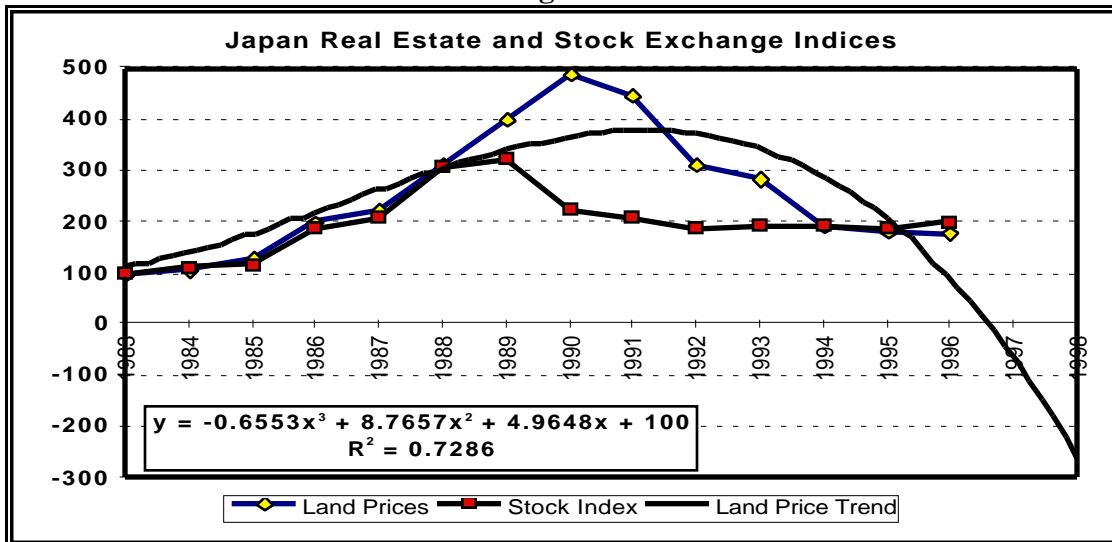
The problem with most models of asset bubbles is that they do not provide a clear basis of why bubbles exist. As Flood and Hodrick also noted, most models are based on deterministic processes, and they do not satisfy the conditions for an asymptotic distribution characteristic of classical econometric tests. This latter problem is found in the fact that regressor values become explosive. An exploding regressor means that any time series sample is always a small sample, and thus do not satisfy the standard central limit theorems. Such models thus represent first approximations of bubble tests. What is missing is an institutional constraint in the form of asset choices, and which becomes central to understanding East Asia's financial crisis.

Let us now consider a principal-agent model of the financial system. This system can operate either with implicit or explicit guarantees in the form of reserve funding to satisfy creditors in the event of a liquidity crunch. To the extent that these guarantees are implicit rather than explicit means that there is not a periodic market valuation of asset values that drive lending patterns in the financial system, and which seems to have been widespread in a number of East Asian economies. When agents borrow funds with implicit guarantees, they adopt a higher level of risk than they would in the absence of such implicit guarantees. To this picture, we now add the question of asset diversification.

In many East Asian economies, because equity markets have emerged relatively recently, asset lending collateral has been biased in favor of real estate. Banks would lend money on the basis of perceived values of real estate, and, it appears, somewhat independent of underlying trends. In turn real estate values were driven by a speculative bubble process that exaggerated the lending capacity of the banking system. As credit became more readily available, borrowing agents undertook investments with higher relative risk, and banks were willing to make these loans on the basis of implicit guarantees of repayment by governments in the event of defaults. What helped to produce the crisis was the very economic liberalization that these countries undertook in support of export-driven growth. When equity markets provided an alternative investment asset to real estate, real estate values adjusted to an underlying fundamental price level, which in turn precipitated a credit shortfall in the banking system. As banks adjusted their reserve ratios to the lower value of real estate assets, firms that had undertaken riskier investments found that they no longer had access to credit at previous rates.

One might ask why a real estate bubble did not show up in East Asian inflation rates at a level that would have warranted earlier intervention by central banks. The answer is that if asset choices were relatively limited to real estate, then this represents but one component in the overall price index, even though it may be a crucial one to the determination of banking lending practices. To the extent that there is an inverse relationship between the choice of collateral assets in lending and components in an overall price index, then there is no obvious linkage between the underlying degree of risk and the prevailing rate of inflation.

Figure 6

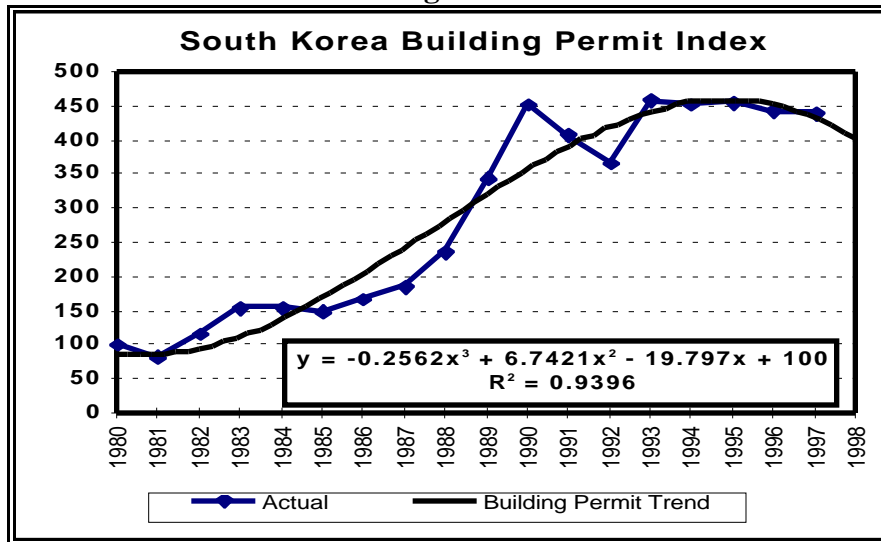


Source: *Japan 1998: An International Comparison*. (Tokyo: Keizai Koho Center, Japan Institute for Social and Economic Affairs, 1998), p. 14, with author's trend estimation.

To test for the causes of East Asia's financial crisis, we need evidence on the pattern of real estate values that preceded the collapse of equity and foreign exchange prices. Data are available for Japan, and are illustrated in Figure 6. When linked to the Nikkei Stock Exchange index, Japan's experience points to a relative rise in real estate land values that continued to rise even when stock values began to decline, but then began a downward trend that has led to rising insolvency in Japanese financial institutions.

For South Korea, we do not have a direct measure of composite real estate prices. We show in Figure 7 a proxy measure of real estate trends, based on an index of building permits reported by the Central Bank of Korea. The slowdown in building permits provides an indication that real estate values had peaked and that a downtrend was underway. As this downturn took place, financial institutions had lower collateral values against which to proceed with new lending flows, and a credit shortfall also began to unfold, placing a number of manufacturing firms with reductions in working capital, and which translated into the decline in stock market values and a fall in the Won foreign exchange rate.

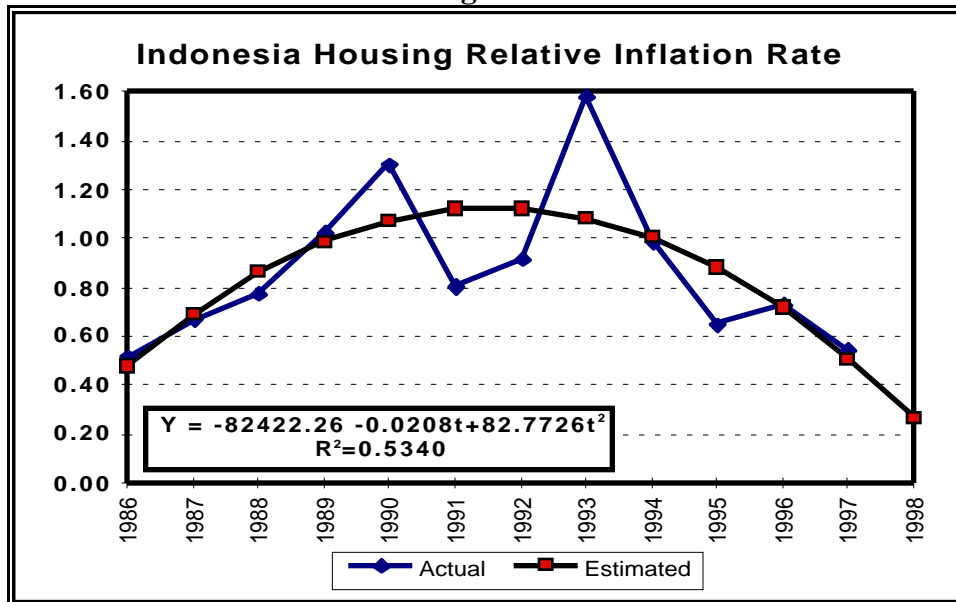
Figure 7



Source: Central Bank of Korea, *Economic Indicators*.

Data for Indonesian real estate composite prices also have not been readily available. We report here a proxy measure, using the price of housing relative to the composite inflation rate of 27 provincial capital cities. While this measure does not show a real estate price bubble and collapse, it does indicate that the relative price of housing began to decline several years before the financial crisis of 1997, and this may have contributed to the relative decline in real estate collateral leading to Indonesia's financial crisis.

Figure 8



Source: Government of Indonesia, Economic Statistics Bureau.

Indian Economic Reforms In Perspective

Unlike most of the East Asian countries we have examined, India, like China, seems to have avoided a sharp downturn in its financial and foreign exchange markets. There are four key reasons why this has been so. First, India has thus far relied less on export driven growth than have the East Asian tiger economies. Second, India has pursued domestic

monetary and fiscal policies with a lower growth trajectory than for the most affected countries in East Asia. Third, India has had a far smaller share of foreign investment than in some of the more affected East Asian economies. And Finally, India has a more transparent system of accounting practices in comparison to its East Asian neighbors, though not on a level with West European or North American standards. While none of these factors alone or in combination with others precludes the kind of asymmetric decision problem we have put forth to explain East Asia's crisis, as economic reforms in East Asia unfold, these factors do hold policy lessons for India as the process of economic liberalization moves forward.

Let us look briefly at each of the four factors that distinguish India's economic policies from those of its East Asian neighbors.

Optimal Transparency

If East Asia's financial crisis has been driven by agency problems, the question is what kinds of institutional reforms can be implemented to prevent a repeat of the events of 1997. The short answer is that greater transparency in institutional accounting will lead to market signals that enable agents to undertake corrective action before a crisis unfolds. Implementation of bank and firm accounting standards similar to those found elsewhere in the world is one example. In addition, while greater transparency in accounting may be a necessary step, another is to open financial markets to greater competition, and to allow the creation and operation of financial products to improve the efficiency of markets.

Opening financial markets means not just allowing greater foreign capital inflows, which has already been the case in many East Asian economies, but rather options for multinational ownership. To do so would represent a major change in ownership policies in many East Asian economies, and it may be a sufficient basis for improving market efficiency. However, what is necessary is that regardless of ownership, unless market signals can bring about a reduction in the presence of moral hazard, the prospects for a renewed financial crisis will still be in place.

One way to address the issue of moral hazard is in terms of optimal transparency. We can think of any increase in the level of information as improving the estimate of the underlying degree of risk in any investment decision. Increases in the level of information can be determined by the quantity of information that is generated at a given moment in time, and by the frequency with which it is disseminated for decisions by economic agents. Both measures involve transactions costs and since the marginal cost of perfect information approaches infinity, there will be a natural upper limit as to how much and how frequently information needs to be generated in order to reduce the level of moral hazard.

Policy Implications

Several policy implications derive from the framework presented here. First is that to the extent that markets continue to function on implicit guarantees, the absence of market testing will not provide the necessary periodic valuation that can enable economic agents to make rational choices. It is instructive to note that depositor insurance may actually increase rather than reduce the problem of moral hazard.¹⁶ A prudent approach would be to adopt a sliding scale of depositor insurance, with higher levels of deposits more subject to the underlying level of market risk.

Second, one way to avoid speculative bubbles and the problem of moral hazard is to increase the range of asset choices to the financial system. This means the adoption of

¹⁶ Deposit insurance coverage levels were an important factor in the savings and loan institution financial crisis in the United States, where a similar problem of moral hazard arose.

mechanisms to strengthen rather than to reduce the efficiency of East Asia's equity markets. To do so also implies increasing the range of pricing options, including a richer array of futures and options contracts. As these products become available, they provide important signals to agents throughout the economy, and can help to guide monetary policy even in the presence of nominal inflation rates.

Third, greater transparency in accounting practices also is an important condition for the efficient operation of equity markets. As long as independent auditing practices can be sustained, the issue will turn less on the prevailing degree of cronyism than on how institutional assets are periodically re-valued to reflect underlying economic conditions.

What about the role of international capital inflows? To the extent that they have magnified the level of East Asia's financial crisis, some have called for expanded regulation as a means of control.¹⁷ Regulation could include measures to stem excessive capital movements, while at the same time establishing incentives at the local banking level to adopt reasonable risk averse measures in the management of local and foreign exchange movements. The assumption behind such regulations is that adoption of universal transparency rules is not likely to happen overnight or automatically and there is a need to consider interim solutions along the path of financial market rules harmonization. The practical basis for considering such proposals can be seen in terms of the fact that South Korea, Indonesia, Thailand, Malaysia and the Philippines received \$93 billion in private capital inflows in 1996, and an outflow of \$12 billion in 1997. This \$105 billion in one year represented the equivalent of 11 percent of their combined GDP.¹⁸

As the events in East Asia have made clear, what was once viewed as a group of "Asian Tiger" economies now seems threatened, much as the species after which they have been named. This does not mean that the fundamentals of East Asia's growth potential have disappeared. What it does suggest is that there is a value to avoiding future financial crises and that the key to doing so is to adopt the kind of transparent practices and flexible asset choices put forth here. Since other countries have adopted similar open practices, there is every reason to expect that East Asian countries eventually will do likewise.

¹⁷ Joseph Stiglitz, "Boats, Planes and Capital Flows", *The Financial Times*, March 25, 1998, p. 14. Stiglitz, who is chief economist at the World Bank, proposes the elimination of tax, regulatory and policy distortions that lead to excessive capital inflows. In addition, he argues for the adoption of bank regulations to limit local bank currency exposure, notably incentives to induce a prudent mix of short and long-term debt obligations that could reduce both currency and bank earnings fluctuations. Further, he suggests that one should consider limits on the extent of tax deductibility for interest in debt denominated or linked to foreign currencies.

¹⁸ "The Perils of Global Capital," *The Economist*, April 11, 1998, p. 52.

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