

# **Understanding A Mechanism of Financial Crisis and Recession: Cases of Korea and Japan**

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## I . Introduction

The financial crisis of the late 1980s to 1990s occurred in the United States, Europe, Japan, and Newly industrialized East Asian countries has been viewed among economists as one of the most serious economic problems of the 20<sup>th</sup> century, in addition to the Great Depression of the 1930s. The financial crisis hitting Korea in the half of 1997 had impact on the overall economy such as the worst recession, unemployment in the post-war era. After only two years after the crisis, the performance of Korea's economy was outstanding, showing the recovery from the crisis and the struggles for economic reforms and restructuring across sectors. Japan's economy has also been experiencing a decade prolonged recession, the highest rate of unemployment and serious financial problems after the burst of bubble out of a long boom generated in financial and real estate sectors. Why did this financial crisis in Korea happen and how the economy has turned around back to the fast recovery? What lessons from the financial crisis and recovery in Korea and from the similar financial and bank crisis and the prolonged recession in Japan? This paper address these questions by focusing structural aspects and an asymmetric information framework to understand the causes and the propagation mechanism of the financial crisis in Korea and Japan.

## II . The Causes and Channels of Financial Crisis

### 1. What is a Financial Crisis ?

A *financial crisis* is defined as a major disruption in financial markets in which adverse selection and moral hazard problems become worse, so that financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities<sup>(1)</sup>.

The financial system should perform the essential function of channel-

ing funds to those individuals or firms that have productive investment opportunities. In order for the financial system to function well in this sense, it is required participants in financial markets to be able to make accurate decisions about which investment opportunities are more or less creditworthy. However, the financial system may not function well because it usually confronts problems of asymmetric information, in which one party to a financial contract has usually better information about the potential return and risk associated with the investment projects they plan to undertake than lenders do.

Among explanations of financial crises, the view that financial crises primarily result from information problems, which is explained in this section, has drawn attentions recently. In particular, it is argued that financial crises arise when disruptions to the financial system due to asymmetric information cause such a large surge in adverse selection and moral hazard problems that financial markets are unable to channel funds efficiently from savers to investors.

Before discussing the causes of financial crisis, it is useful to discuss how asymmetric information leads to adverse selection and moral hazard. *Asymmetric information* is said to exist between a buyer and seller of an asset or a contract if one party has insufficient knowledge or imperfect information about the other party involved in the transaction to make accurate decisions.

*Adverse Selection* in Financial Markets: Adverse selection is a problem that arises for *buyers* of assets or contracts when they have difficulty assessing the quality of these assets in advance of purchase. It is a *lender's problem* of distinguishing the good-risk applicants, or their business plans of investment projects, from the bad-risk applicants *before* making contracts, hence a investment decision. Consequently, it is a

problem that arises because of asymmetric information between buyers and sellers of assets *before* any purchase agreement takes place. Specifically, the adverse selection problem means that steps taken by buyers to protect themselves against purchases of poor quality assets may have the perverse effect of lowering the average quality of the pool of assets that sellers bring to the market. In short, adverse selection is an adverse *pool* effect.

Adverse selection is a serious problem in financial markets, because financial transactions are intrinsically characterized by asymmetric information. Borrowers, sellers of financial assets, generally have private information that is more accurate than the information possessed by lenders, buyers of financial assets, regarding the attributes and prospects of borrowers. Consequently, a lender may still be uncertain about the default risk of a loan contract even after checking into the risk factors for a borrower<sup>(2)</sup>.

The most obvious possible solution to adverse selection in financial markets is, in theory, the improvement of imperfect information or the elimination of the asymmetry in information that exists between buyers and sellers of financial assets *prior to* purchase agreements.

*Moral Hazard in Financial Markets:* Moral hazard is said to exist in the context of a financial market if, *after* a purchase agreement has been concluded between a buyer and seller of a financial asset: for example, the seller changes his or her behavior in such a way that the probabilities, that is, risk calculations, used by the buyer to assess the quality of the financial asset are no longer accurate; the buyer of the financial asset is only imperfectly able to monitor or observe this change in the seller's behavior<sup>(3)</sup>. That is, moral hazard arises in a financial market after a financial transaction has taken place, when the seller of a financial asset

has an incentive to conceal information and to act in a way that may not reflect interests of the buyer of financial assets. Thus, the moral hazard has important consequences for financial structure and financial system. Ways to solve this issue is related with an ability or costs associated with a lender's verifying that borrowers are using their funds as intended.

## **2. Why Financial Instability or Crisis Occurs?: Causes and Channels**

Why financial instability or crisis occurs? According to asymmetric information analysis, financial intermediaries, particularly banks, have a very important role in financial markets in that they are well-suited to engage in information-producing activities that encourage channeling funds among sectors to facilitate productive investment for the economy. The weak role of these institutions, such as financial intermediation and the supply of loans, will lead directly to a decline in investment and aggregate economic activity. One explanation why the weak role of financial system leads to downturn in real economic activity is as follows. When shocks to the financial system make information problem worse, the credit for lending available tends to decline or dry up. The financial constraints due to the lack of credit leads households and firms to cut or to delay their spending, resulting in a contraction of economic activity. Sometimes, a drastic or major disruption in financial institutions or financial markets, called financial crisis, results in a sharp drop in real economic activity, called severe recession or low growth of an economy.

Four categories of factors can result in increases in asymmetric information and thus can induce to trigger financial instability and crises: deterioration of financial sector balance sheet, increase in interest rates; increase in lender uncertainty; asset market effects on balance sheets of nonfinancial sector. These factors will help understand why banking

and financial crises occur and how they reduce to sharp contraction in aggregate economic activity. Mishikin (1999, 2000)

### **Deterioration of Financial Sector Balance Sheets**

According to the literatures on asymmetric information and financial structure, financial intermediaries (commercial banks, thrift institutions, finance companies, insurance companies, mutual funds and pension funds) play an important role in the sense that they have both the ability and the economic incentive to address asymmetric information problem with which participants in financial system confront. Banks and other financial intermediaries have economic incentives and the ability to collect and produce information when they consider making a loan. Comparing to stocks market, the loans are private and not traded because other investors cannot buy the loan directly, not simply following pattern of others. Thus the ability to lend loans by banks reduces free rider problem and moral hazard. These natural advantages of banks explain why banks and other intermediaries have such a special important role in financial markets through the world. Their roles in the financial system imply that if their ability to lend is not well-functioned or impaired, overall lending will decline and the economy will contract. A deterioration in the balance sheets of financial intermediaries indeed hinders their ability to lend and thus a key determinant of promoting financial crises<sup>(4)</sup>.

Evidences from Korea and Japan suggest that it seems to be important to understand a channel of the balance sheets through which economic crises could be transmitted to sectors between corporate (non-financial) sector and financial sector because it also reflects the structural aspect of financial system. This micro-level aspect of propagation mechanism will give us useful implications to have a deep and full scale mechanism of

financial crisis.

The mechanism of balance sheet effect works as follows: declining asset prices reduces the value of collateral that borrowers can use to secure loans. There are two effects on balance sheets: direct and indirect. A fall in price of real estate assets such as land and house prices directly reduces the value of collateral on a loan secured by the real estate. A fall in firm's stock price may signal, from the investors or through stock market, declining future cash flows that can be used to payoff debts. In short, factors or channels affecting balance sheets of non-financial sectors include change in the value of collateral due to decrease in asset price, change in market value of firm's "net worth," which perform a similar role to collateral, due to decline in stock market, unexpected changes in the rate of inflation.

Through these channels mentioned above, decrease in asset prices<sup>(5)</sup> could induce a sudden downturn of aggregate real economic activity in Korea or a prolonged recession in Japan. It is worth to note a kind of multiplier effect which is originated financial sector: the decline in aggregate activity further reduces asset prices, which perpetuates the downturn, deepening recession, that is, severe and prolonged recession. This financial propagation mechanism is called as "*financial accelerator*". One example has been transparent in Japan. The collapse of asset price such as land and stock prices in Japan, beginning with after bubble burst between the late 1980s and early 1990s, induced banking crisis that helped generate downturn in real activity, causing the long depression in Japan.

### **Increases in Interest Rates**

The adverse selection due to asymmetric information can lead to "credit rationing," in which some borrowers are denied loans even when



they are willing to pay a higher interest rate. When market interest rates are driven up sufficiently, for some reasons<sup>(6)</sup>, there may will be a situation with an insufficient supply of loanable funds, the excess demand for loanable funds at the original interest rate, called as a “*credit crunch*”. In this case where interest rates in a credit crunch will tend to rise, adverse selection may become a problem, possibly leading to “*credit rationing*” in which some borrowers are denied loans even when they are willing to pay a higher interest rates<sup>(7)</sup>.

Prudent borrowers such as individuals, firms or investors, who pursue modestly risk investment projects with modest expectation of gains may be discouraged from borrowing and are more likely to decide to exit the market for loanable funds. Borrowers with the highly risky investment projects that promise the possibility of a high return rate, though not with high probability, are those who are willing to pay the highest interest rates<sup>(8)</sup>. Lenders anticipating this adverse selection effect, may then become discouraged from lending, which would shift the supply curve even further to the left. In this setting, a higher interest rate leads to even greater adverse selection. That is, the highest interest rate increases the likelihood that the lender is lending to a bad credit risk.

In short, the original shock to the supply curve of funds that caused it to shift to the left could be followed by further leftward shifts due to adverse selection effects, amplifying the negative impact of the original shock on lending and borrowing activity. The result could be a substantial decline in investment, hence dimmed prospects for economic growth and development. Increases in interest rates can also have a negative effect on bank balance sheets.

The assets of a bank typically have longer duration assets than its liabilities. In this structure, a rise in interest rates directly causes a

decline in banks's net worth. This is because, in present value terms, the interest rate lowers the value of assets with longer maturity duration more than it raises the value of liabilities with their shorter duration.

### **Increases in Uncertainty and Inconsistent Expectation**

Suppose a negative financial shock occurs—perhaps an unexpected failure of a major financial firm or nonfinancial institution, previously thought to have been in good financial condition, or from a recession, or from uncertainty about the future direction of government policies. These kind of surprising negative events can lead to increased uncertainty among lenders concerning the attributes and prospects of potential borrowers.

Given this increased uncertainty, lenders become harder to screen out good from bad credit risks. The lessened ability of lenders to solve adverse selection and moral hazard problems thus may become more reluctant to lend at any given interest rate, leading to a decline in lending, investment, and aggregate activity.

In the loanable fund markets in equilibrium, the supply curve for loanable funds may shift to the left. This leftward shift, resulting in higher interest rates could then induce adverse selection effects in financial markets, causing further leftward shifts in the supply curve and hence further reductions in lending and borrowing activity.

### **Asset Market Effects on Nonfinancial Sector Balance Sheet**

The state of corporate balance sheets of nonfinancial firms has the most important implications for asymmetric information problems in the financial system. The weak state of balance sheets among borrowers will worsen the degree of adverse selection and moral hazard problems in

financial markets, thus promoting instability of financial system in broad sense. This could occur through variety of channels in the economy. Recent research includes possible ways to address asymmetric information such as collateral, the net worth.

Collateral is an important way often used by lenders to solve asymmetric problems. Collateral reduces the consequences of adverse or moral hazard because it reduces the lender's losses in the case of default. But if asset price decreases and the value of collateral falls, then asymmetric problem suddenly arises.

The *real net worth* of a corporation is the difference between what it owns (its assets) and what it owes (its liabilities), measured in real purchasing power terms. In general, the creditors of a corporation are entitled to take ownership of its assets in case of default. Thus, the real net worth of, the corporation plays a similar role to collateral not only in helping to ease lenders' fear regarding both adverse selection and moral hazard, but also in helping to encourage more responsible behavior on the part of corporate borrowers. Consequently, a wide spread deterioration of balance sheets among borrowers which result in negative shocks to the real net worth of corporations exacerbate adverse selection and moral hazard problems in financial markets and make lenders less willing to lend, promoting financial instability.

What kinds of factors make the real net worth be deteriorated ? These possible factors help understand how the reduction in net worth increases the adverse selection and moral hazard problems facing lenders and reduces investment and aggregate economic activity.

These negative shocks to real net worth can stem from a variety of factors. Among factors affecting changes in the real net worth includes negative stock market shock; negative inflation rate shock; negative

exchange rate shock; positive interest shock<sup>(9)</sup>.

In addition, an increase in interest rates on financial instruments also has a direct negative impact on the real net worth of both households and firms. All else equal, an increase in interest rate on financial instruments means that household and business borrowers must now pay more for loanable funds. Consequently, they experience a decrease in their *cash flow*, defined as the difference between their cash receipts and their cash expenditures. Decreased cash flow in turn means that households and firms are less liquid, which increases the uncertainty of lenders regarding the ability of households and firms to meet their debt obligations. As previously noted, increases in lender uncertainty can lead to leftward shifts in the supply curve for loanable funds, which leads to further increases in interest rates. In short, putting the two effects of increased interest rate together, both tend to lead to leftward shifts in the supply curve for loanable funds and hence to further interest rate increases and amplified adverse selection problems.

### III. Financial Crisis and Recovery in Korea

#### 1. The Origins of the Financial Crisis in Korea: Competing Views

There are disagreements or competing views on the main causes of financial crisis among economists. An evident split could be found between those who view the crisis as the product of a number of structural weaknesses and those who see it mainly as a liquidity crisis.

#### Structural Weakness

Strategy of economic development in Korea was successful in transforming the country from one of the poorest nations in the early 1960s to an industrialized country and a member of the OECD by 1996. This achieve-

ment of rapid economic growth at the same time created a number of structural weakness that we can also see in many emerging economies and Japan.

To those who agree this first view, the crisis is the product of structural weakness so that it is inevitable result that creates an economic environment, making Korea vulnerable to the financial crisis. They highlight vulnerabilities of the economy, ranging from bankruptcy of the *Chaebol* (Big industrial group) to political uncertainty apparent in early 1997. Among main weakness inherited in the economy, following four weakness appears to have been fundamental.

*Corporate Sector's Financial Structure:* The corporate sector had low level of profitability and high level of debt (the highly leveraged corporate financial structure), reflecting the tendency of the business conglomerates to diversify across a wide range of activities. Such an approach was encouraged by a weak corporate governance framework and the moral hazard resulting from “a too big to fail” mentality. This was partially due to a consequence of industrial policy implemented by government at the early stage of economic growth.

*Financial System Distorted and Underdeveloped:* Financial system of Korea had been poorly-functioning in that it followed government direction in allocating capital and had poor credit analysis and internal risk control mechanisms. This becomes the main object of the financial reform and restructuring after the crises.

*Financial Liberalization and Short-term Orientation of Private Sector's Debts:* Following comprehensive financial deregulation and the liberalization of capital market (mainly, short-term overseas borrowing) in 1993, the external debt had been rising relative to GDP rapidly and continuously<sup>(10)</sup>. Rapid increase in private sector, both direct borrowing by corpo-

rate sector and bank borrowing to finance investment by corporate sector accounted for the most of the growth in external debt. The external debt by both corporations and financial institution has been built by a high level of short-term foreign debt, reflecting excessive risk-taking and insufficient attention to credit and exchange rate risks.

*A lack of transparency and the investor confidence:* These weaknesses were compounded by a lack of transparency, which made investors uncertain about trends in key variables, such as foreign debt, foreign exchange reserves and non-performing assets. Increase in uncertainty resulted in the loss of investor confidence.

According to this view, the crisis was interpreted as an almost inevitable punishment for the sins of “crony capitalism.”

### **A Liquidity Crisis**

According to the second view of liquidity crisis, the essence of the crisis was that foreign banks refused to roll over short-term debt, offering various reasons why foreign bankers were unwilling to do that. They pay attentions to typically not only the fact there were mistakes in economic management, but also such factors as contagion effects from other countries and the herding behavior of foreign investors.

This view argues, emphasizing short term capital flow, that in almost every situation, countries with short-term liabilities to foreign bankers that exceed reserves were likely to experience a sudden and massive reversal in capital flows. Furthermore, greater short-term exposure was associated with more severe crisis when capital flows reverse. They refer this “self-fulfilling confidence crisis” in that countries set themselves up for trouble because they had far more short-term debt than they did the resources or reserves to rapid repay skittish creditors<sup>(11)</sup>. This in-

duced capital flight or refusal to roll-over which result in once-boom and sudden cash.

## 2. Chronology of Korea's Financial Crisis

What happened in Korea's crisis? In order to prevent second crisis, it is necessary to understand channels through which shocks were transmitted to yield financial crisis we could observe. The chain of events leading to the crisis began with unfavorable external shock, that is, the terms-of-trade shock in 1996<sup>(12)</sup>, which was primarily due to the significant fall in the prices of export goods such as semiconductor chips, steel, and chemical products, especially, the collapse of semiconductor prices<sup>(13)</sup>. This terms of trade shock put heavy pressure on the already thin profit margins of firms: both the large corporate (conglomerates) and the small and medium-sized firms closely tied to them. This external pressure exacerbated the balance-sheet problems of Korea's highly-indebted corporate sector: corporate sector's net income turned negative in 1997, leading to major corporate bankruptcies or insolvencies in 1997<sup>(14)</sup>: a 50 percent jump in bankruptcies and the collapse of seven of the 30-largest *chaebols*. The problem in corporate sector spilled over into the financial sector, increasing the amount of non-performing loans (NPLS). The accumulation of these problems in the banking system (exploding NPLs) and financial sector in general (deterioration of the overall soundness), caused investors to re-evaluate the risks of investing in Korea. To make matters worse, Korea's financial structure of private sector and the government's attempts to intervene in foreign exchange markets to stabilize the value of the currency, *won*, made investors more uncertain about liquidity and ability to service short-term foreign debt.

The private sector with financial structure characterized by a large

short-term oriented foreign debt, which was driven by mainly banks and the large firms (big conglomerates), became increasingly vulnerable to external shock, implying highly mismatched external asset position. The lack of transparency regarding foreign exchange reserves and total external liability positions also significantly contributed to the loss of the nation's credibility, thereby resulting in the loss of investors' confidence in the international financial markets. Through periods prior to most of 1997, foreign lenders took comfort based on the expectation that Korean government was capable of rendering support if needed, especially to the Korean banking system. However, the expectation was reversed and the problem became serious in early December 1997, when it was revealed that the central bank, the Bank of Korea, had already committed the bulk of its reserves to foreign branches of Korean banks. With usable official reserves below \$10 billion and short-term external debt in the range of \$100 billion, there was an acute market expectation and realization that, even if the Korean government wanted to support external obligations of domestic banks or corporations, it might not have the resources to do so.

Financial markets were highly focused on the large gap between short-term external debt and usable reserve. In the final days of December 1997, there was an incipient financial melt-down even though the president-elect had committed a far-reaching IMF adjustment program. When foreign banks refused to roll over their loans, Korea was forced to turn to the IMF for assistance in December 1997<sup>(15)</sup>.

### **3. Propagation Mechanism of Financial Crisis**

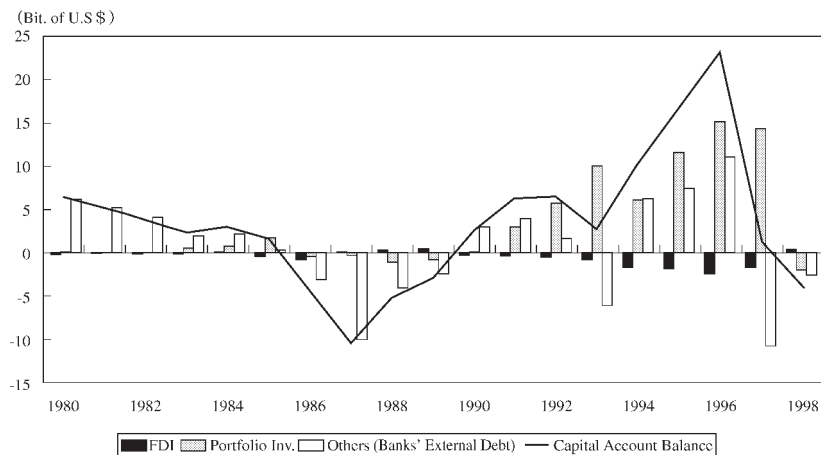
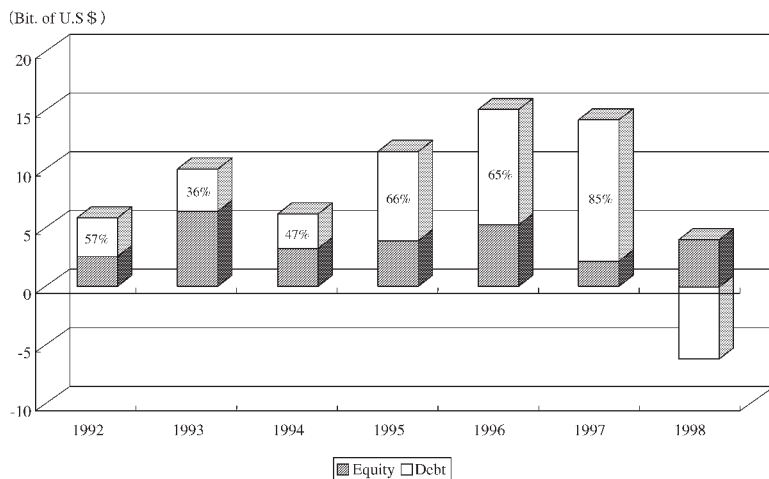
To have better understand about the mechanism of financial crisis outlined in the previous section, we can divide series of events into two stages: the first stage is from changes in economic environment such as



financial liberalization and deregulation to the currency crisis, the next stage is the process from currency crisis to financial crisis.

### **(1) The First Stage to Currency Crisis**

The first stage to the currency crisis typically has been financial liberalization such as deregulation on interest- rate ceiling and the type of lending. The Korean economy experienced net capital inflows since 1990. Once financial liberalization was adopted, the inflow of international capital into banks as well as the portfolio investment (foreign purchases of Korean stocks and bonds) have been dramatically increased especially for three years from 1994 to 1996. In this period, the dominant type of capital transaction was debt contracts, which account for the most of total foreign portfolio investment. On the other hand, stock investment by foreign investors was the limited portion of capital inflows because there was a quantity restriction on stock investment by foreigners. This was why the surge in net capital inflows resulted in a rapid increase in external debt in Korea. This capital inflow was further aggravated by government's exchange rate policies, pegging exchange rate to the dollars.

**Figure 1 Trends and Composition of Net Capital Inflows to Korea****Figure 2 Composition of Portfolio Investment**

Source: IMF (2000)

**Table 1 Stock of External Liabilities, Korea 1994-99**  
(in billions of US dollars)

	1994	1995	1996	1998	1999 Q3
Short-term external liabilities	53.7	71.6	93.0	30.7	35.0
(Percent of total external liabilities)	(55.4)	(56.3)	(56.6)	(20.6)	(24.8)
I. Financial institutions	44.7	58.6	73.0	18.9	19.4
A. Domestic financial institutions 2/	35.5	47.6	60.0	11.3	10.7
Resident domestic financial institutions 3/	10.3	18.7	26.1	6.3	6.9
Off-shore banking of domestic financial insti	3.1	3.9	7.5	2.0	1.0
Foreign branches of domestic financial insti	22.0	25.0	26.4	3.0	2.8
B. Branches of foreign banks 6/	9.2	11.0	13.0	7.6	8.7
II. Domestic corporation 7/8	9.0	13.0	20.0	11.8	15.5
Medium and long-term external liabilities	43.3	55.5	71.4	118.0	106.0
(Percent of total external liabilities)	(39.9)	(44.6)	(43.7)	(79.4)	(75.2)
I. Financial institutions	20.5	31.0	43.5	52.0	46.9
A. Domestic financial institutions 2/	18.8	28.7	40.0	45.8	42.0
Resident domestic financial institutons 3/	12.5	17.2	23.0	28.2	25.8
Off-shore banking of domestic financial insti	3.9	7.8	11.7	9.9	8.9
Foreign branches of domestic financial insti	2.4	3.7	5.3	7.8	7.3
B. Branches of foreign banks 6/	1.7	2.3	3.5	6.3	4.9
II. Domestic corporations 7/8	15.6	17.9	21.8	29.4	31.0
III. Public Sector	7.2	6.7	6.1	36.5	28.1
A. IMF	—	—	—	16.9	6.0
B. World Bank 9/	2.0	1.8	1.8	7.5	8.5
C. Asian Development Bank 9/	0.5	0.4	0.4	4.0	4.0
D. Market financing	0.0	0.0	0.1	4.2	4.2
E. Other	4.7	4.4	3.8	3.9	5.4
Total external liabilities	97.0	127.1	164.4	148.7	141.0
Memorandum item :					
Borrowings of nonresident nonfinancial					
Korean corporations 9/	22.5	32.5	46.2	40.6	...

Source: IMF (2000), Korean authorities; and staff estimates.

1/Excluding nonresident holdings of domestic bonds, estimated at U\$0.8 billion at end-December 1998.

2/Includes commercial banks, specialized banks, merchant banks, and development institutions.

3/Includes commercial paper, call money, refinance, and term loans.

4/Domestic financial institutions' offshore borrowing, excluding interoffice accounts.

5/Domestic financial institutions' overseas branches and subsidiaries, excluding interoffice accounts. The data in the table exclude the nonresident deposits in the overseas branches and subsidiaries of domestic financial institutions.

6/Includes nonresidents' deposit, call money, refinance, term-loan, and interoffice account borrowings.

7/Includes trade credit, loans for oil imports, and advance receipts of export.

8/In line with international standards, these data exclude nonresident subsidiaries of Korean corporations.

9/Including structural adjustment lending beginning December 1997.

Who were involved in the increase in external debt during the period? The banking sector was involved in 70% out of the total increase in external debt, while the corporate sector's external debt related to trade financing explained the remaining 30% of total debt. However, note that merchant banks which were affiliated or owned by corporations of big business groups, Chaebol, were also aggressively involved in the growth of external debt. Why does international capital inflow to banks in the emerging market economies? First, there were new profit opportunities in domestic financial markets due to deregulation arbitrage. Second, banks paid high yields in order to attract funds to rapidly increase their lending, loan. Third, such investment projects funded by banks were assumed to be protected by a government safety net.

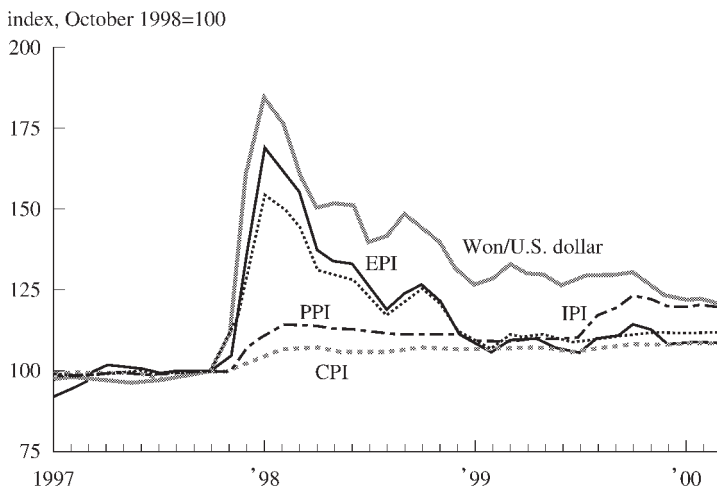
The capital inflows fueled a lending boom in banking sector. In the process of lending, the general attitude to lending was excessive risk-taking on the part of banks<sup>(16)</sup>, which led to huge non-performing loan. This resulted in deterioration of balance sheets in banks and other financial institutions. The condition of balance sheets was also deteriorated by changes in asset market such as a decline in stock and land prices as well as the high degree of illiquidity of loan assets. This deterioration of balance sheets in financial sector, by itself, might be sufficient to induce a financial and economic crisis. This was because the resulting credit crunch to restrict lending or bank insolvency could stagger the economy. The weak state of the banking sector before crisis set the stage for the currency crisis. That is one aspect of the vulnerabilities to external shocks.

One important determinant of private sector's behavior including firms and financial institutions is their expectations toward government behavior. They assumed governments' implicit guarantees to banking sector

in the wake of a severe banking crisis so that claims on banks guaranteed by government played a similar role to deposit insurance from banks' perspective. Thus, in the presence of deposit insurance, there were incentives in the behavior of insured banks to seek to maximize the value of their deposit insurance options by selecting the riskiest available portfolio<sup>(17)</sup>.

Expectations by private sector induced market participants to revise upward their expectation of future government deficits, which would be sources of cost in the case of financial crises as a form of bail-out through public fund. Given the structure of government financing, that is, the difficulty of raising tax revenues or lowering government expenditures in the wake of a severe banking crisis, the private agents expected that future deficits would be financed, at least in part, by higher seigniorage revenues. This led to expectation of higher future inflation rates and a reduction in the demand for domestic currency. The resulting drain on official reserves of foreign currency triggered the currency crises.

Evidence shows that Korea experienced severe currency crises in the latter part of 1997. The exchange rate defined as the price of a dollar in units of local currency, *won*, underwent very large depreciations in a short period of time. Import and export prices increased much higher in response to movements in the exchange rate than either the CPI or PPI. The CPI in Korea rose 7.2 percent between October 1997 and October 1998.

**Figure 3 Prices in Korea**

Notes: EPI is Export Price Index; IPI is Import Price Index; PPI is Producer Price Index; and CPI is Consumer Price Index.

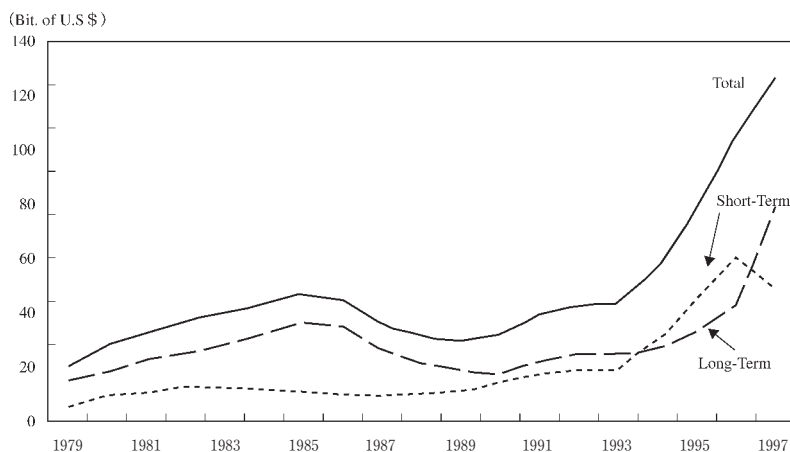
Source: "Statistics" at [www.bok.or.kr](http://www.bok.or.kr) and Datastream.

## (2) The Second Stage from Currency to Financial Crisis

Because many financial institutions did not hedge the currency mismatch in their assets and liabilities, the currency crises deteriorated the weak situation of financial sector and further exacerbated the initial banking crises and raised the associated fiscal costs. The major portion of external debt could be explained by banking sector. Out of total debt increase before three years, 1994–1996, the external debt by banking sector explains about 70 percent of the growth of external debt, while corporate sector explains 30 percent. Note that the value of foreign currency liabilities of overseas branches of banks was comparable, even much larger to the external debt of domestic branches. See Table 3. The reason for banks to exploit to increase borrowing through foreign branches is that as a part of liberalization measures, banks and other

financial intermediaries were allowed to open and expand operations of oversea branches.

**Figure 4 Trend and Composition of External Debt**



With a weakened banking sector, it is difficult for the central bank to defend the domestic currency against a sharp devaluation of the currency (or/and floats of the currency) or it could not resist the attacks. This is because the attempt to defend the currency would be too much harm to the weakened banking sector<sup>(18)</sup>.

The effect of currency devaluation on the economy depends on the structure of debt markets. The structure of debt markets, combined with currency devaluation, will transmit the effect of currency crisis into the full-fledged financial crisis, amplifying the impact of initial balance sheet fundamental effect. The particular features of debt contracts were the short duration of debt contracts and their denomination in foreign currencies, that is, short-term liabilities denominated in foreign currencies. Since many debts were denominated in foreign currencies,

**Table 2 Official Foreign Reserves During Crisis in Korea**

(U.S\$ billion)

	1996.12.31	'97.3.31	6.30	9.30	10.31	11.30	12.31	'98.1.31
Official Foreign Reserves (A)	33.2	29.1	33.3	30.4	30.5	24.4	20.4	23.5
Overseas Branch Deposits (B)	3.8	8.0	8.0	8.0	8.0	16.9	11.3	10.9
Others (C)	•	•	•	•	0.2	0.2	0.2	0.2
A-(B+C)	29.4	21.1	25.3	22.4	22.3	7.3	8.9	12.4

Source: Bank of Korea

**Table 3 Foreign Currency Liabilities of Korean Banks**

(US\$100million)

	1992	1993	1994	1995	1996	1997
Domestic Branches	157	163	226	363	507	387.9
Foreign Branches	201	231	317	413	529	312.5
Sum	358	394	543	776	1,036	700.4

Source: Bank of Korea, Dooley and Shin (2000)

**Table 4 BOK's Foreign Currency Deposits in Korean Banks**

(US\$100million)

	1997.11/3-11/7	11/10-11/14	11/17-11/21	11/24-11/28	Sum
Domestic Branches	-9.9	-10.6	35.0	41.2	55.7
Foreign Branches	0.5	7.9	19.4	61.3	89.1
Sum	-9.4	-2.7	54.4	102.5	144.8

depreciation of their currencies causes their indebtedness in domestic currency terms, even though the value of their assets remains unchanged. Furthermore, the short duration of debt contracts increased the probability for firms to default under the currency crisis, the collapse of currencies.

The currency crisis, which caused a sharp deterioration in both financial and non-financial sector balance sheets, was transmitted to a contrac-



tion in lending and a severe financial and economic crisis. Financial market was then no longer able to channel funds to those with productive investment opportunities, which led to devastating effects on the economy as a whole.

The causes of currency and financial crisis could be reflected by through which the currency crisis causes financial crisis to occur: through the direct effect on the balance sheets of firms, through the further negative effect on the balance sheets of the banking sector, and through the effect on higher inflation<sup>(19)</sup>.

Externalities of an economy can be measured by variables such as gross external liabilities, the ratio of external liabilities to GDP, the short term external liabilities relative to total external liabilities, and the ratio of short-term liabilities to foreign exchange reserves.

Gross external liabilities had been growing at rate exceeding 30% from 1994 to 1996, a period of comprehensive capital account liberalization. The amount of external liabilities relative to GDP was also rising rapidly over the same period, rising from the 20% level prior to 1994 to above 30% by 1996 and 1997. A rapid increase in private sector borrowings—both direct borrowings of the corporate sector and bank borrowings to finance investments of the corporate sector—accounted for most of the increase in external debt.

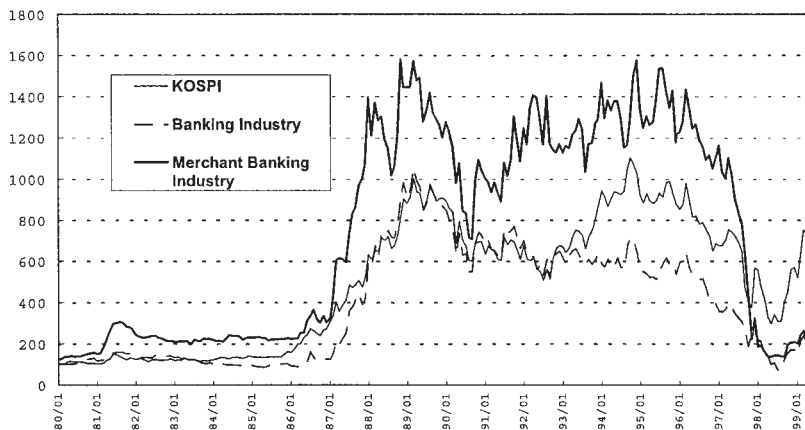
With regard to the external liability to GDP ratio reached a level around 33% in 1997, the issue is whether the level itself was probably not an unsustainable one, given Korea's potential economic growth. The other problems with regard to external debt lay in the relatively high portion of short-term external debt, and the term-mismatch, which was a possible signal of serious external liquidity problems.

Indeed the critical cause of financial crisis of Korea arose from the fact

that, throughout the 1990s, the share of short-term liabilities out of total external liabilities remained at a level of more than 50% while the foreign exchange reserve position was not sufficient to cover the short-term external liabilities. In other words, the buildup of short-term debt that financial and capital-account liberalization engendered during 1990s made the structure of Korean economy vulnerable to external shocks such as reversal in market sentiment.

There are valuable implications from stock market before the crisis, which is worth noting. The value of the banking and finance sectors fell by large amounts before the currency crisis. In the case of Korea, the manufacturing sector index show volatility but actually rose up before the crisis. Relatively sound macroeconomic indicators such as stable GDP growth, budget balance, high saving rates, low inflation, in Table 5, were disguising structural vulnerability in terms of high foreign exchange liquidity risks.

**Figure 5 Stock Market Performance of the Korean Banks**



Source: Bank of Korea

**Table 5 Macroeconomic Fundamentals in Korea**

(%)

	1991	1992	1993	1994	1995	1996	1997	1998
Fiscal Surplus <sup>1)</sup> /GDP	-1.9	-0.7	0.3	0.5	0.4	0.3	-1.5	-4.2
Current Acct/GDP	-2.82	-1.25	0.29	-0.96	-1.74	-4.42	-1.71	12.46
Real Effective Exchange Rate <sup>2)</sup>	93.5	98.8	100.9	98.3	98.0	96.0	104.6	131.1
CPI Inflation	9.3	6.3	4.8	6.2	4.5	4.9	4.5	7.5
Real GDP Growth	9.2	5.4	5.5	8.3	8.9	6.8	5.0	-5.8
Gross Savings Ratio	37.3	36.4	36.2	35.5	35.5	33.8	33.4	33.2

Notes: 1)Consolidated public sector.

2)Trade volume weighted, numbers below 100 means overvaluation.

Source: National Statistical Office, Bank of Korea, Ministry of Finance and Economy, and KDI.

#### 4. Responses to the Crisis

**Fiscal and Monetary Policy:** In attenuating the 1988 recession and in laying the foundation for an economic recovery in 1999, Korea responded to crises with tightening of fiscal and monetary policy intended to stem the collapse of the currency and restore confidence. Korea did not allow its monetary base to expand rapidly. By the end of 1998, the amount of base money became roughly same as Korea had at the onset of crisis. After the period of tight money around at the end of 1988, Korea significantly raised their money supplies about 37 percent<sup>(20)</sup>. The framework for both monetary and exchange rate policies has changed significantly since the crisis in important aspects<sup>(21)</sup>. The need for high interest rate will depend to some extent on exchange rate developments.

**Structural Reforms:** More important in a longer-term perspective was the introduction of a wide range of structural reforms. In short, the objective was to create an economic system based on market forces, with

the government role shifted from direct intervention to ensuring the sound functioning of a market economy. The policy content of the IMF programs was aimed at the structural weakness. The government pursues structural reforms in four sectors: financial restructuring, firms (*Chaebols*) restructuring, public sector restructuring, and labor sector restructuring. The major lines of these reforms included: strengthening competition by reducing trade barrier and promoting inflows of foreign direct investment; improving corporate governance to force the chaebols to focus on profitability and shareholder value; rehabilitating the financial system by re-capitalizing viable financial institutions and addressing the NPL problem; establishing a new supervisory framework for the financial sector in order to avoid future crises; reducing the government's role in the economy through the privatization of state-owned enterprises and by regulatory reform; increasing the flexibility of labor markets by loosening controls on layoffs and the use of temporary workers while strengthening the social safety net.

## 5. The Recovery from the Crisis

Two years after being hit by severe financial crisis, the performance of Korea's economy in 1999 was outstanding by almost any indicators, showing the recovery from the crisis. Growth rate of real output increase almost 11% from -7% in real output just after the crisis. Given the wide range of structural reforms, factors that result in outstanding performances are a recovery in confidence, the recovery and stabilization of the currency, favorable external conditions, technical factors, notably the large contribution of inventory adjustment, a sharp expansion in the information and telecommunication sectors.

The main contribution to the upturn was the strong rebound in domes

tic demand. The driving forces of increase in aggregate domestic demand were buoyant private consumption, a turnaround of investment in machinery and equipment and a slower adjustment of inventory decumulation. The turnaround in fixed investment hence, the fixed capital formation, was due primarily to the turn in corporate profitability<sup>(22)</sup>, the opportunities available in emerging industries such as information and telecommunications, venture businesses as emerging industries played a key role in the pick up in investment<sup>(23)</sup>.

The financial crisis resulted in the aid from the IMF to restore stability of Korean economy. Korea's initiative in implementing structural reforms helped to lay the foundation for the strong recovery beginning in the third quarter of 1998. The goal of the economic reform was not just overcome financial crisis at hand but to establish a new economic paradigm in which market principles function effectively and transparently. That was only way to regain the credibility of international community.

While many legal and regulatory reforms have been introduced, the challenge now is to implement effectively the reforms so as to change behavior of all sectors: household, firms, and government, who are participating in the new reformed economic environment after the financial crisis.

#### **IV. The Prolonged Recession and Banking Crisis in Japan**

There have been various arguments and debates regarding the economic performances of Japan which could be among others represented by the slow growth, the prolonged recession, and the financial sector's problem. Here, we should light on the issues from three aspects: demand side and supply side. We also focus on the effect of asset volatility in Japanese economy.

## 1. Demand Side Diagnosis

The prolonged recession in Japan during 1990s could be partially explained by the financial propagation mechanism which focused on the collapse of asset prices and its effects on banking sector and corporate, especially the effect on the balance sheets of corporate and financial sectors, among others.

The combination of these two factors, such as decrease in stock and real estate prices after the burst of bubble (*asset deflation*) and decrease in lending by banks (*kashi-shiburi*), had adverse effect on aggregate demand. These factors induced a downturn in aggregate real economic activity through declining expenditure of consumption and investment by household and firms. Weak investment with financial constraint due to credit crunch contributed to make the recession be deepened and prolonged<sup>(24)</sup>.

The result has been an adverse shift in aggregate demand, leading to low growth and low inflation. Inflation in Japan was indeed negative, equivalently prices declines, in 1995 and 1996. Deflation is an important issue to be explained to understand the recession in Japan.

### (1) Financial Sector: Asset Market and the Behavior of Banks

Recent decrease in asset prices had impact on financial sector through deterioration in the private sectors' balance sheets because declining asset prices reduce the value of collateral that borrowers can use to secure loan. In this situation, banks (and other financial intermediaries making loans), which have a substantial contraction in their capital, will face two choices: either cut back their lending (*a capital crunch*); or can try to raise new capital. Recent experiences in Japan showed that financial intermediaries, particularly banks with weakened balance sheets, led to a capital

crunch which in turn contributed partially recession and lower growth during 1990s.

## **(2) Non-financial Corporations Sector: Asset Market and the Behavior of Firms**

Non-financial corporation sector in Japan have been suffered losses on their assets holdings, about half each in land and equities<sup>(25)</sup>. A wide-spread deterioration of balance sheets among firms, mainly borrowers, worsened both adverse selection and moral hazard problem in financial markets, thus promoting financial instability. Given weak banking sector, credit crunch, and financial constraint, firms reduced or delayed investment projects, which were one of main factors leading recession and slow growth. The reasons or channels of spillover effect through balance sheet are as follows:

*Direct channel through collateral:* If a borrower defaults on a loan, the lender can sell the collateral to make up for at least some of the loss on the loan. But if asset prices fall, and the value of collateral falls as well, then the balance sheet of financial sector is deteriorated.

*Net worth and Stock market:* If a firm has high net worth, then even if it defaults on its debt payments, the lender can take the title to the firm's net worth, sell it off, and use the proceeds to recoup some of the losses from the loan. A sharp decrease in stock price reduces the market valuation of a firms' net worth, and thus little incentive to reduce NPLs.

*Unexpected changes in the inflation:* In Japanese economy in which inflation has been moderate for long period of time so that debt contracts with long duration have interest payments fixed in nominal terms for a substantial period of time. However, as a recent deflation such as decreases in real asset prices has occurred, the value of firm's liabilities

in real terms rises and, as a result, its net worth in real terms declines.

## **2. Supply Side Diagnosis**

In the longer horizon, the problem of banking system could lead an adverse shift in aggregate supply. Banking system (or financial system) in bad shape will induce cost of supply side to increase. The problem of Japan in the 1990s as being due in part to the problem of its banking sector seems to have led to the adverse impact not only on both aggregate demand but also on aggregate supply. In the medium run, the shift in aggregate supply may contribute a long duration of recession for a nearly decade, in addition to shift in aggregate demand in the short run.

Whether and how do financial sector affects the supply side of Japanese economy such as the productivity as a whole and the sectoral productivity? What are impediments in linking aggregate supply and demand? These are open questions to be answered to improve understanding about Japanese economy.

## **3. The Effect of Asset Price Volatility**

During the past two decades, Japanese economy has experienced large boom-burst cycles in the prices of various assets, represented by prices of equities and real estate such as stocks, land, residential housing. Asset price fluctuations has been argued as one of factors which attributed the boom period of 1980s and repression in 1990s in Japan. The collapse of the Japanese asset markets, real estate and stock, in the early 1990s had been influenced the real economic activity through various channels.

One of the reasons why fluctuation of land and equity prices is important is the role of asset in the credit market and the impact of values of assets on investment. A large fraction of business investment in Japan is



financed by loans through banks and financial intermediaries that require collateral<sup>(26)</sup>. Thus a large fraction of business investment projects financed by secured loans is likely to be affected by endogenous changes in the value of collateralizable assets. Further, land has served as a primary collateral in the investment financing of Japanese corporations. Of total secured bank loans about 45% have been collateralized by land, while only about 3% have been backed up by stocks and bonds. Thus land prices might be closely related to real activities in Japan.

This has particularly been the case since the financial liberalization in the early 1980s. Financial liberalization caused a rise in stock prices, which enabled firms to raise funds by issuing equity and bonds which are alternative to loans from bank. This in turn prompted banks to lend funds to firms without access to credit markets. But at that time, those firms which had not established long-term relationships with banks and thus land held by them served as collateral. In this way, land became very important as collateral in Japan<sup>(27)</sup>.

Land values held by the corporate sector, particularly by small businesses, rose dramatically with the asset price inflation in the mid of 1980s. The land value owned by corporations in all industries was approximately 50 trillion yen in 1984 and rose to around 120 trillion yen in 1990. Of the net increase in land values about 75% was purchased by small firms. Thus, if it exists, such an excessively sharp increase in land holding by small firms itself could make the magnitude of collateral effects bigger.

Given the role of asset, especially the role of land in Japanese economy, it is important to understand sources of asset price fluctuation in general and sources of land price fluctuation in order to clarify impacts on real activity and business cycles in the economy. Asset pricing model will help understand the link between financial market and the real sector of

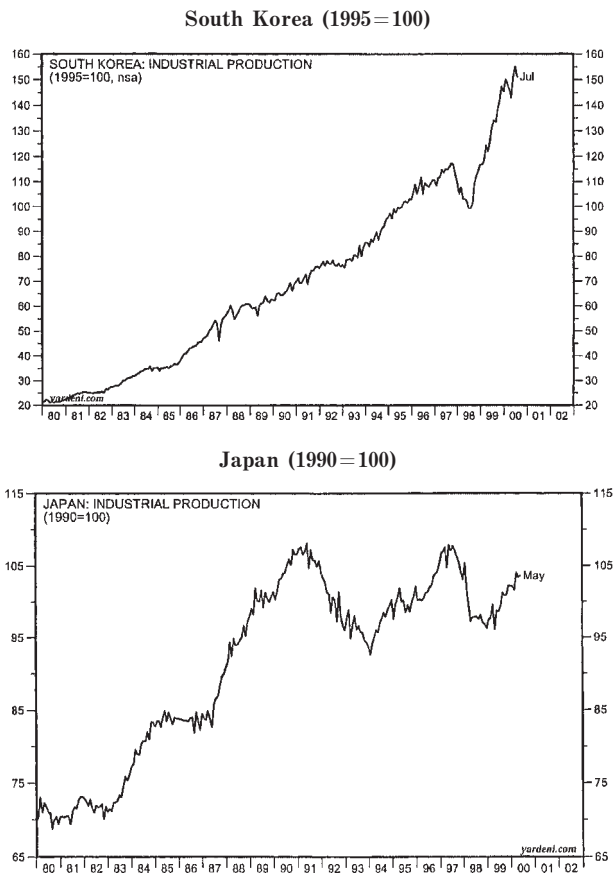
the economy.

## V. International Comparison and Discussion: Evidences from Korea-Japan

### 1. Financial System

The deterioration of balance sheets in the financial sector is an impor-

**Figure 6 Industrial Production: Korea and Japan**



Source: IMF (2000)

tant factor causing financial crises in Korea and the banking crisis and the prolonged recession in Japan. Korea experienced severe banking-financial sector crises that began before the currency crises, while Japan also experienced banking—financial crisis but did not fall into the currency crisis. This implies that changes in financial structure is an important element in the development of financial crises. This is because the deterioration of balance sheets of both the banking and corporate sectors have developed before the onset of the Korean financial crisis. Note that prior to the crisis, the loan classification criteria and loan loss provision requirements in Korea and Japan had been very lenient compared to international standards. Here we will discuss the weak balance-sheet fundamentals of Korean economy relative to Japan, especially focusing on corporate sector which, in turn, is the main borrower from the financial sector and the sources of banking crisis such as bad loans<sup>(28)</sup>.

## **2. Corporation Sector's Balance Sheet Fundamentals**

The weak corporate structure of nonfinancial sector, manufacturing sector, can be characterized by excessive debt and low profitability. Korean corporations played a pivotal role in the country's financial crisis, while Japanese firms played a similar role in the banking problem but did not fall into the financial crises as Korea and other Asian countries. Structural problem of corporation sector in both Korea and Japan can be characterized by some measurements of the structure of debt which are described in the balance sheet fundamentals.

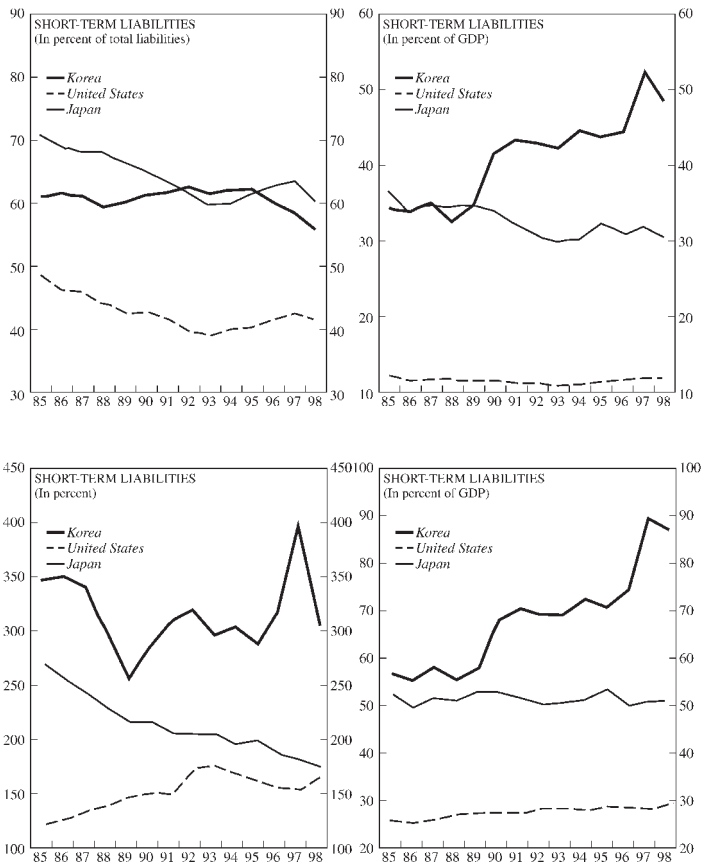
One feature of debt contracts in corporate sector is the highly leveraged corporate financial structure, which is an important source of structural vulnerability. The over-investment by firms is one factor to contribute the highly leverages financial structure in corporate sector. As firms

expanded under this corporate financial structure, the corporate sector became increasingly vulnerable to negative shocks. Firms in Korea had undertaken large investment projects and diversification drives between 1993 and 1996, financed by aggressive short-term borrowing from banks. But investment failed to generate enough returns to cover the cost of capital. Pre-tax rates of return on capital of industrial companies were below pre-tax cost of debt in Korea between 1993–1995 except the steel industry which realized profits exceeding debt charges. Excess capacity through over-investment and strong competition in the domestic and international markets made thin profit margin further thin. This total liabilities, measured in percent of GDP, of Korean firms has been continuously increasing, while the ratio of total liabilities in Japanese firms has been relatively steady. The total liability-equity ratios of Korean firms show higher than Japan during all the period, 1985–1998. The gap has been rapidly widen since 1995 and peaked just before the crisis. The ratio of Korea shows high volatility. One difference in the structure of debt between Japan and Korea is the term structure of liabilities. In contrast, the ratio has been decreasing 1980s and 1990s. Short-term liabilities measured by the ratio of GDP show the rapid increase during 1990s in Korea, but the ratio has been gradually decreasing throughout 1990s. When we look at short-term liabilities measured by ratio of total liabilities, we can find an interesting pattern of short-term liabilities. From mid-1980 to early 1990s, short-term liabilities ratio out of total liabilities in Japan is greater than one of Korea and the pattern was reversed between early and mid-1990s. However, the ratio of Korean firms is declining since 1996, while one of Japanese firms shows gradual up and down.

Korean economy is dominated by the large business groups, *chaebols*.

The top 30 chaebol produces roughly 16–17 percent of Korea’s GDP and account for about 40 percent of manufacturing GDP, around half of export, but only 5 percent of employment. Chaebols are highly leveraged

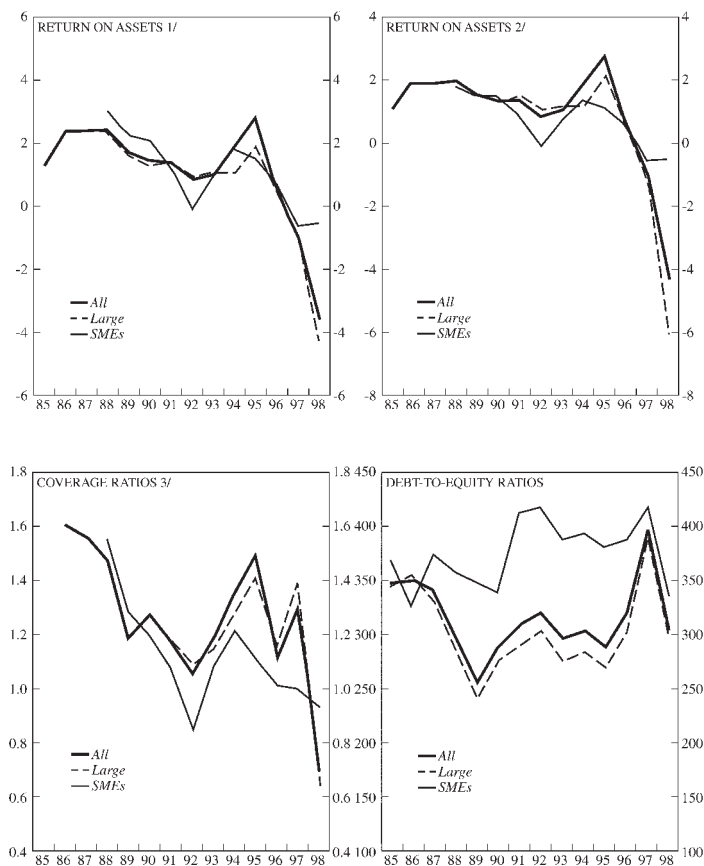
**Figure 7 Structure of Corporate Finance: International Comparison**  
**Liabilities of Manufacturing Sector, 1985–1998**  
**Korea, Japan, USA**



Sources: IMF (2000), Data provided by the Korean authorities; Japan: Ministry of Finance, Nomura database; U.S. Census Bureau, Quarterly Financial Report for Manufacturing, Mining and Trade Corporations.

and diversified. The debt-equity ratio of Korea's conglomerates (big business group) was even higher than that of small and medium size

**Figure 8 Indicators of Profitability and Debt  
Manufacturing Sector in Korea: 1985-1998  
By Size of Firms (In percent)**



Sources: IMF (2000, 95), Data provided by the Korean authorities; Japan: Ministry of Finance, Nomura database; U.S. Census Bureau, Quarterly Financial Report for Manufacturing, Mining and Trade Corporations.

1/Defined as net income as percent of total assets

2/Defined as net income as percent of sales.

3/Defined operating income as percent of interest expense.

corporation. The debt-to-equity ratio for top 30 chaebol jumped to 518 percent from 387 percent at the end of 1996, while the debt ratio in all manufacturing for large firms and the small and medium enterprises rose from 100 percent to 400 percent point between 1996 and end 1997. This was more than double of the average of Japan and OECD. This implies that excess debt was not limited to a few large business groups. This may reflect both characteristics of loan market and the chaebol's strategy of debt-financed growth and diversification in Korea. Bank lending to the top 30 rose to 43 percent in 1997. This aspect generated the high risk because as profits fell, the corporate sector became vulnerable to a cyclical downturn and change in interest rates.

The highly leveraged corporate financial structure and the high financial expenses due to high domestic interest rate had adverse effects on the profit margin in corporate sector in Korea. High debt-equity ratio combined with domestic high interest rates produced chronic difficulty for all firms (the big industrial groups and the small and medium firms).

Even during the boom periods of 1994-95 before the crisis, the profitability for the smaller chaebols was weak. The profitability of corporate sector had been steadily deteriorated before the crisis. Given this highly leveraged financial structure, the negative external shock such as the negative terms of trade shock in 1996 caused the significant decline in corporate profitability. For some firms, this meant heavy pressure for the already thin margins of profitability. The sharp decrease in profit was reflected in the deterioration of the corporate balance sheets. The effect on the profit varied depending on the size of corporate group even in the large conglomerates. The profit of smaller chaebols decreased more rapidly than the larger chaebols.

### 3. Shifts in Regulatory Regime and Financial Structure

What were factors promoting deterioration of balance-sheet fundamentals ? Despite the strong macroeconomic fundamentals, as the asymmetric information analysis indicates, Korea was vulnerable to a financial crisis because of financial conditions represented by the weak balance-sheet fundamentals for the overall economy. However, key questions naturally follow: What caused balance sheets to deteriorate in both Korea and Japan ? Why did not Japan with the deteriorated balance-sheet fundamentals get into the process from the currency to the financial crisis during the period of Asian crisis ? Are there qualitative differences in financial conditions such as the balance-sheet fundamentals ? Are there differences in terms of regulatory regime such as ways to regulate or deregulate ?

One aspect of currency crisis was the fiscal regulatory regime which could be characterized by large perspective government deficit associated with implicit bail out guarantees to failing banking system. The basic idea of this line of argument is as follows. Given this government's implicit guarantees to their banking sectors, market participants revised upwards their expectations of future government deficits. Given the structure of government financing, that is, the difficulty of raising tax revenues or lowering government expenditures in the wake of a severe banking crisis, the private agents expected that future deficits would be financed, at least in part, by higher seigniorage revenues. This led to expectation of higher future inflation rates and a reduction in the demand for domestic currency. The resulting drain on official reserves of foreign currency triggered the currency crises. Because many financial institutions did not hedge the currency mismatch in their assets and liabilities, the currency crises exacerbated the initial banking crises and raised the



associated fiscal costs.

Fiscal cost of banking crisis: This fiscal cost are measured by very large government's liabilities which arise from the implicit guarantees and the need to restructure the banking system. Research found that traditional measures of government deficit or debt gave no indication of currency crises to come in Korea and that the debt situation of government appeared radically different before and after the crisis<sup>(29)</sup>.

The other aspect often cited as the primary impetus for the subsequent credit expansion and hence deterioration of the bank asset quality leading up to financial crises, is the shift in financial regulatory regime such as financial liberalization and deregulation in financial markets without tight supervisory regulations. Both Korea and Japan had liberalized their financial systems and opened up their capital markets gradually throughout the two decades. However, they had different ways and speeds of deregulation so that the developments of debt and equity market were different. The resulting incentives and behaviors of banks (and other financial intermediaries) and nonfinancial corporations were consequently somewhat different in several respects. In Japan, deregulation allowed large bank customers to quickly shift from bank financing to capital market funding. Thus large Japanese firms, particularly manufacturers, now almost as independent of bank financing relative to the past<sup>(30)</sup>. However, deregulation was less favorable for savers, they continued to deposit their money with banks. On that stage of deregulation, Japanese banks were not allowed into new business so that their new loans primarily flowed to customers such as small business who did not have enough access to other direct financial markets but bank loan. Banks also expanded real estate lending. As a result, both actions by banks under the regulatory shift turned out to be unprofitable, accumulat-

ing large bad loans.

Credit growth in Korea was quite rapid before the crisis can be measured by the level of domestic credit of financial institutions in both real terms and relative to GDP. Although domestic credit rose to nearly 200% of GDP, and real domestic credit more than quadrupled in the decade preceding the crisis, whether a pronounced increase in the trend after financial liberalization occurred or not is not inconclusive.. In addition, although credit growth in Korea was high before the crisis, it was not as rapid as in Mexico or other East Asian countries 15 before their crises.

Financial liberalization did play an important role in increasing the exposure of financial institutions to foreign exchange risk, it may have not been as critical to creation of a lending boom as in other emerging market countries that have experienced a crisis. An alternative factor to the rapid lending growth, in turn, the deterioration in the balance sheets of the financial sector seems to be other factors than financial liberalization as a whole. We have to look at how different degree of and different speed of deregulation has been proceeded over financial sector relative to corporation sector. That is, asymmetric shift in regulation of financial sector relative to other sector may explain a formation of financial structure of balance sheet which has generated a vicious circle of a financial crisis. While regulations on financial institutions were being relaxed in order to enable them to engage in a wider set of activities, an implicit government safety net for financial institutions along with weak prudential supervision led to excessive risk-taking.

One impetus to increased short-term foreign borrowing by financial institutions was the result of not only the financial liberalization process but also a process of government regulatory shift.

In 1993, the Korean government expanded the list of usage for which financial institutions could provide foreign-currency denominated loans. Short-term foreign borrowing by financial institutions was allowed at the time, while the government maintained the quantity restriction on long-term foreign borrowing as the means of capital flow management. The result was a dramatic increase in short-term foreign debts of financial institutions to finance strong investment demand of the corporate sector as the economy entered a boom in 1994. In addition, the number of financial institutions engaging in foreign-currency-denominated activities increased sharply with financial liberalization. From 1994 to 1996, a total of 24 finance companies were transformed into merchant banking corporations. This meant a corresponding increase in the number of participants in international financial markets because merchant banks were allowed to engage in foreign exchange transactions, while finance companies were not. During the same period, Korean banks opened 28 foreign branches which gave them greater access to foreign funds. These changes in the institutional framework contributed importantly to the rapid growth in foreign-currency borrowing by financial institutions and businesses documented above.

The long standing practice of government intervention in credit allocation as well as in key managerial decision has weakened banking sector during the 1970-80s. A process of government regulatory shift to financial deregulation, without fully considering the structurally weakened banking sector, contributed to the onset of financial crisis. In the interventional environment, there were not sufficient credit analysis and, superficial supervision on the part of regulators and there were lending concentration on the part of banking industry. This kind of financial environment caused incentives to high leveraging on the part of the

corporate sector.

To have better understanding recent financial problems in both Korea and Japan, it is also important to investigate causalities between behavior of private sectors, financial sector and nonfinancial corporate sector, reflected in balance sheet fundamentals and the financial regulatory shifts. We need to decompose the aggregate regulatory shift into sectors: asymmetric or unbalanced aspect of deregulation over different sector such as banks, city and local banks, other financial intermediaries, nonfinancial corporate sector, large firms, small firms. The identification of causalities may provide us useful implications about the timing of regulatory shifts and the conditions to prevent financial crisis or to minimize the cost of financial problems in the future. Given those findings, we could discuss which *social infrastructure* should be required in the economy where individuals with large wealth are willing to make the long-term investments, channelling to investment in technology for the long-run economic success as a whole. It is useful to think of “*social infrastructure*” as the rules, regulations, and institutions that enforce them. In this way of thinking, government policies and institutions make up the social infrastructure of the economy. In this sense, they themselves are “*ideas*” which are there waiting to be found.

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## Endnotes

- (1) Mishkin (1999, 2000).
- (2) The standard “five C” risk factors for a borrower usually include

capacity (to repay), capital, character, collateral, and conditions of the economy. See Mishkin (1999).

- (3) For example, a moral hazard problem arises if, after a lender has purchased a debt security from a borrower, the borrower increases the risks originally associated with the debt security by investing his borrowed funds in more risky projects than he originally reported to the lender.
- (4) Recent research suggests that weak balance sheets led to a capital crunch which hindered growth in the U.S. economy during the early 1990s. Bernanke and Lown (1991), Berger and Udell (1994), Mishkin (2000).
- (5) Expectations of investors or stock markets are important in that asset price means the evaluation of stream of current and future's cash flows, precisely the expected value of discounted present value of current and future part of profits. In this sense, perspective toward performance of firms by investors or financial markets will affect the net worth thereby the balance sheet of corporate sector.
- (6) Due to increased demand for credit or a decline in the money supply.
- (7) Stiglitz and Weiss (1981).
- (8) It is often said that, in this case where interest rates in a credit crunch will tend to rise, good credit risks are less likely to want to borrow while bad credit risks are still willing to borrow. But it is hard for us to distinguish between good and bad credits. We only can attach the conditional probability of failure of future projects based on risks.
- (9) Negative Stock Market Shock: stock prices are the current market valuation of corporate assets. All else equal, a sharp decline in stock market prices means a decline in corporate real net worth, that

is, the market valuation of a firm's net worth.

Negative inflation rate shock unexpected changes in the rate of inflation If the debt payments specified in corporate debt contracts are fixed in nominal terms, a decrease in the inflation rate can have a substantial negative impact on the real value of corporate net worth. When inflation turns out to be less than anticipated, which can occur by an outright deflation as occurred in Japan recently, the value of firms' liabilities in real terms rises, and its net worth in real terms declines. Recall that the real interest rate is defined to be the difference between the nominal interest rate and the inflation rate. Thus, the definition of the real interest rate from period  $T$  to  $T+1$  implies that, for any given nominal interest rate, a *decrease* in the inflation rate corresponds to an *increase* in the real interest rate. This increase in the real interest rate raises the real burden of debt on corporate borrowers, and hence the real value of their liabilities, without affecting the real value of their assets. It follows that corporate net worth declines in real terms. To avoid this problem, corporations in countries with highly volatile domestic inflation rates sometimes issue debt denominated in the currencies of foreign countries whose inflation rates are expected to be more stable over time. This is not a risk-free strategy, however. As will next be seen, negative shocks to the domestic exchange rate can have substantial negative effects on corporate real net worth when corporate debt is denominated in foreign currencies.

Negative exchange rate shock: all else equal, a depreciation or devaluation of a country's domestic exchange rate will increase the real debt burden, hence the real liabilities, of any corporation whose debt is denominated in foreign currencies. On the other hand, since



corporate assets are typically denominated in domestic currency, a depreciation or devaluation of the domestic exchange rate will generally not have any direct effect on the real value of corporate assets. It follows that corporate real net worth will tend to decline following a depreciation or devaluation of a country's domestic exchange rate.

Positive interest shock: as previously noted, increased interest rates on financial instruments can increase adverse selection in financial markets and hence make lenders less willing to lend. In this case, the supply curve for loanable funds will shift left. This will tend to cause interest rates to increase even further, thus amplifying the original adverse selection problem.

- (10) The ratio of external debt to GDP reached around 25% at the end of 1997, which was not an sustainable level, given Korea's economic growth potential as Chen (1992) and Milesi-Ferretti and Razin (1996).
- (11) Rodrik and Velasco (2000) "Short Term Capital Flows", NBER WP No. 7364.
- (12) The terms of trade deteriorated nearly 20% which is the largest drop since the first oil shock of 1974.
- (13) The unit price of semiconductor chips fell by more than 70 percent.
- (14) The insolvencies of Korean big business groups in 1997 were as follows.

*Hanbo* (1.23, corporate reorganization), *Sammi* (3.18, corporate reorganization), *Jinro* (4.28, subject to agreement for preventing insolvency), *Dainong* (5.19, subject to agreement for preventing insolvency), *Hanshinkongyung* (5.31, corporate reorganization), *Kia* (7.14, corporate reorganization), *Ssang Bang Wool* (10.16, composition), *Haitai* (11.1, composition), *New Core* (11.3, composition and corporate

reorganization). The average number of firms defaulting each month during 1997 was more than 1,400, nearly a 50 percent increase from 1996. Information from Bank of Korea (1999).

Monthly Average Number of Firms Defaulting on Promissory Notes, 1993-97

	1993	1994	1995	1996	1997
Number of firms	792	983	1,166	966	1,431
Change from previous year	-11.7%	18.4%	24.3%	-17.2%	48.1%

Source: Hahm (1999, 117)

- (15) A package of \$57 billion in official support was assembled, with \$21 billion from IMF, \$14 billion from other multilateral sources, and \$22 billion in “second-line of defence” funds available from US and other bilateral sources. For series of Letter of Intent of the government of Korea, which describes the policies that Korea intends to implement in the context of its request for financial support from the IMF for details. See <http://www.imf.org/external/np/loi/mempub.asp>
- (16) The reasons why banks had excessive risk-taking attitudes: (1) the lack of risk management system to screen and monitor, such as the well-trained officers, risk-assessment systems, other experts to evaluate and respond to risk appropriately. (2) Weak financial regulation and supervision.
- (17) See Merton (1977), Dooley and Shin (2000) in this line of literature.
- (18) Any rise in interest rate to keep the domestic currency from depreciating has an additional effect of weakening the banking system further due to the negative effect on bank’s balance sheets. This effect occurs due to their maturity mismatch and their exposure to increased credit risk when the economy declines. Under this situation and the debt structure, if the central bank raises interest rates sufficiently enough to defend the currency, the banking system

may default due to sharp increase in debt payment burden. Under the recognition or expectation of the inability of the central bank to defend the currency, investors or speculators will have greater incentive to attack because expected profits from selling the currency is likely to be realized in the economy with a weakened banking sector and a non- float exchange regime.

- (19) South Korea avoided a large rise in inflation, while inflation in Mexico and Indonesia increased over 50% after the currency crisis.
- (20) Some interpreted this evidence as Korean government eventually moved to partially monetize their debt, but there was a substantial lag until they did so. Burnside, Eichenbaun, and Rebelo (2000).
- (21) The Bank of Korea became legally independent in 1998 and its governor replaced by the Minister of Finance as chairman of the Monetary Policy Committee.
- (22) The ratio of net income to total asset, 31/2% in 1999 from negative in 1997; the total borrowing to asset ratio for listed manufacturing companies, 40% in 1999 from 58% in 1997.
- (23) Venture business in Korea was boosted by a doubling in the number of Internet start-up companies to about 2400 in 1999.
- (24) Large firms in the Keiretsu had good access to credit (lending from banks) relative to small and medium size firms. Large firms which had long relation with main bank had diversified way to finance with development of capital markets such as equities, direct finance rather indirect finance such as loan from banks. Under this situation, banks have to lend funds to firms which do not have alternative way to finance but loan. This cause banks to be reluctant to or be conservative in lending behavior.
- (25) Corporations in construction sector face relatively strong impact

because of their substantial real estate holdings. The overall decrease in the value of net worth is equivalent to 16 % of their total balance sheets at the outset (OECD survey).

- (26) The degree of effect varies according to the size of firms in Japan, the share of bank loans to small/medium firms is very high. In 1988 about 75% of bank loans to manufacturing firms were received by small firms. Of total outstanding loans by all banks to all industries, on average about 50% was received by small firms. The small/medium firms that are more likely to be exposed to financial accelerator effects. Bernanke et al. (1995).
- (27) Ogawa and Kitasaka (1998) find that real activities such as investment in Japan strongly depend on land prices.
- (28) When relying on the official data in both Korea and Japan, it is difficult to conclude that there had been a substantial deterioration in bank balance sheets prior to the financial crisis. Thus, it is necessary to adjust the bank balance sheets by applying consistent criteria in order to uncover the true situation. See Hahm and Mishkin (2000, 11-17) for the adjustment of data.
- (29) Burnside, Reichenbaum, and Rebelo (2000).
- (30) T.Hoshi and A.Kashyap (2000).

## Appendix : Circulation of Propagation of Financial Crisis

Exogenous Changes in Economic Environment and Policy Regime	Financial Liberalization Inflow of⇒ International Capital (changes in the debt structure)	⇒Balance Sheet Fundamentals	Financial sector (banks and other financial institutions)
	⇒Lending Boom in Loan Market (Banking Sector) ⇒Excess Risk-Taking ⇒NPL (large bad loan) ⇔	↑ Spill over	↑ ↓
		Value of Collateral Interest Expenses [Net Worth]	Asset Markets (Credit Market)
International Market	International Business Cycles (Terms of Trade Shock) <b>Downturns</b> <b>Monetary Tightening</b>	↑ ⇒Balance Sheet Fundamentals	Corporate Firms Sectors
↓			
Structural Vulnerabilities: Weakened State of Financial System			
↓			
Uncertainty: Investors	Outflow of Capital	⇒ Currency Crisis (Devaluation, Collapse of Currency)	
Certainty: Speculators	Speculative Attacks		
* Inability of Central Banks * Fixed Exchange Rate			
↓			
<b>Asset Markets</b>	Balance Sheet Fundamentals	①Direct effect on the balance sheet of firms ⇒②Further deterioration in balance sheets of the banking sector ③Higher Inflation ⇒Rise in Interest Rate (Fisher Effect)	⇒Demand for Credit ⇒Supply of Credit  Contraction or Slow-down (Credit Crunch or Credit Rationing)  ΔFinancial Position
Structure of Debt Markets (Debt Contracts)	⇒		
<b>Financial Crisis</b> ⇒ ΔAggregate Spending (ΔInvestment, Consumption) in <u>Short-run</u> ⇒ ΔAggregate Supply in the <u>long-run</u> Expectation (Capital Formation ↓; Working Capital ↓)			
<b>Economic Crisis</b> ⇒	Financial Sector (“ <i>financial accelerator</i> ”)	⇒	Goods Market ↓
	Real & Non-financial Sector (Firms, Households)	⇒	Financial & Real Asset Markets Labor Market