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REPUBLIC OF KOREA

Selected Issues

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Approved by the Asia and Pacific Department

January 24, 2002

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I. Features of Korean Business and Export Cycles[1]

In this study we identify and describe some of the key stylized facts of Korean business and export cycles over the period 1960–2001, and calculate a chronology for the classical cycle in these series by applying a variant of the Bry and Boschan (1971) cycle-dating algorithm. We find that (1) the Korean classical business cycle and exports cycles are extremely asymmetric, as they exhibit long-lived expansions and much shorter-lived contractions; (2) the probability of ending a contraction or expansion phase in Korean industrial production and Korean real exports is independent of their duration; (3) there is some support for the view that Korean business cycles are synchronized with U.S. and Japanese business cycles (particularly in the 1990s), but much stronger evidence that Korean exports co-move with fluctuations in economic activity in the U.S. and Japan.

A. Introduction

1. This paper attempts to identify and describe key features of Korean business and export cycles during the period 1960–2001. It will focus on the following questions: What are the key stylized facts of Korean economic cycles? Do expansions and contractions in the level of Korean economic activity have similar features? In particular, are there asymmetries in the duration and amplitude of expansions and contractions? Is there any support for the notion that expansions and contractions in Korean economic activity have a fixed duration? Since previous studies on Korean business cycles emphasize on the role of external demand, the paper will also examine the relationship between Korean business cycles and its exports cycles. In particular, is the Korean business cycle synchronized with fluctuations in the business cycles of its major trading partners, and is the Korean business cycle synchronized with cycles in its real exports?

2. The study of business cycles has a long history in economics. Since the seminal work of Burns and Mitchell (1946) and their colleagues at the National Bureau of Economic Research (NBER), work on cyclical instability has traditionally been concerned with analyzing the attributes of expansions and contractions in the level of economic activity or output (the classical cycle). In examining classical business cycles, contractions (expansions) are described as periods of absolute decline (increase) in a series. An alternative concept to the NBER definition of business cycle fluctuations, spurred by the contribution of Lucas (1977), is that of the growth cycles—fluctuations of economic activity around a long-run trend. As such, growth cycle peaks and troughs are determined on the basis of detrended series.

3. Existing studies of Korean business cycles focus on growth cycle analyses, using different methods of detrending. Kim and Choi (1997) identify three business cycles in the period 1970–91, using data detrended by the HP filter. They find that external factors, such

[1] This paper was prepared by Paul Cashin (RES) and Hong Liang (APD).

as the U.S. output and oil prices, play a significant role in shaping business cycles in Korea. Using a structural VAR approach, Hoffmaister and Roldos (2001), however, find that external shocks explain only a small fraction of the variance of output in Korea. This paper, by contrast, focuses on the concept of level contractions to analyze Korean business cycles for two reasons. First, classical cycles in the level of economic activity often occur at the same time as key macroeconomic shocks (such as asset price collapses and commodity price spikes), and movements in the absolute level of economic activity are typically of greater interest to policymakers than fluctuations in activity relative to its trend. Second, the dating of turning points in classical cycles avoids the need to implement a detrending method (as is required in deriving growth cycles), which are known to often yield distorted estimates of the growth cycle (Canova 1998).

4. The paper is organized as follows. Section B describes the data set. In Section C, using a variant of the Bry and Boschan (1971) cycle-dating algorithm, we provide a chronology for classical cycles in industrial production and real exports in Korea.[2] We then compare and contrast key features of the resultant phases of these cycles. This section also contains a nonparametric analysis of the presence of synchronization between cycles in Korean real exports and Korean industrial production. Section D concludes.

B. Data

5. The quarterly data, for the period 1960:4 to 2001:2, are taken from International Monetary Fund's *International Financial Statistics* (IFS) and *Direction of Trade Statistics* (DTS). All data are in logarithmic form.[3]

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[2] As an alternative measure of economic activity, we also examined classical cycles in real GDP for Korea, Japan and the United States. However, Korea's long period of expansion since the early 1960s yielded only one peak and one trough in real GDP (in the late 1990s), obviating our ability to analyze Korean cycles in GDP. Previous analyses have found that turning points in industrial production are closely related to the NBER's business cycle turning points for the United States (see Artis et al. (1997)).

[3] The seasonally adjusted industrial production indices (for Korea, Japan and the United States) are taken from line 66 of IFS (1995=100). The annualized nominal data on Korean exports (in millions of U.S. dollars) to: the world (country code 001 of DTS); the United States (country code 111 of DTS); the European Union (country code 998 of DTS); and Japan (country code 158 of DTS) have been deflated by the GDP deflator (base 1996) of the United States (taken from the OECD's *Analytical Database*) to form the respective series for real exports. All real export series were then seasonally adjusted using the ratio-to-moving average method of *EViews*.

C. Dating Business Cycles Using Bry-Boschan Methods

6. The duration of phases of business cycles can be determined with the assistance of the Bry-Boschan (1971) algorithm, traditionally used to date turning points in classical cycles. The rules embodied in the Bry-Boschan algorithm have evolved from the NBER's dating of cycles in U.S. economic activity. It attempts to filter out false turning points from noisy data, and as the algorithm is basically a pattern-recognition procedure, the philosophy underlying it is relevant to any time series.[4] This approach does not rule out sequences of activity declines during an expansion, or activity rises during a contraction, but there are constraints on the extent to which these sequences of activity reversals can occur and yet be considered part of any given expansion or contraction.

7. The first step in the algorithm determines the location of potential peaks and troughs. This is done by the application of a turning point rule, which finds points that are higher or lower than an arbitrary window of surrounding points. The rule defines a local peak in series y_t as occurring at time t whenever $\{ y_t > y_{t\pm k} \}$, $k = 1, ..., K$, while a local trough occurs at time t whenever $\{ y_t < y_{t\pm k} \}$, $k = 1, ..., K$. The second step enforces the condition that peaks and troughs must alternate. The third step measures the duration between these points, and a set of censoring rules is then adopted which restrict the minimum length of any phase as well as those of complete cycles. There are further rules designed to avoid spurious cycle dating at the ends of series. When the peaks and troughs in each of the time series have been dated, key features of these cycles can be measured.

Chronology of Business Cycles and Korean Export Cycles

8. The NBER rules for data at monthly frequency generally set K=5, with complete cycles at least 15 months long and all phases at least six months long. In applying these rules to the logarithm of Korean quarterly industrial production data, we follow Harding and Pagan (2002) and set K=2. This ensures that y_t is a local maximum relative to the two quarters on either side of y_t. In determining the minimum time the Korean industrial production series can spend in any phase or cycle, we follow the rule used by Burns and Mitchell (1946) and Harding and Pagan (2002), which requires cycles to be at least five quarters in duration, and phases (industrial production expansions and contractions) must last at least two quarters.[5] Contractions are then described as periods of absolute decline in the Korean industrial production series, not as a period of below-trend growth in the series (see Watson (1994)).

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[4] Harding and Pagan (2001) argue that nonparametric approaches to ascertaining turning points in the business cycle (such as the Bry-Boschan algorithm) compare favorably with that of parametric approaches (such as the Markov switching model), due to the former's greater transparency, simplicity and robustness to variations in the sample selected.

[5] The Appendix sets out the BBQ (Bry-Boschan quarterly) algorithm used to date turning points in the classical cycle.

Classical cycle peaks (troughs) are points when Korean industrial production moves from a positive rate of growth to a negative rate of growth (negative rate of growth to a positive rate of growth).

9. The BBQ algorithm is also used to derive peaks and troughs in U.S. and Japanese industrial production, and in Korean exports to the world, Europe, the U.S. and Japan. The results of the application of the BBQ algorithm can be seen for these series in Figures I.1 to I.7. Clearly, not all the movements in the respective series are identified as peaks and troughs. The cycles are demarcated by peaks and troughs, with periods from peaks to troughs being contractions (shaded areas), and periods from troughs to peaks being expansions (un-shaded areas). For example, Figure I.1 and Table I.1 present the BBQ-algorithm peak and trough dates for Korean industrial production. Briefly, the results indicate that:

- The first trough in Korean industrial production is dated as 1961:3, the second trough is dated as 1980:2, while the first peak is dated as 1979:1—this makes the period 1961:3 to 1979:1 the first expansion phase for Korean industrial production, and the period 1979:1 to 1980:2 the first contraction phase for Korean industrial production.

- Compared with expansions, it is clear that contractions (absolute declines) in Korean industrial production are relatively rare, and short-lived, events.

- In addition, the duration of expansions and contractions in Korean industrial production appears to shorten in the 1990s, following the long-lived expansion of the 1960s and 1970s.

10. Having determined the turning points in the cycles in each series using the BBQ algorithm, several descriptive statistics are presented, summarizing important features of the cyclical properties of each series (Table I.2). The statistics are: the number of completed cycles (dated as the maximum of the number of completed peak-to-peak or trough-to-trough cycles, column 1); the percentage of the sample period during which the series is in a contraction phase (which indicates whether rises and falls are symmetric in duration, column 2); the maximum amplitude (percent change) of contractions in each series, and the dates during which this contraction occurred (which indicates the severity of contractions, columns 3–5); and the maximum amplitude (percent change) of expansions in each series, and the dates during which this expansion occurred (which indicates the severity of expansions, columns 6–8).

11. For Korean industrial production, there were only three completed cycles over the sample period, in contrast with seven completed cycles for Japanese industrial production. For Korean industrial production, only about 10 percent of the sample is spent in a contractionary phase, compared with Korean exports to Japan, which spent over 30 percent of the sample in a contractionary phase. As might be expected, the period during which the greatest contraction in Japanese and U.S. industrial production occurred was at the time of

Figure I.1. Industrial Production, Korea
(Log scale)

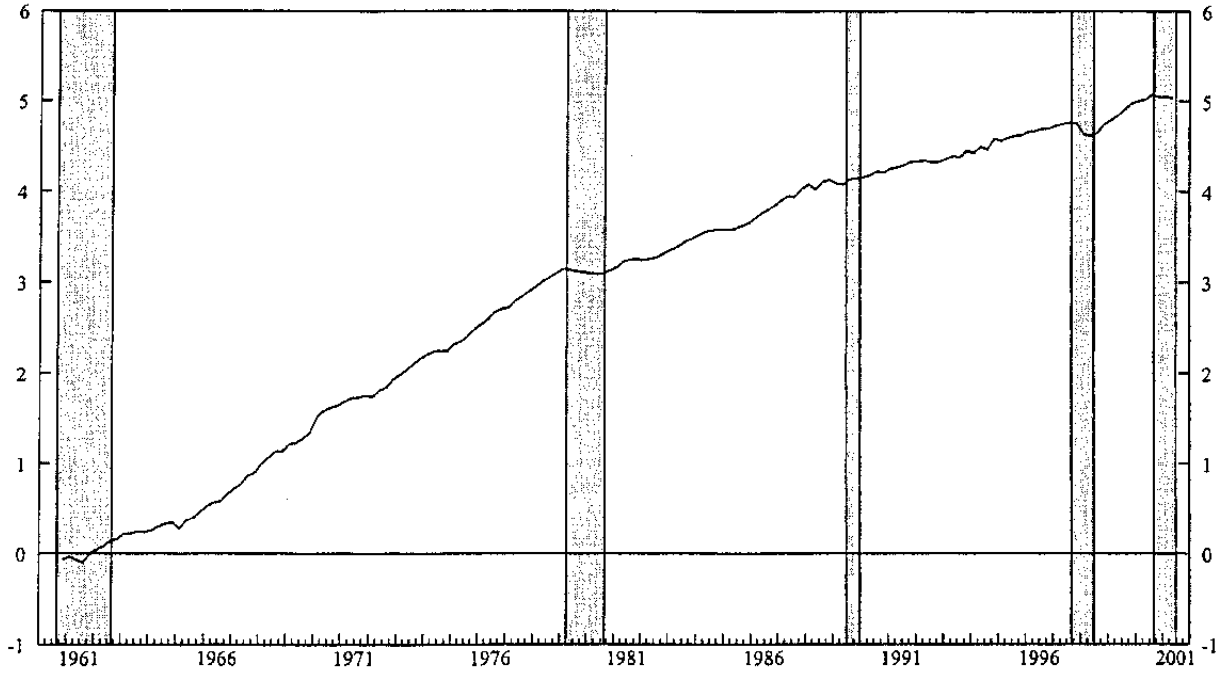

Figure I.2. Industrial Production, Japan
(Log scale)

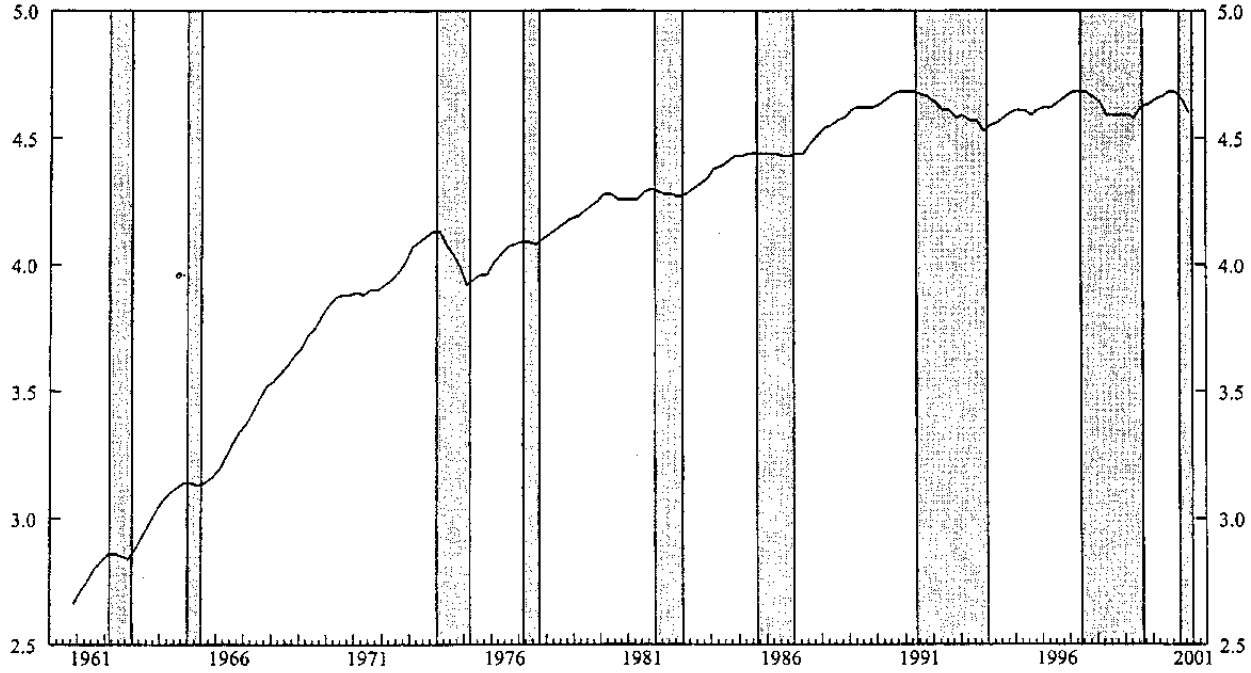

Figure I.3. Industrial Production, the United States
(Log scale)

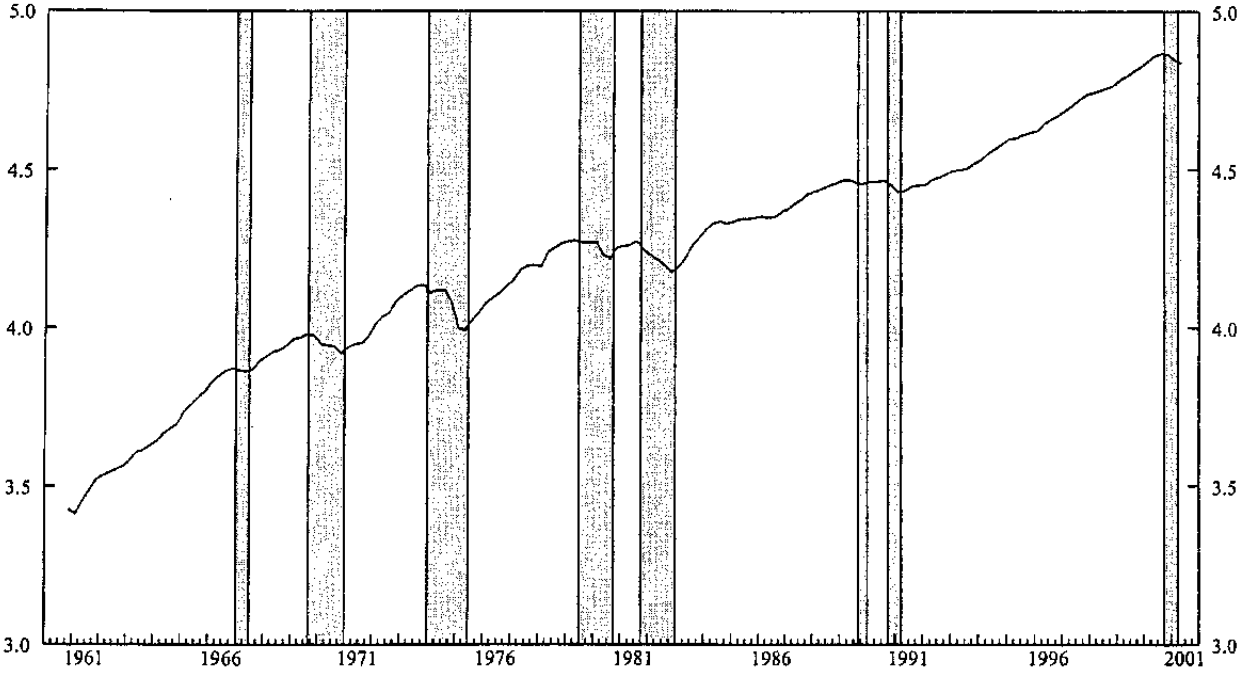

Figure I.4. Real Korean Exports to the World
(1995 US$ in million, log scale)

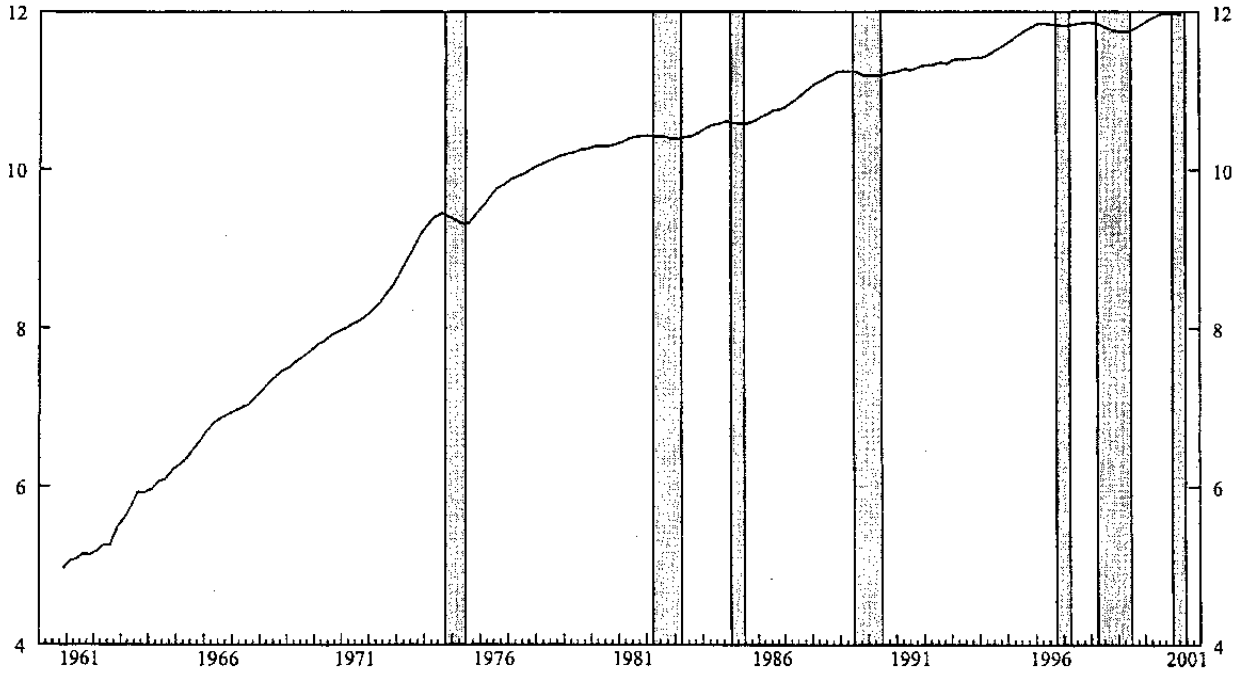

Figure I.5. Real Korean Exports to Europe
(1995 US$ in million, log scale)

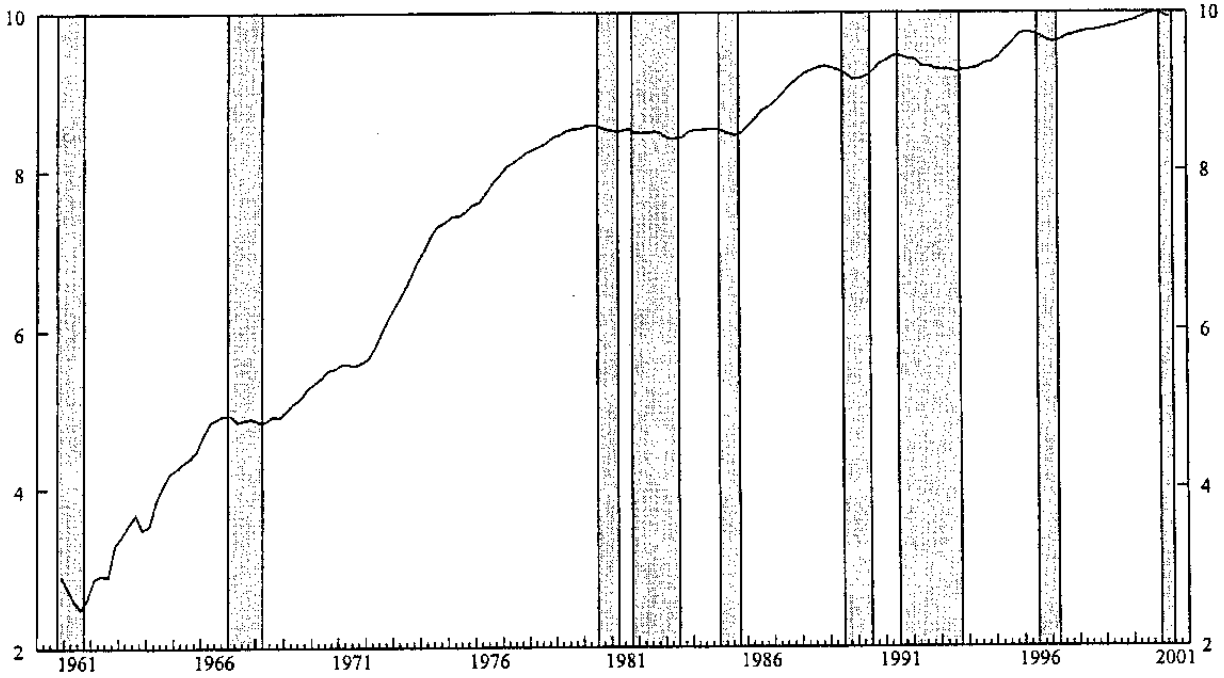

Figure I.6. Real Korean Exports to the United States
(1995 US$ in million, log scale)

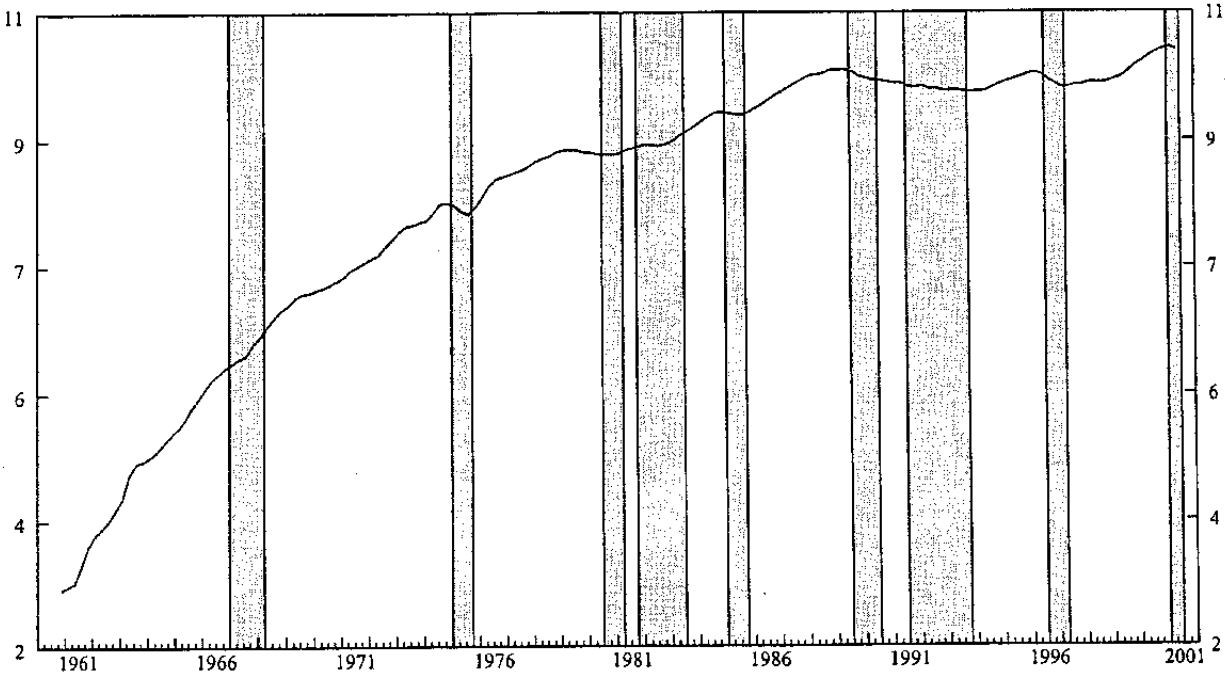

Figure I.7. Real Korean Exports to Japan
(1995 US$ in million, log scale)

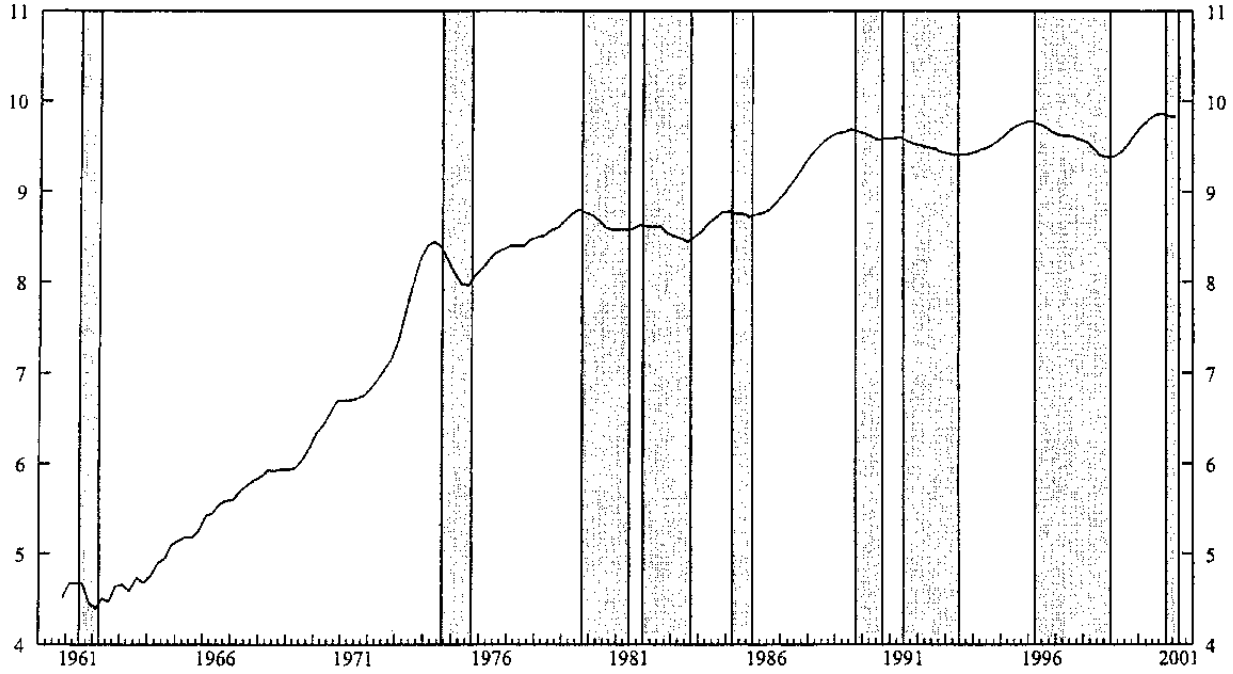

Table I.1. Business Cycle Dates and Durations of Booms and Slumps in Korean Industrial Production and Real World Exports, 1960:4–2001:2

Korean Industrial Production						Korean Real World Exports					
Peak	Trough	Duration		Trough to trough	Peak to peak	Peak	Trough	Duration		Trough to trough	Peak to peak
		Expansion	Contraction					Expansion	Contraction		
	1961:3					1974:3	1975:2		3		
1979:1	1980:2	70	5	75		1982:1	1983:1	27	4	31	30
1988:3	1989:2	34	2	36	38	1984:4	1985:2	7	2	9	11
1997:3	1998:2	33	3	36	36	1989:2	1990:2	16	4	20	18
2000:3		9			12	1996:2	1997:1	24	3	27	28
						1998:1	1999:2	4	5	9	7
						2000:4		6			11
Average		36.50	3.33	49.00	28.67			14.00	3.50	19.20	17.50
Std Dev		25.15	1.53	22.52	14.47			9.86	1.05	10.11	9.61

Notes: For each of two phases (expansion and contraction), three sets of results are presented. These are: the turning points of each phase; the average duration (in quarters) of each phase; and the average duration of each cycle (trough-to-trough or peak-to-peak movement).

Table I.2. Descriptive Statistics of Business Cycle and Export Cycles, 1960:4–2001:2

	Cycles	Time	Max PT	Dates		Max TP	Dates		BS (PT)	BS(TP)
				From	To		From	To		
JAPIP	7	26.9	-18.6	1974:1	1975:2	63.1	1965:3	1974:1	0.69	1.10
KORIP	3	10.4	-13.1	1997:4	1998:2	96.1	1961:4	1979:2	0.15	-0.08
USAIP	6	18.4	-13.3	1974:1	1975:3	35.4	1991:2	2000:4	-0.10	0.67
KEURX	7	25.2	-18.9	1991:3	1993:4	97.6	1968:2	1980:3	0.98	1.10
KWORX	5	14.1	-12.4	1974:4	1975:3	67.5	1975:3	1982:2	-0.75	0.21
KUSAX	5	23.3	-27.2	1989:2	1994:1	60.1	1975:4	1979:3	1.60	-0.68
KJAPX	7	30.7	-38.2	1974:3	1975:4	98.3	1962:2	1974:3	0.38	1.59

Source: Authors' calculations.

Notes: The series analyzed are: Japanese industrial production (JAPIP); Korean industrial production (KORIP); United States industrial production (USAIP); Korean real exports to Europe (KEURX); Korean real exports to the world (KWORX); Korean real exports to United States (KUSAX); and Korean real exports to Japan (KJAPX). Cycles denotes the number of completed cycles (the maximum of the number of peak-to-peak or trough-to-trough cycles completed). Time denotes the percentage of total time spent in a slump (contraction) phase of the cycle. Max PT is the maximum amplitude of all contractions (peak-to-trough (PT) movements), and the dates of this maximum. Max TP is the maximum amplitude of all expansions (trough-to-peak (TP) movements), and the dates of this maximum. BS(PT) and BS(TP) denote the value of the Brain-Shapiro (1983) statistic for duration dependence in contractions and expansions, respectively. The null hypothesis of the Brain-Shapiro statistic is that the probability of terminating a phase (expansion or contraction) is independent of the length of time a series has been in that phase. An asterisk denotes that the null hypothesis is rejected (using a 5 (10) percent critical value for a two-tailed test)—any result greater than the (absolute) critical value of 1.96 (1.65) indicates duration dependence in the series

the first oil shock (between 1974:1 and 1975:3), while for Korean industrial production the greatest contraction (a fall of 13 percent) occurred at the time of the Asian economic crisis (between 1997:4 and 1998:2).

12. In addition to information on the attributes of the cycles, the salient features of movements in each series between these turning points are also reported (Table I.3). For each of the series, the table splits the data into two phases—contractions and expansions. For each phase, results are presented for: the average duration (in quarters) of the phase; the average amplitude of the aggregate phase movement (in percent change); and the average quarterly amplitude (amplitude divided by the duration).

13. The results reveal an interesting stylized fact of classical business and export cycles: they are asymmetric, with contractions being much shorter in duration than expansions.

- This duration asymmetry is most stark in the case of Korean industrial production, where average expansions last about 12 times as long as average contractions. Korea stands out as having extremely long expansions and rather short contractions, with the average business cycle in Korea lasting about 40 quarters, which is about twice as long as business cycles in Japan and the United States.

- For all series, there is also an asymmetry in the relative amplitude of expansions and contractions—the average rise in the series during expansions is much greater than the average fall in the series during contractions. Contractions typically reduce Korean industrial production by about 8 percent, while expansions typically increase industrial production by about 62 percent. In addition, Korean exports to the United States rise on average by about three times the magnitude that they decline during contractions (about 36 percent versus 12 percent).

- Strikingly, in spite of the strong asymmetry present in phase durations and amplitudes, the speed (per quarter amplitude) of rises in each series during expansions and the speed of falls in each series during contractions is much more symmetric. For example, real Korean world exports typically decline (rise) in a contraction (an expansion) by about 1.9 percent (2.5 percent) per quarter.[6]

[6] The results for the duration of expansions, contractions and completed business cycles (for Japan and the U.S.) in Table I.2 are close to those obtained by Artis et al. (1997) using monthly industrial production data and an adaptation of the Bry-Boschan cycle-dating algorithm.

Table I.3. Descriptive Statistics of Contractions and Expansions in Korean, Japanese and United States Industrial Production and Korean Real Exports, 1960:4–2001:2

Series	Contractions			Expansions		
	Duration	Amplitude	Quarterly Amplitude	Duration	Amplitude	Quarterly Amplitude
Korea IP	3.33	-7.92	-2.69	36.50	61.80	2.22
Japan IP	5.25	-6.14	-1.02	14.13	23.06	1.70
United States IP	3.86	-5.65	-1.31	15.43	17.43	1.13
Korean:						
World Exports	3.50	-6.58	-1.90	14.00	34.97	2.50
Europe Exports	5.00	-11.55	-2.46	15.25	44.72	3.08
U.S. Exports	6.33	-12.04	-2.19	10.40	36.32	3.37
Japan Exports	6.00	-20.87	-3.87	13.75	40.32	3.19

Notes: For each of two phases (expansions and contractions), and for each of exports and industrial production (IP) series, three results are presented. First, the average duration (in quarters) of each phase. Second, the average amplitude of the aggregate phase movement in each of the series (in percent change). Third, the average amplitude per quarter (amplitude divided by the duration).

Do Business Cycles and Korean Export Cycles Have a Fixed Duration?

14. Using more formal nonparametric tests, the nature of the expansionary and contractionary phases in Korean real exports and industrial production are examined. Specifically, the Brain-Shapiro (1983) test of duration dependence is used to investigate whether there is any tendency for expansions and contractions in these economic series to maintain a fixed duration. If true, this would imply duration dependence—the longer any expansion or contraction continues, the more likely it is to switch to the other phase.

15. Accordingly, following Diebold and Rudebusch (1990), the Brain-Shapiro statistic for duration dependence is calculated to test whether the probability of ending an expansion or contraction is dependent on how long the series has been in that expansion or contraction. The null hypothesis of the Brain-Shapiro statistic is that the probability of exiting a phase is independent of the length of time a series has been in that phase. The two possible alternatives are that either: (i) the longer an expansion or contraction persists, the greater the likelihood that the expansion or contraction will terminate (positive duration dependence); or (ii) the longer an expansion or contraction persists, the greater the likelihood that the expansion or contraction will be self-perpetuating, and hence the lower the likelihood that the expansion or contraction will terminate (negative duration dependence). The distribution of the Brain-Shapiro statistic is asymptotically $N(0,1)$, which it quickly approaches normal even in small samples.[7] The results of the Brain-Shapiro test, reported in Table I.1, indicate that:

- For all three countries, the probability of an expansion or contraction in industrial production ending was found to be independent of its duration. Similarly, the termination probability of a contraction (expansion) in Korean real exports did not change the longer the contraction (expansion) lasted.

- While not statistically significant, the negative duration dependence in contraction phases of Korean exports to the United States (given the positive Brain-Shapiro statistic) provides some weak evidence that the longer such export contractions continued, the lower was the probability of switching to an expansionary phase. Similarly, the negative duration dependence in expansion phases of Korean exports to Japan (given the positive Brain-Shapiro statistic) provides some weak evidence that the longer such export expansions continued, the lower was the probability of switching to a contractionary phase.

[7] A negative (positive) Brain-Shapiro statistic is associated with positive (negative) duration dependence (Diebold and Rudebusch, 1990).

Is There Synchronization Between Business Cycles and Korean Export Cycles?

16. The previous sub-section examined the salient features of the cyclical behavior of Korean real exports and Korean, Japanese and U.S. industrial production. This subsection complements this by analyzing other changes in the strength of the link between these series. In particular, the presence or absence of synchronization between cycles in two series is investigated. In doing so, the Burns and Mitchell (1946) approach is followed in describing synchronized cycles as those where there is a clustering of turning points in the two series. For example, two cycles would be described as perfectly synchronized if their peaks and troughs occur at the same points in time. To further examine the synchronous nature of the relationship between the series, two measures of comovement are used: the correlation between industrial production and Korean real exports, and a measure of the concordance between industrial production and Korean real exports.

Concepts of Synchronization: Correlation and Concordance

17. Concordance is measured by a non-parametric statistic that describes the proportion of time two series (x_i and x_j) are in the same phase, awarding one when both series are expanding or contracting together, and awarding a zero otherwise. Following Harding and Pagan (2002), let $S_{i,t}$ be a binary random variable taking the value unity when a series x_i (say, industrial production) is in an expansion state, and zero when it is in a contraction state; and let $S_{j,t}$ be a binary random variable taking the value unity when a series x_j (say, real exports) is in an expansion state, and zero when it is in a contraction state. The index of concordance is then

$$C_{ij} = T^{-1}\left\{\sum_{t=1}^{T}\left(S_{i,t}\cdot S_{j,t}\right)+\sum_{t=1}^{T}\left(1-S_{i,t}\right)\left(1-S_{j,t}\right)\right\}, \qquad \text{(I.1)}$$

where: $S_{i,t}$ and $S_{j,t}$ are as defined above, and T is the sample size. To interpret C_{ij}, a value of 0.66 for the statistic indicates that 66 percent of the time, x_i and x_j are in the same phase (that is, both expanding or contracting together). As it is a proportion, the values of C_{ij} are clearly bounded between zero and one.[8] [9]

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[8] The series x_i is exactly pro-cyclical (counter-cyclical) with x_j if $C_{ij}=1$ ($C_{ij}=0$). The index of concordance was introduced by Harding and Pagan (2002), and has previously been applied to analyze co-movement in industrial country business cycles by McDermott and Scott (2000).

[9] Faced with a realized concordance index of, for example, 0.7, it is natural to assume that this is large relative to zero. However, even for two unrelated series the expected value of the concordance index may be 0.5 or higher. For example, consider the case of two fair coins being tossed. The probability that both coins are in the same phase—that is, both heads or both tails—is 0.5.

18. A disadvantage of C_{ij} is that it does not provide a means of determining if the extent of co-movement (or synchronization) between cycles in the two series is statistically significant. To do so, a concordance test statistic is needed. If the expected value of C_{ij} is evaluated under the assumption of mean independence, then, following Harding and Pagan (2002), the *t*-statistics examining the null hypothesis of no concordance between the two series can be computed from the regression coefficient estimate attached to $S_{i,t}$ in the regression of $S_{j,t}$ against a constant term and $S_{i,t}$. In addition, given that the errors from such a regression are unlikely to be *i.i.d.*, due to the strong likelihood of serial correlation or heteroscedasticity in $S_{i,t}$, the *t*-ratio for the regression coefficient will need to be made robust to higher-order serial correlation and heteroscedasticity.

19. In measuring concordance, the focus is on whether two series move together in any given period. That is, the interest is in *periodicity*—the proportion of time two series spend together in expansions or contractions—and not in the amplitude of movements in a given phase (expansion or contraction).[10] Correlation, on the other hand, is based on covariance, which picks up amplitude (shifts in the level of series) as well as periodicity. It is possible for a large, one-time shift in the level of two series (for example, those induced by the oil shock of 1974) to induce significant correlation in otherwise unrelated series. In contrast, such a shock will only be important under the concordance test to the extent that the co-movement lasts for a lengthy period of time.[11]

Synchronization Results

20. Table I.4 presents the correlation statistics for the first differences of the industrial production and Korean real exports series. For the full sample period, significant correlations (at the 5 percent level) are found for all but three of the 21 combinations. In particular, there is a strong positive association between all four destinations for Korean exports and Korean industrial production (Table I.4). For the decade of the 1990s, there is much weaker evidence of pairwise association, with only nine of the 21 combinations being statistically significant

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[10] Concordance is also a useful concept of co-movement because it represents a way to summarize information on the clustering of turning points—that is, whether expansions (contractions) in different series turn into contractions (expansions) at the same time.

[11] To illustrate, McDermott and Scott (2000) consider an example with two independent random walks of 100 observations each, with variances chosen so as to generate series that look like "typical" economic time series. A jump point is added halfway through both series. As expected, the concordance statistic measures 0.5. However, the correlation of the first-differenced series is large and significant, even though the two series are otherwise random. This result reflects the fact that correlation, as scaled covariance, mixes the concepts of duration and amplitude into one measure. The correlation statistic is therefore not easily interpreted—a high number may be the result of significant co-movement through time, or, as here, the result of a single large event that is common to the two series.

Table I.4. Correlation Statistics, First Differences, 1961:1–2001:2

	JAPIP	KORIP	USAIP	KEURX	KWORX	KUSAX	KJAPX
JAPIP	1						
KORIP	**0.189**	1					
USAIP	**0.375**	0.070	1				
KEURX	0.101	**0.256**	*0.131*	1			
KWORX	**0.434**	**0.249**	**0.289**	**0.636**	1		
KUSAX	**0.405**	**0.216**	**0.383**	**0.435**	**0.649**	1	
KJAPX	**0.390**	**0.237**	**0.156**	**0.432**	**0.743**	**0.230**	1

Table I.5. Correlation Statistics, First Differences, 1990:1–2001:2

	JAPIP	KORIP	USAIP	KEURX	KWORX	KUSAX	KJAPX
JAPIP	1						
KORIP	0.235	1					
USAIP	0.235	0.209	1				
KEURX	**0.328**	0.042	-0.071	1			
KWORX	**0.367**	0.127	0.108	**0.564**	1		
KUSAX	0.217	0.146	0.135	**0.526**	**0.601**	1	
KJAPX	**0.388**	*0.263*	0.169	**0.490**	**0.731**	**0.742**	1

Source: Authors' calculations.

Notes: The series analyzed are: Japanese industrial production (JAPIP); Korean industrial production (KORIP); United States industrial production (USAIP); Korean real exports to Europe (KEURX); Korean real exports to the world (KWORX); Korean real exports to United States (KUSAX); and Korean real exports to Japan (KJAPX). All series are in first differences. The critical values for significant correlations are calculated as $1.96/T^{1/2}$ (for 5 percent) and $1.65/T^{1/2}$ (for 10 percent), where T is the number of observations. Accordingly, for Table I.4 with T=162, individual cross-correlations exceeding 0.154 (0.130) will be significant at the 5 (10) percent level. For Table I.5 with T=46, individual cross-correlations exceeding 0.289 (0.243) will be significant at the 5 (10) percent level. The bolded (italicized) cell indicates significance at the 5 (10) percent level

at the 5 percent level. While Korean exports remain positively correlated with Japanese industrial production in the 1990s, there is weak evidence of an association of Korean exports to Japan with Korean industrial production (Table I.5).

21. We contrast the correlation findings with our analysis of pairwise synchronization using the concordance statistic, for the full sample period (1960:4 to 2001:2). The index of concordance reveals that:

- While industrial production in the United States and Japan moved in the same direction almost 80 percent of the time, the null hypothesis of no concordance between these two series could not be rejected (Table I.6).

- Japanese industrial production and Korean exports to Japan were strongly synchronized, as were U.S. industrial production and Korean exports to the United States, with both pairs of series moving in the same direction about 74 percent of the time.

- In addition, the null hypothesis of no concordance between Korean world exports and U.S. industrial production is rejected, as is the null of no concordance between Korean world exports and Japanese industrial production.

- Finally, as with the correlation analysis, cycles in the various destinations for Korean exports were highly synchronized with one another.

22. A similar pattern emerges when examining the concordance results for the decade of the 1990s (Table I.7):

- While Korean exports to the United States and Korean industrial production became mildly countercyclical (moving together only 41 percent of the time), cycles in Korean and Japanese industrial production and in U.S. and Korean industrial production became synchronized. In particular, during the 1990s Korean and U.S. industrial production, and Korean and Japanese industrial production, moved together 89 percent and 61 percent of the time, respectively. Such an association is indicative of greater linkages between Korean economic activity and the world economy.

- However, there continued to be little evidence of synchronization between cycles in Japanese and U.S. industrial production, with the two series moving in the same direction only 50 percent of the time (about the same proportion as a toss of two fair coins landing on the same side).

- Finally, there continued to be strong evidence of synchronization between cycles in Japanese industrial production and Korean exports to Japan, with both series moving in the same direction about 74 percent of the time.

Table I.6. Concordance Statistics, 1960:4–2001:2

	JAPIP	KORIP	USAIP	KEURX	KWORX	KUSAX	KJAPX
JAPIP	1.00						
KORIP	0.687 [0.16]	1.00					
USAIP	0.681 [0.77]	0.798 [1.22]	1.00				
KEURX	0.675 [1.16]	0.742 [1.15]	0.712 [1.29]	1.00			
KWORX	*0.736 [1.78]*	0.791 [0.34]	**0.798 [2.02]**	**0.767 [2.24]**	1.00		
KUSAX	0.693 [1.36]	0.724 [0.39]	*0.742 [1.82]*	**0.798 [3.74]**	**0.785 [2.27]**	1.00	
KJAPX	**0.742 [3.12]**	0.699 [1.51]	0.693 [1.62]	**0.773 [3.64]**	**0.785 [3.88]**	**0.816 [5.07]**	1.00

Table I.7. Concordance Statistics, 1990:1–2001:2

	JAPIP	KORIP	USAIP	KEURX	KWORX	KUSAX	KJAPX
JAPIP	1.00						
KORIP	**0.609 [2.43]**	1.00					
USAIP	0.500 [0.31]	*0.891 [1.65]*	1.00				
KEURX	0.674 [1.52]	0.630 [0.03]	0.652 [0.29]	1.00			
KWORX	0.565 [0.53]	0.739 [1.15]	0.717 [0.53]	0.630 [0.48]	1.00		
KUSAX	0.587 [0.70]	**0.413 [1.92]**	0.522 [0.20]	**0.783 [2.98]**	0.500 [0.22]	1.00	
KJAPX	**0.739 [2.88]**	0.565 [1.52]	0.457 [0.49]	**0.761 [3.15]**	**0.652 [2.28]**	**0.717 [2.35]**	1.00

Source: Authors' calculations.

Notes: The series analyzed are: Japanese industrial production (JAPIP); Korean industrial production (KORIP); United States industrial production (USAIP); Korean real exports to Europe (KEURX); Korean real exports to the world (KWORX); Korean real exports to United States (KUSAX); and Korean real exports to Japan (KJAPX). Concordance measures the extent to which the cycles in two series are synchronized, and is the proportion of time that the two series are concurrently in the same phase (that is, concurrently in a boom (expansion) period or concurrently in a slump (contraction) period). The i, j^{th} cell represents concordance between the i^{th} and j^{th} series; the numbers along the diagonal are therefore unity. Following Harding and Pagan (2001), the t-statistics (in square brackets) were computed from the regression of $S_{j,t} = a + bS_{i,t} + u_t$, where: a is a constant term, u_t is the error term, $S_{i,t}$ is a series taking the value unity when the i^{th} series is in an expansionary phase and zero when the i^{th} series is in a contractionary phase, and $S_{j,t}$ is a series similarly defined for the j^{th} series. The t-statistic tests the null hypothesis of no synchronization (that is, H_0: b=0 in the above regression) between series $S_{i,t}$ and series $S_{j,t}$, and the t-statistics were computed using the Newey-West heteroskedastic autocorrelated consistent standard errors. The bolded (italicized) cell indicates significance at the 5 (10) percent level.

D. Conclusion

23. In this study we have examined some of the key stylized facts of Korean business and export cycles over the period 1960–2001, and calculated a chronology for the classical business cycle. We have several notable findings. First, the Korean classical business cycle and export cycles are very asymmetric, as they exhibit long-lived expansions and much shorter-lived contractions, with much greater amplitude of movement in expansions than contractions. Second, the probability of ending a contraction or expansion in Korean industrial production is independent of its duration; similarly, there was little evidence that the phases of the Korean real export cycle maintained a fixed duration. Third, while there is only weak support for the view that Korean business cycles are synchronized with U.S. and Japanese business cycles (especially prior to the 1990s), our results indicate that Korean exports are synchronized with fluctuations in economic activity in the U.S. and Japan.

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Dating of Business Cycles and Korean Export Cycles Using the Bry and Boschan (BBQ) Algorithm

In constructing the BBQ algorithm to determine the turning points (peaks and troughs) in quarterly industrial production and Korean export data, the original Bry and Boschan (1971) business cycle-dating algorithm has been adapted as follows.

Step 1: Make First Pass at Dating Peaks and Troughs

The algorithm picks an initial selection of peaks and troughs, where a peak is located at the highest point in the series using a window two quarters either side of that point, and vice versa for troughs.

Step 2: Enforce Alternation of Peaks and Troughs

The algorithm checks that none of the peak dates and trough dates are shared.

Step 3: Censor Dates

(i) The algorithm enforces the restriction that cycles (peak-to-peak and trough-to-trough) are at least five quarters long.

(ii) The algorithm censors the dates at the end of the series by eliminating turns within two quarters of both ends of the series, and by eliminating peaks (troughs) at both ends which are lower (higher) than values closer to the end.

(iii) The algorithm again checks the restriction that cycles (peak-to-peak and trough-to-trough) are at least five quarters long.

(iv) The algorithm eliminates phases whose duration is less than two quarters long.

Step 4: Statement of Final Turning Points

The algorithm selects the final peak and trough dates.

II. Labor Market Developments in Korea Since the Crisis[1]

The adjustment to the economic crisis involved major changes in the labor market, including the end of lifetime employment, increased reliance on nonregular (i.e., temporary and daily) workers, increased flexibility of compensation through performance-based schemes, and higher participation and employment of women. These changes have made Korea's labor market more flexible. However, continuing rigidities may be inducing an excessively high level of nonregular employment, with negative implications for productivity and equity.

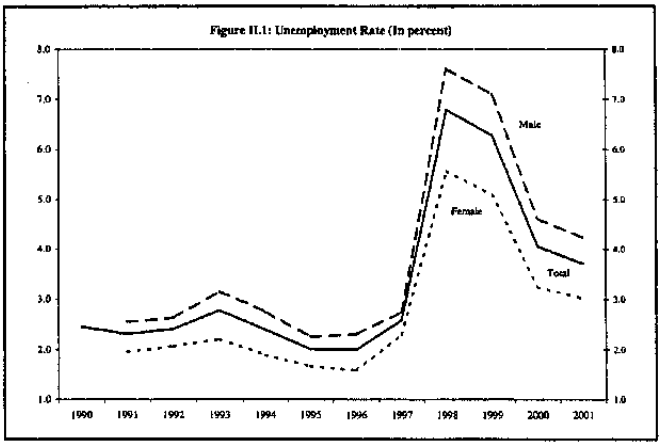
A. Introduction

1. The economic crisis in 1997–98 led to changes not only in the areas of macroeconomic policies, corporate governance, and financial structures, but also to policy reforms in the labor market and adjustments by employers and employees. Most visibly, the crisis put an end to lifetime employment, which had been made possible by the previous era of sustained fast economic growth and tight labor markets. Other important changes in the labor markets included: increased reliance on nonregular employment, increased flexibility of employment compensation, and higher participation and employment of women.

2. This paper is organized as follows. Section B briefly reviews the immediate impact of the financial crisis on unemployment and various policy responses. Section C discusses labor market adjustments since the crisis.[2] The last section points out some remaining areas to be addressed to further improve the functioning of the labor market in Korea.

B. Immediate Impact of the Crisis and Policy Responses

3. The Korean labor market showed significant flexibility in response to the crisis, both in terms of prices and quantity. The immediate impact of the crisis on the labor market was a sharp rise in unemployment. The unemployment rate rose from 2.6 percent at the onset of the crisis in November 1997 to peak at about 8½ percent in February 1999.[3] This was a severe shock to the labor market, considering that, from the 1980s to the

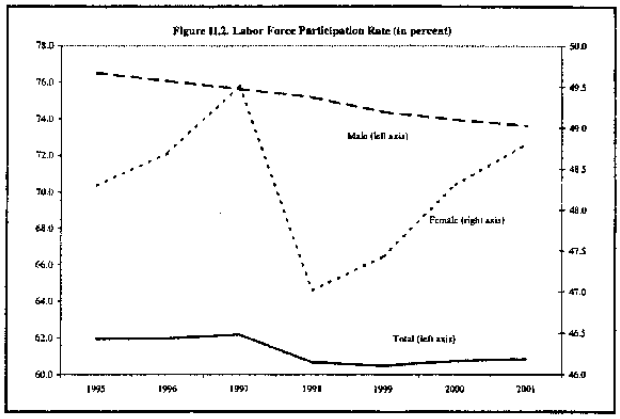


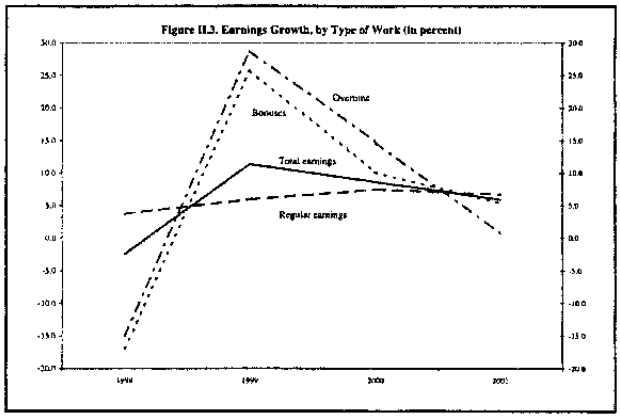
[1] This paper was prepared by Hong Liang and Henry Ma (both APD).

[2] A survey of labor market developments since the crisis is also provided in Kim (2001).

[3] In Korea, those who have looked for work during the previous one week are counted as unemployed, while the ILO and OECD definitions include those who have looked for work in the preceding two weeks and four weeks, respectively. Hence, measured unemployment would be higher in Korea if the ILO or OECD definitions are used.

mid-1990s, the annual average unemployment rate never exceeded 4 percent and was typically in the region of 2–3 percent. Unlike the past, when unemployment was concentrated among young people, this time unemployment among those aged 30–50 rose substantially. Unemployment would have been even higher if labor force participation had not decreased, mainly due to the postponement of job search by younger workers and withdrawal by female workers.





4. Earnings adjusted flexibly to lower labor demand. Average monthly earnings fell by 2½ percent in 1998, or by 9 percent in real terms. As the OECD (2000) notes, pay cuts are rare in OECD countries, even during crisis situations. The brunt of the adjustment in Korea was borne by overtime and bonuses, which fell by 15 percent and 17 percent, respectively.[4] In contrast, regular salaries rose by about 3¾ percent. Wages responded very flexibly due to the decentralized nature of wage bargaining in Korea. Compensation is determined on an annual basis at the enterprise level; hence, outcomes reflect primarily firm-specific factors. Further, the statutory minimum wage has little impact, having fallen to less than 25 percent of the average manufacturing wage (OECD, 2000).

5. The initial policy response to the rise in unemployment included the expansion of the social safety net. Measures adopted included:

- temporary wage subsidies to firms that retained redundant workers, and further assistance through vocational training and job placement;

- an expansion of the coverage of the employment insurance system (EIS) in 1998, first to include all enterprises with five or more employees, and later, to cover all enterprises;[5]

- given the limited coverage of EIS at the beginning of the crisis, public works programs were also initiated and employed about ½ million people in 1998 and ¾ million in 1999.

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[4] These components account for about a third of total compensation.

[5] As a result, the proportion of wage workers covered by EIS rose from 33 percent to 70 percent. Daily workers and part-time employees working less than 80 hours a month remain ineligible.

With the implementation in 2000 of the National Basic Livelihood Security Law, a comprehensive institutional framework for welfare provision was put in place.

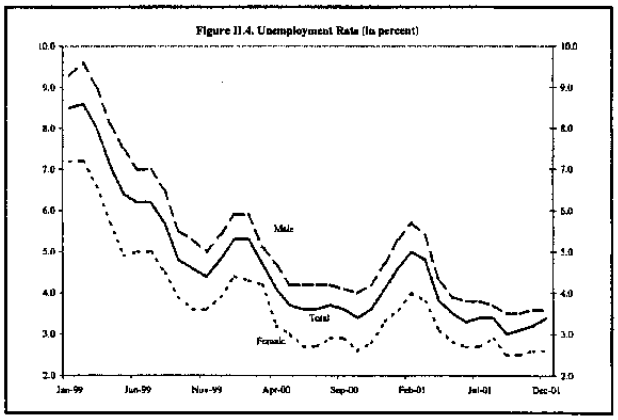
6. For longer-term restructuring, the Tripartite Commission was formed in January 1998 to forge agreements on layoffs, pay cuts, and reductions in overtime and bonuses. Under the auspices of the Commission, two major changes were enacted to the labor laws in 1998:

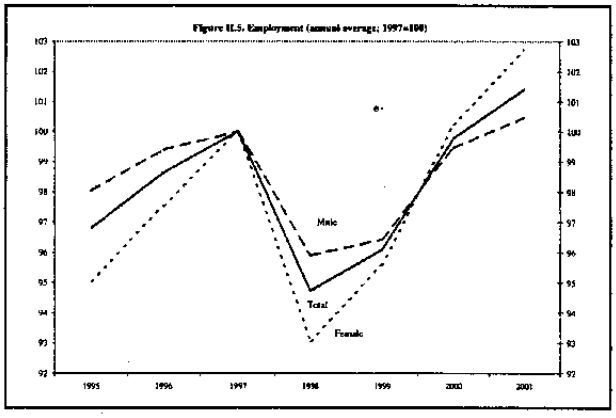
- Dismissal of employees was made easier, by allowing layoffs of redundant workers in cases of "urgent material need," including mergers and acquisitions.
- Temporary work was legalized, and temporary employment agencies were allowed to operate.

These changes signaled that employment security could no longer be taken for granted, and opened the way for new forms of employment arrangements. Although firms that were downsizing resorted mainly to "honorable" retirement, spinoffs, early retirement, and attrition, rather than outright dismissal (Park, Duck Jay, et al, 2001), the change of laws that made dismissal easier likely facilitated the process of employment adjustment.

C. Labor Market Adjustments Since the Crisis

7. As the economy recovered, unemployment dropped briskly. By December 1999, unemployment had halved from its peak in February 1999. Since then, it has continued to fall steadily, and stood at 3¼ percent (714,000 individuals) by end-2001. The improvement has to some extent been due to "discouraged workers" dropping out of the labor market, as the labor force participation rate has fallen, from about 63 percent in 1996 to 61 percent by end-2001. Thus, in absolute numbers, employment has grown by only about 1¼ percent (or about 250,000 jobs) since 1997.[6]

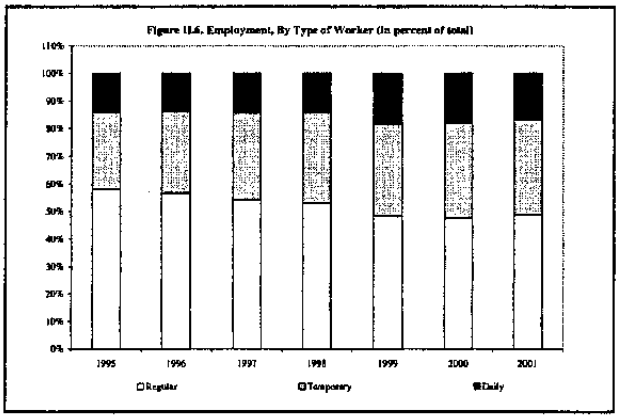




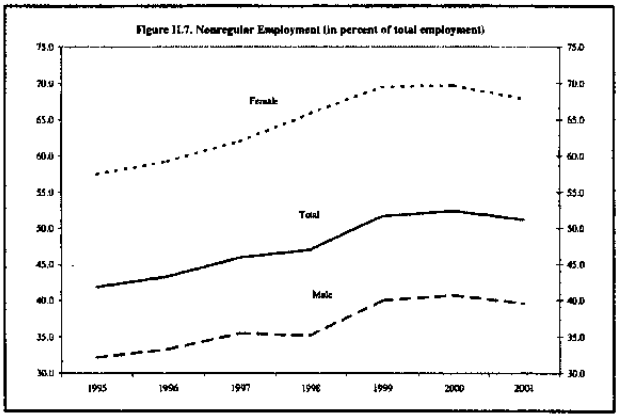
8. Flexible compensation schemes have grown. The pickup in labor demand was accompanied by improved earnings, which grew by 11 percent in 1999. Strikingly, however, regular pay grew by only 6 percent, while overtime and bonuses both grew by

[6] If the labor force participation rate had stayed at 62 percent (the average for 1995–97), unemployment would have peaked at 14¾ percent in February 1999 (instead of 8½ percent), and would have been about 4 percent in end-2001.

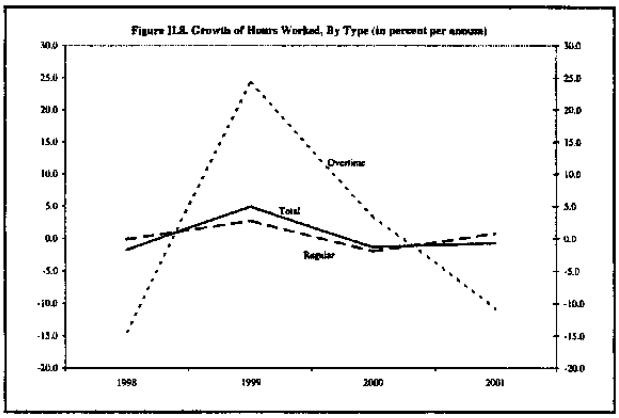
more than 25 percent (see Figure II.3). The same pattern continued in 2000 and 2001, with the flexible component of monthly earnings growing faster than regular pay. Evidently, employers have remained cautious, increasing compensation through means that could be easily reversed if business conditions were to worsen. Thus, in 2001, as the economy slowed, overtime pay grew by only ½ percent, keeping overall earnings growth down to 7 percent, about the same as in 2000.



9. The share of temporary and daily workers in total employment, which was already high by OECD standards, has increased further. In fact, most employment gains have been in temporary and daily work. Between 1997 and 2001, the number of regular workers fell by 9 percent.[7] By contrast, the number of temporary and daily workers grew by 9½ percent and 17 percent, respectively. Consequently, the share of temporary workers rose from 32 percent to 34 percent of the workforce; and daily workers from 14 percent to 17 percent (Figure II.6). Thus, more than half of all employees now hold "nonregular" jobs, and Korea now has the highest share of nonregular jobs among OECD countries. Nonregular workers are highly concentrated among women, older workers, and the less-educated (Figure II.7).

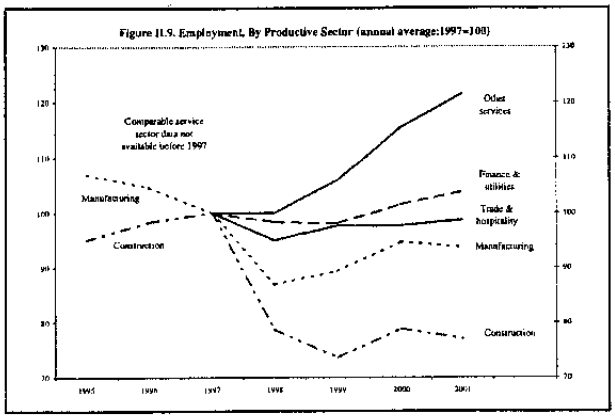


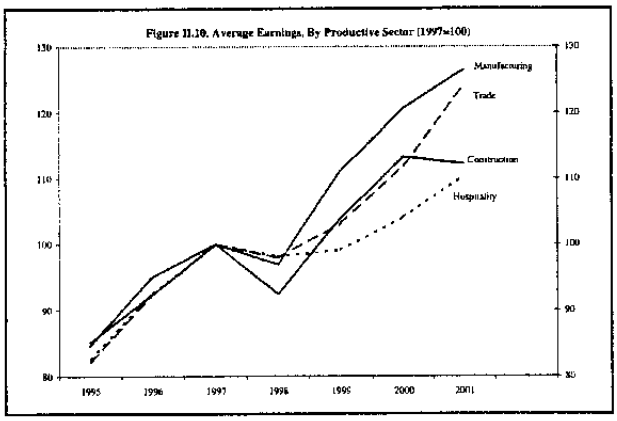
10. The growth of nonregular employment is also reflected in the significant variations in working hours (Figure II.8). The number of regular hours has not changed much but overtime has been highly variable. Evidently, firms have been eliciting increased overtime instead of hiring more workers. Thus, labor costs would not be ratcheted up during an upturn and could be easily reduced during a downturn.



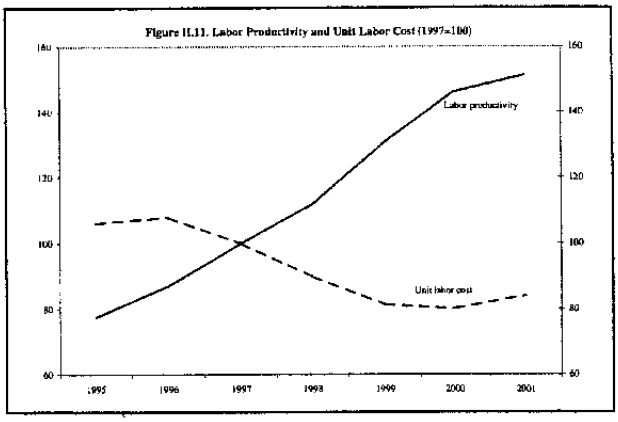
[7] Regular workers are those who work more than one year at a firm and are paid standard wages, plus bonuses and overtime. Nonregular workers are those who work for a set period of time, which can be extended or terminated at the discretion of the employer.

11. The shift to the service sector has accelerated. The shift to services in terms of both output and employment has been going on since the 1980s, and in this respect, Korea is becoming more like other OECD countries. Services now account for the bulk of employment. Between 1997 and 2001, the share of manufacturing employment fell from 23 percent to 19½ percent, while the share of services rose from 66 percent to 70 percent. In 2001, the strong demand for labor in the service sector, which tends to be more labor-intensive than manufacturing, helped keep unemployment low despite the economic downturn. Further, earnings growth has been slower in the service sector due to the fragmentation and small size of firms and the relative weakness of trade unions. Between 1997 and 2001, overall earnings grew by 5 percent, which comprised earnings growth of 6 percent in manufacturing and 3½ percent in services.





12. Labor productivity growth has been robust. Although productivity growth slowed in 2001 in connection with the downturn, over the longer period 1997–2001, the annual growth of labor productivity has averaged 13 percent. With wages having grown modestly, unit labor costs fell by an average of 5 percent per annum.



13. The role of women in the labor force has grown.[8] Female labor force participation fell during the crisis, but has regained its previous level (see Figure II.2). The unemployment rate for women has always been below the rate for men, but the gap has widened (see Figure II.1). Consequently, the proportion of women in the work force has risen by about 2 percentage points. This increase, however, has taken the form of more women being hired as temporary and daily workers (see Figure II.7). Thus, among regular workers, the proportion of women has fallen by 3 percentage points since 1997. By contrast, among temporary and daily workers, the ratios have risen by 1 percentage point and 3 percentage points, respectively.

[8] Also see Choi, et al., 2001, "Mobilizing South Korea's Women."

14. Unionization has fallen. The onset of the crisis fostered closer cooperation between unions and employers under the auspices of the Tripartite Commission, due to the realization that the severe downturn required joint efforts. As the economy recovered in 1999, the number of labor disputes and days lost also rose. However, the percentage of workforce that is unionized has fallen from about 14 percent at the beginning of 1990s to about 12 percent after the crisis, and is concentrated in the larger firms and those in manufacturing. The unionization rate in Korea is now well below the OECD average of 40 percent.

Indicators of industrial relations

	Labor disputes			Unionization	
	No. of cases	Workers (in thousands)	Days lost (in thousands)	Members (in thousands)	Rate (in %)
1990-96	176	108	1,909	1,709	14.3
1997	78	44	445	1,484	11.2
1998	129	146	1,452	1,402	11.5
1999	198	92	1,366	1,481	11.8
2000	250	178	1,894	...	...

15. In sum, the main trends that have emerged in the aftermath of the crisis are:

- The share of nonregular employment, which was already high by OECD standards, has increased further. The shift of employment to the service sector has also sped up.
- Employers have increased their use of the flexible components (overtime and bonuses) of compensation. Working hours have also become more variable, due to increased reliance on overtime.
- Female participation in the labor market has grown, especially among nonregular workers.
- The increased flexibility of the labor market has been accompanied by robust growth of labor productivity.

D. Remaining Issues

16. The standard workweek is set to be reduced from 44 hours to 40 hours.[9] The reduction has been agreed in principle by the Tripartite Commission. However, the actual date for implementation has not yet been set. The example of France, which recently reduced its workweek, shows the importance of giving employers enough flexibility to accommodate the reduction, in order to minimize the negative impact on productivity and costs.[10]

[9] Also see Min, 2001.

[10] See *France: 2001 Article IV Consultation—Staff Report*, IMF Country Report No. 01/199, October 2001.

17. Although labor market flexibility has increased in Korea since the crisis, the high level of nonregular employment and its continuous rise has raised a number of questions. Is this development linked to the crisis, or is it a more structural trend? If the latter, what are the driving forces behind it? The evidence seems to support the view that the high share of nonregular workers is a more fundamental issue in Korea. The shift from regular to nonregular workers had already been happening prior since the early 1990s. The crisis, and the legalization of temporary work agencies, may therefore have accentuated the situation. Thus, during 1990–99, regular employment grew only by 2 percent, while the number of temporary and daily workers increased by 32 percent and 24 percent, respectively.

18. The large proportion of nonregular employment may be leading to excessively rapid turnover of workers and insufficient training. As the OECD (2000) notes, average tenure in Korea (six years for men and four years for women in 1997) is significantly below the corresponding OECD averages (10½ years and 8½ years, respectively, in 1995). Short tenures, in turn, are likely to reduce the incentive for employers to provide training, with negative implications for productivity growth.

19. The continuing impediments to workforce restructuring seem to be inducing the substitution of nonregular workers for regular workers.

- A large portion of regular workers' compensation come from bonuses, which are not generally paid to temporary or daily workers. In addition, severance pay, applicable to workers with at least one year of tenure, is quite generous by OECD standards.

- Dismissal of regular workers, although allowable under law, must meet strict tests. First, employers must show that they have made every reasonable effort to avoid dismissals. Second, they must consult with workers on criteria for selecting those to be laid off. Third, they must give laid-off workers 60 days advance notice and the Ministry of Labor 30 days in cases involving large numbers of workers. Consequently, dismissal of regular workers is rarely used by employers.

20. Further reforms, therefore, are needed to level the playing field for both types of workers, and to strike an optimal balance between job protection and job creation. The OECD (2000) suggests the following measures:

- Employment protection for regular workers could be further eased to reduce employers' incentives for preferring for nonregular workers.

- The cost of regular workers could be further reduced by gradually phasing out the separation allowance required for such employees.

- Restrictions on temporary employment agencies could be reduced to enhance labor market flexibility. Currently, these agencies cannot participate in manufacturing, are limited to certain firms and only for one year (with a one-time extension), and need to renew their licenses frequently.

21. Further corporate restructuring will require the strengthening of social safety nets. Although Korea has achieved much in restructuring the corporate sector, many firms continue to have excessive leverage and low profitability. Their downsizing will necessarily entail further shocks to the labor force. The adjustment process would be eased if there were more efficient and effective safety nets in place. In this connection, the government plans to extend the coverage of the EIS to more categories of workers in the near future, as the system currently covers regular and temporary workers in all enterprises, but not part-time or daily workers.

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Data Sources

This appendix describes the main sources of the data used in this paper.

The following data series are compiled by the Ministry of Labor and are available on their website (www.molab.go.kr) or the Korean National Statistics Office (www.nso.go.kr). They can also be downloaded from the CEIC© database by subscribers.

- Population, labor force
- Employment, unemployment (including seasonally adjusted)
- Employment and earnings, by productive sector

Data on industrial relations (unionization and labor disputes) can be downloaded from the National Statistics Office's website.

The following were obtained from the *Report on the Monthly Labor Survey*, which is published by the Ministry of Labor.

- Components of earnings
- Type of employment and hours worked

Data on labor productivity and unit labor costs were obtained directly from the Korea Productivity Center (www.kpc.or.kr). They are not currently available on the English version of the website.

III. Changes in the Structure of Financing in Korea[1]

This paper analyzes changes in the financial balance sheets of Korean households and businesses during 1980–2001 to illustrate larger changes in the Korean financial structure, with special focus on the subperiod 1997–2001. There has been a gradual shift to capital market financing, but the financial structures of Korean households and businesses still closely resemble those in bank-centered Japan. Since 1980, businesses have gradually reduced their reliance on bank lending and have turned toward securities issuance for funds. Households, however, have not directly purchased these assets, preferring to channel their savings through financial institutions, which in turn have increased their holdings of securities and stocks. However, the trend toward capital markets has gained momentum since the economic crisis: (a) the stock and bond markets have grown fast; (b) the number of individual stockholders and their trading have increased; and (c) businesses have further reduced their reliance on bank loans. With the increased openness of the economy, the role of foreign finance (especially FDI) has also grown rapidly since 1998.

A. Introduction

1. The growth and structure of the financial system influence economic growth through their effect on savings, the allocation of capital, and the cost of financial intermediation. Hence, the interactions between financial markets and the real economy are of special interest to policy analysts and policy makers. In the case of Korea, its rapid growth over the period 1980–97, the economic crisis that erupted in 1997, and the far-reaching efforts that have been undertaken since 1997 to restructure the corporate and financial sectors provide an interesting backdrop for analyzing these interactions.

2. This paper uses data from the Flow of Funds Accounts (FOF) (see Box III.1) to describe the changes that have occurred to the Korean financial sector during1980–2001. The focus is on households and businesses and particular attention is devoted to the subperiod 1997–2001. The following questions are examined:

- What are the stylized facts of Korean financial development, as revealed in FOF data? Has there been a move toward capital markets and away from bank financing? How does the current structure compare with other economies?

- What was the impact of the crisis that erupted in 1997 on the structure of financing? Has the movement toward capital markets accelerated since then? Are there indications whether these changes will be permanent?

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[1] This paper was prepared by Henry Ma (APD).

Box III.1. The Flow of Funds: Key Concepts

The Flow of Funds Accounts (FOF) of the Bank of Korea (BOK) present a composite picture of the financial surpluses and deficits of the five sectors comprising the Korean economy. These sectors are:

- households (the "individual sector" in the BOK database), which include small private unincorporated companies and nonprofit organizations);
- businesses, which include public corporations;
- financial institutions;
- government; and
- the rest of the world.

FOF data have been compiled in Korea since 1965 and are available on the BOK's website (www.bok.or.kr, "Statistics Database"). For each period (a quarter or a year), a matrix is presented. Matrix rows consist of financial and capital transaction categories, and matrix columns consist of institutional sectors and their sources and uses of funds.[1] The accounts show financial balances (the balance between saving and investment) and describe how these balances flow into financial markets, and to whom and in what manner these funds are supplied. Data on stocks of financial assets and liabilities are also compiled, based on information from the quarterly flows.

For the purposes of this paper, the following key terms are used:

- *Internal funds* are self-generated funds, which are not channeled through financial institutions. They are classified as "Savings" in the nonfinancial transactions Section III of the FOF. Businesses, for example, may use retained earnings.
- *External funds* are funds obtained from financial institutions, financial markets, foreign sources, etc.
  - External funds can be further divided into *domestic funds* (i.e., financing obtained from Korean sources) or *foreign funds* (e.g., foreign direct investment).
  - Alternatively, they can be classified into: *indirect financing*, which is channeled through financial institutions (e.g., bank loans); or *direct financing*, which is obtained through financial markets (e.g., stocks and bonds). Bank-based economies, like Japan or Germany, rely mainly on indirect financing, while economies where capital markets play a bigger role (e.g., the U.S. and the U.K.) rely more on direct financing.

Some caveats should be noted:

- Due to changes in financial asset prices and exchange rates, the data on *flows* and *stocks* may not be consistent.
- Due to differing definitions, there may be inconsistencies between the FOF and data from the monetary authorities and the balance of payments statistics compilers.
- Data on stocks of real assets (e.g., physical plant and offices) are not provided in the FOF. Data on the stock of foreign trade credit are also unavailable, pending the results of the project to compile Korea's International Investment Position.
- Due to differences in how sectors are defined in each country, international comparisons are only approximate. The comparisons provided in this paper are drawn from Bank of Japan (2000).

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[1] More detailed technical information can be found in Bank of Korea (2001), and in the periodic presentations of FOF updates in the BOK's *Quarterly Bulletin*. For an exposition of FOF methodology, see: Fitzpatrick (2001). For similar work in other countries, see: Bank of Japan (2000, 2001), McIntosh (2001), and McIntosh et al (2001).

- Recently, lending to households has boomed, while lending to businesses has slackened. What are the implications for growth and vulnerability of this development?

B. Overall Developments[2]

3. The size and scope of the Korean financial sector have grown substantially since 1980.[3] Between 1980 and 2000, the stock of financial assets outstanding rose from 300 percent of GDP to almost 700 percent (see Figure III.1). Almost every type of financial instrument has increased as a proportion of GDP, with holdings of securities showing the most notable increase.

4. There has been a gradual shift toward capital market financing. Although loans remain the single largest source of credit, their importance relative to other financial instruments has fallen since 1980. By contrast, the share of bonds and stocks as financial instruments has almost doubled (see Figure III.2). Complementary data also show that this trend has deepened since 1997:

- The market capitalization of the Korea Stock Exchange (KSE) rose from a precrisis level of 28 percent of nominal GDP in 1996 to 44 percent of GDP in 2001.

- Similarly, in the bond market, the total amount of corporate bonds outstanding (about 45 percent of all bonds) rose from about 19 percent of GDP (W 86 billion) before the crisis to 27 percent (W 145 billion) in 2001. The volume of corporate bond trading has tripled since 1996.[4]

5. The increasing volume of bonds and stocks has been purchased by financial institutions, rather than directly by individuals. Households continue to hold the bulk of their wealth in the form of deposits and insurance and pension policies (see Section C) and have only recently increased their holdings of stocks. Instead, households have channeled their savings into financial institutions, which in turn have purchased securities and stocks. Thus, financial institutions' share of bond and stock holdings has almost doubled since 1980, while the share directly held by households has fallen (see Figure III.3 and Appendix Table III.2). Meanwhile, with the increasing openness of the economy to foreign capital, foreign ownership of Korean stocks has steadily risen, from zero in 1980 to 25 percent in 2000.

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[2] Park (1994) and Choe and Moosa (1999) also use FOF data to survey Korean financial development, but they do not deal with the impact of the crisis.

[3] Detailed data tables are provided in the Appendix.

[4] Also see "Developments in the Corporate Bond Market," in *Republic of Korea—Selected Issues*, IMF Country Report No. 01/101, July 2001.

Figure III.1: Economy-Wide Stocks of Financial Assets
(In percent of GDP)

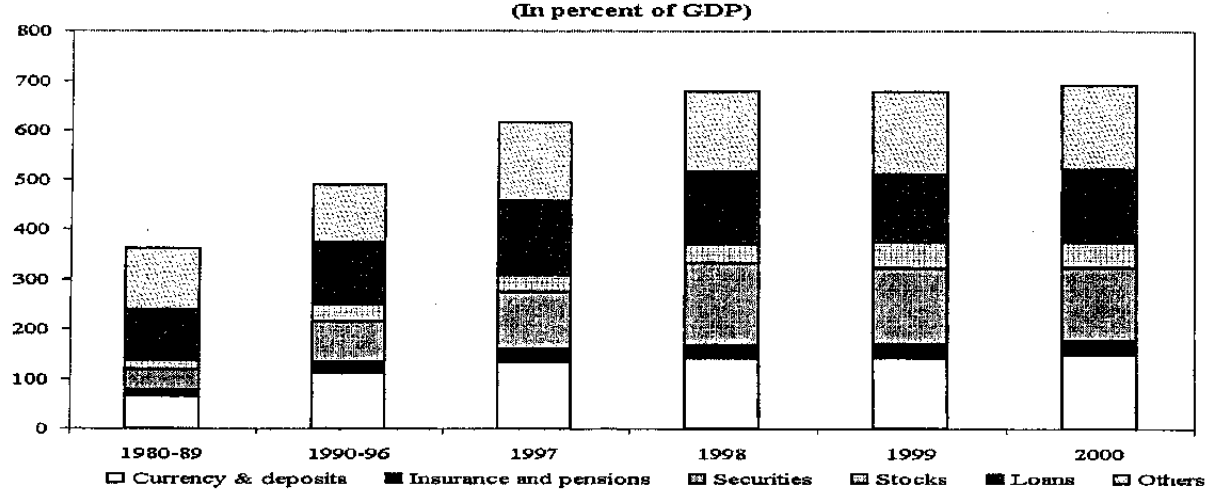


Figure III.2: Selected Financial Instruments
(In percent of total financial assets)

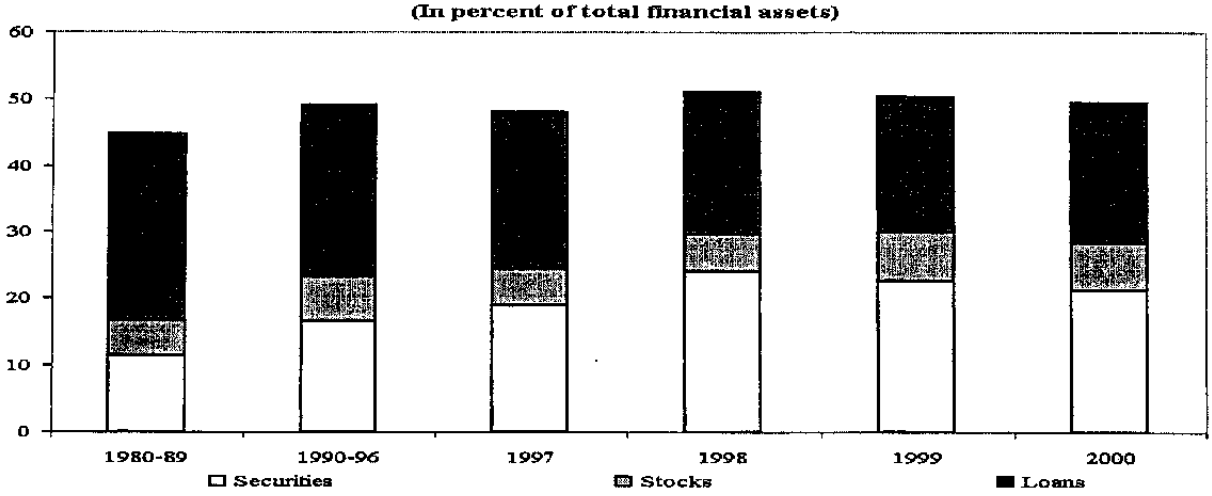
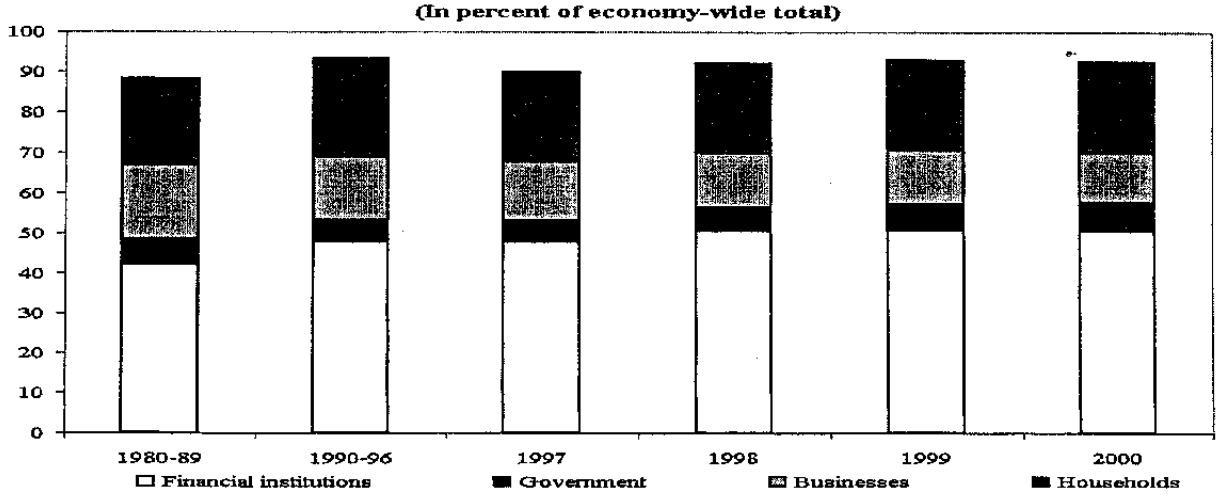


Figure III.3: Sectoral Holdings of All Financial Assets
(In percent of economy-wide total)



6. Since the crisis, commercial bank financing has rebounded strongly and the nonbank sector's role has been sharply reduced. Lending by banks is now a larger share of GDP than lending by nonbanks. Due to these contrasting developments, total credit to the private sector credit from banks and all other financial institutions has fallen as a share of GDP, due initially to the economic downturn and later to government-promoted efforts to deleverage.

Private Sector Credit
(in percent of GDP)

	1997	2001 Dec.
Total	165	143
Loans	118	101
Banks	43	66
Businesses	30	38
Households	13	28
Nonbanks	75	36
Securities	32	32
Banks	5	10
Nonbanks	27	22
Others	15	10
Banks	49	75
Nonbanks	116	67

7. Within the banking sector, credit has shifted away from businesses and toward households and small enterprises. In late-2001, bank credit to households was double its end-1997 level, whereas bank credit to businesses had grown by only 20 percent. Among businesses, small enterprises' share of all business lending by banks rose from 75 percent in 1998 to about 78 percent in mid-2001. However, the data may understate the shift to small enterprises, as part of the lending to households in fact goes to shopkeepers and other small ventures.

C. Households

8. Korean households' financial wealth has grown fast. The fast growth of output and incomes during 1980–2000 and high savings rates led to a robust increase of Korean households' stock of wealth (financial and nonfinancial).[5]

- Household disposable income grew by about 7 percent per annum in real terms. Meanwhile, households' financial assets grew by 13 percent per annum in real terms.

- Consequently, financial assets in nominal terms rose from 95 percent of disposable income to 232 percent, while financial liabilities grew from 36 percent to 96 percent of disposable income. Hence, financial net worth more than doubled, from 59½ percent to 136½ percent of disposable income (see Figure III.4).[6]

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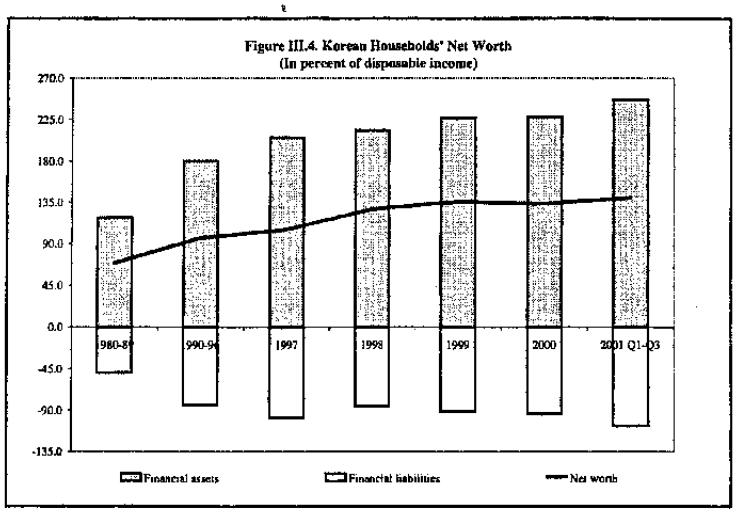
[5] The inflow of funds to households consists of: internal financing or saving (i.e., the portion of disposable income that is not spent on consumption) and external financing (i.e., funds supplied by financial institutions, such as loans and merchandise credit). Households allocate about 75 percent of this total inflow to financial assets; the rest goes to real assets, chiefly housing. This section focuses on financial wealth. In any case, because the National Statistics Office estimates stocks of real assets only every 10 years, such data are not included with the FOF on the BOK website.

[6] In other OECD economies surveyed in Mylonas et al (2000), net worth is about 200–300 percent of disposable income.

- In per capita terms, the average Korean held $915 of financial assets in 1980; by 2000, this sum had grown to $15,000. This was equivalent to an annual growth of 11 percent in real dollar terms.



9. Korean households are cautious and hold the bulk of their wealth as currency, deposits, life insurance, and pension policies. Currency and deposits account for about 60 percent of financial wealth, up from 47 percent in 1980–84 (see Figure III.5). Meanwhile, the share of insurance and pension policies rose from 11 percent to 18 percent over the same period. By contrast, the share of securities (other than stocks) remained unchanged at 12–13 percent until 1998. That year, as the ITC (investment trust company) sector boomed, households' purchases of "beneficiary certificates" jumped, and the share of securities rose to 15 percent. As the ITC sector contracted in 1999–2000, beneficiary certificates were sold or fell in value. Thus, by 2001, the share of securities had fallen to 10 percent.

10. Korean households' portfolios most closely resemble those of Japanese households. As Figure III.6 shows, the composition of household financial assets is broadly similar in both countries. Even compared to Germany, which until recently, has been very bank-centered, Korean households' direct participation in capital markets (through holdings of securities and stocks) is unusually low.

11. Households' participation in the stock market is not as widespread as in the US, but is comparable to Europe. In the US, about 50 percent of all households own stocks and about 50 percent of stocks outstanding are held by households. By contrast, in 2000, only 7 percent of Korean households' financial wealth was held as stocks, and only 22 percent of all stocks outstanding in the economy were held by households. The share of stocks held by households is comparable to Japan and Europe (see Figure III.7).

12. There are signs that a "stockholder culture" is emerging:

- As Korean stock markets boomed in 1999, households allocated 22 percent of their purchases of financial assets that year to stocks, causing the share of stocks in their portfolios to rise from 7 percent to 7¼ percent.

Figure III.5: Korean Households' Financial Assets
(In percent of total)

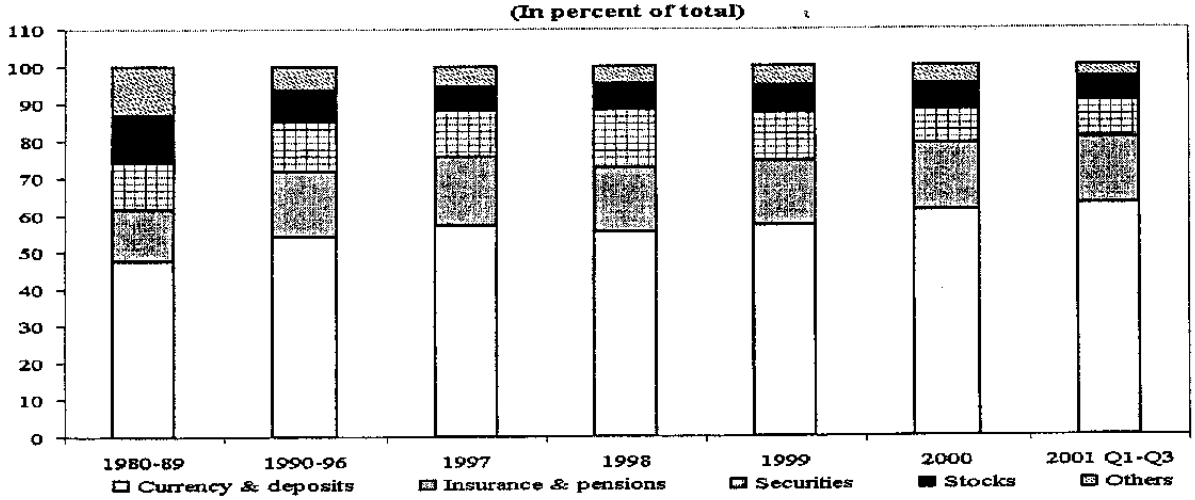


Figure III.6: Cross-country Comparison of Households' Financial Assets
(In percent of total)

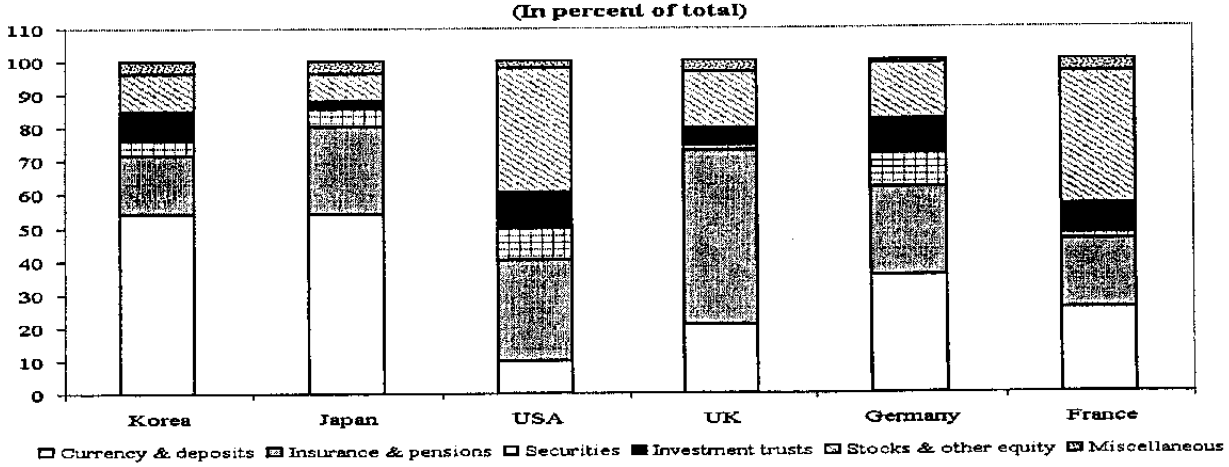
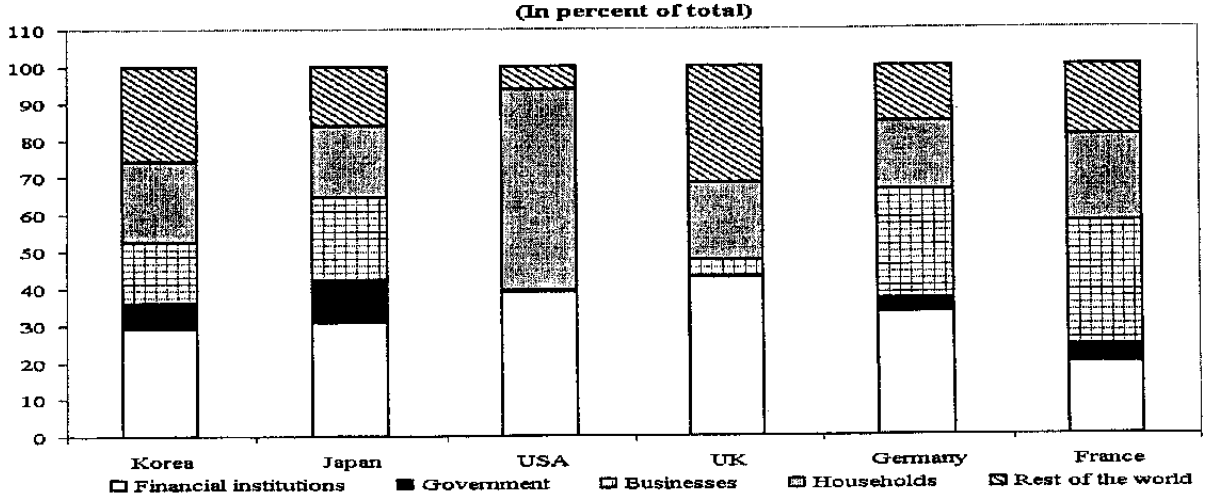


Figure III.7: Cross-country Comparison of Sectoral Holdings of Stocks
(In percent of total)



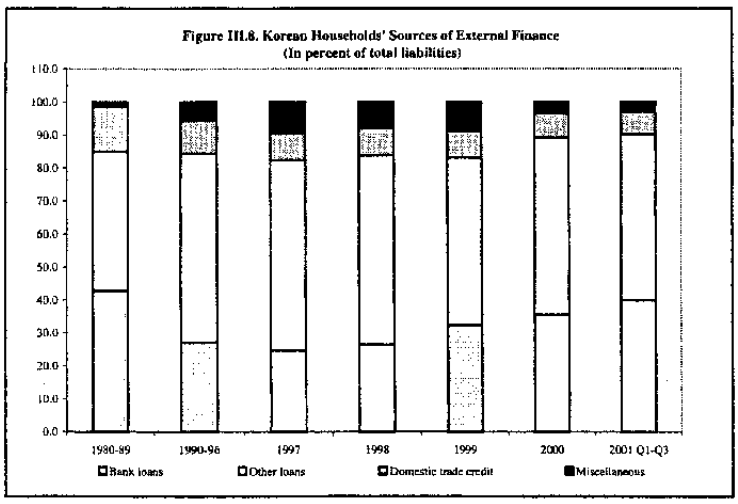
- Between 1997 and 1999, the number of individual investors in the Korea Stock Exchange grew from 1.3 million (3 percent of the population) to 2.9 million (6 percent).[7]

- Korean households that participate in the stock market are very active traders. Although they hold only about 20 percent of all stocks, they account for over 70 percent of trading. On-line trading, in particular, has risen in popularity, with the value of online transactions growing from W 11½ trillion in 1998 to W 1,348 trillion in 2000.

With the weakening of the stock markets in 2000, the flow of household funds to the stock market understandably slackened.

13. On the liability side, households are also cautious and rely on internal funds rather than borrowing from external sources. On average, households obtain two-thirds of their annual inflow of funds from their own resources, reflecting the high savings rate in Korea.

14. Loans remain the largest source of external financing for households. Loans were 89 percent of households' financial liabilities in 1980–84. By 1999, that share had fallen to 83 percent (see Figure III.8). However, in 2000–01, banks substantially redirected credit away from the overleveraged corporate sector (especially the *chaebol*) and toward households and small and medium enterprises, pushing total loans back up to 89 percent of total household liabilities.



- At the end of 1997, loans to households were 30 percent of all bank lending. By September 2001, their share had jumped to 42 percent.

- Loans to households now account for 28 percent of GDP, compared to 13 percent in 1997.

[7] A related study of the Korean stock market can be found in "Linkages Between Domestic and International Asset Markets: The Korean Case," in this volume.

Over the longer run, however, the share of bank loans in total household liabilities has fallen, while the share of other financial institutions has risen, chiefly owing to the category "other loans".

15. Specifically, new forms of consumer finance have boomed. In the 1980s, the only source of external financing that significantly competed with bank loans was "domestic trade credit" (e.g., merchants' charge accounts). Since 1990, however, the categories "other loans" (finance, credit card, leasing, and venture capital companies) and "miscellaneous" (credit card loans, payment advances, retirement allowance reserves, etc.) have grown rapidly and now exceed domestic trade credit. There are some problems with the FOF data for these categories because the statistical base may not have adequately kept up with the rise of new financial institutions. Nevertheless, complementary data confirm the robust growth of consumer finance, especially credit cards:

Household Credit (year-on-year growth rates)

	1999		2000		2001
	H1	H2	H1	H2	H1
Loans for general purposes					
Banks, savings institutions, and	0.2	16.5	23.3	24.7	24.0
insurance companies	-1.5	16.6	21.9	20.5	22.2
Merchandise and finance companies	17.2	16.5	-16.4	-14.2	7.9
Credit card companies	-1.1	63.6	111.6	108.5	75.0
Loans for housing	0.8	5.1	15.9	16.4	7.1

- Data from the BOK's financial surveys show that credit card and merchandise credit doubled as a share of households' disposable income between 1999 and 2000. By contrast, housing loans have grown much more slowly.

- The National Tax Service estimates that credit card usage rose from W 43 trillion in 1999 to about W 125 trillion in 2001.

- More recently, data from the Financial Supervisory Service (FSS) show that, during January–September 2001, sales conducted with credit cards were 113 percent higher than in the same period last year. In September 2001, the average number of cards held per person was three and a half, compared to three in June 2001.

16. With the growth of consumer finance, credit card delinquency has risen slightly.

- According to the FSS, overdue payments on credit cards rose from about 7.9 percent in end-2000 to 8.4 percent in September 2001, raising the ratio of bad loans to total credit card receivables from 2.1 percent to 3¼ percent.

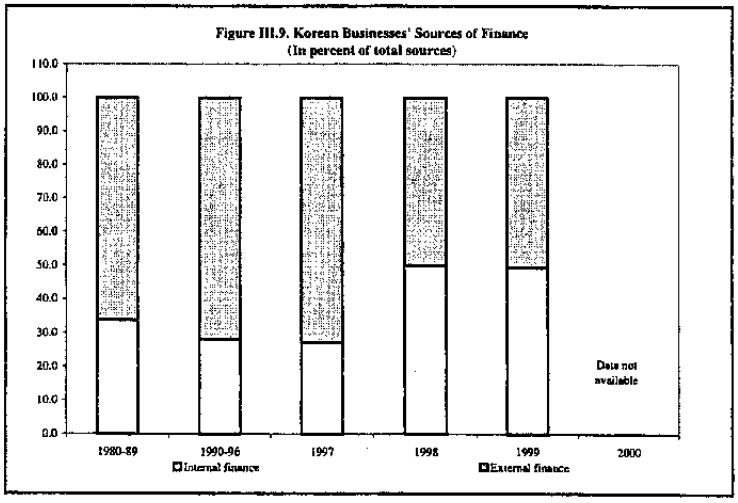
- The number of individuals unable to make monthly credit card payments jumped from 954,000 in August 2001 to 1 million in December 2001, while the number unable to pay finance companies rose from 2½ million at the end of 2000 to 2¾ million in October 2001.

- However, for personal loans by banks, the delinquency rate has remained constant at about 1¼ between December 2000 and September 2001.

17. Despite the rapid increase in debt, the household sector's solvency remains healthy. Financial liabilities as a proportion of disposable income have fallen, while net worth has risen (see Figure III.4). Further, although the share of households in total lending has increased, its current level of 42 percent is still below that of other advanced economies (Moon, 2001). Nevertheless, supervisory authorities should strengthen oversight of lending to households to ensure that the rise in lending to this sector is not accompanied by a deterioration in the quality of loans and rising credit losses.

D. Businesses[8]

18. The composition of business finance has changed substantially since the crisis. First, financing for businesses has shrunk, as businesses have reduced leverage, and as financial institutions have reduced their exposure to businesses. Second, the role of direct finance has increased, mainly through the stock market. Third, the role of foreign capital, especially FDI, has also increased.



19. The 1997–99 crisis forced businesses to resort to internal financing.[9] Before 1997, the share of internal funds had been only about 30 percent of the annual inflow. Since then, about half of all funds raised by

[8] Another perspective, using more recent microlevel data, is provided in "Firm-Level Analysis of the Korean Corporate Sector During 1996–2000," in this volume; and in "Health of the Corporate Sector in Korea," *Republic of Korea—Selected Issues*, IMF Country Report No. 01/101, July 2001.

[9] Because households' allocation decisions have not changed much each year, the discussion in that section focused on data on *stocks* of financial instruments. In the case of businesses, however, it is more instructive to use data on *flows*. In the FOF, the sources of financing for businesses are: internal financing (the sum of nonfinancial corporations' disposable income,

(continued)

businesses has come from their own saving (see Figure III.9 and Appendix Table III.8). In nominal terms, the net inflow of external finance halved between 1997 and 1998 and has remained the same since then. In real terms, net external financing is back down to its level in 1989. However, this contraction does not necessarily indicate that the business sector is being starved of funds, as previous inflows may have financed excessive investment.

20. Businesses' reliance on direct finance has increased (see Figures III.10–11):

- Loans in general have shrunk in importance as a source of external finance, but within that category, the share of bank lending has increased. Before 1997, lending was the main source of funds for businesses. In 1998, with the banking sector in crisis, loans were actually negative as businesses had to repay debt without obtaining new loans. Since then, the share of lending has picked up, but has not recovered its precrisis level, as banks have resumed lending, while the nonbank sector (e.g., merchant banks) has shrunk in size. Further, the composition of bank lending has changed, as banks have shifted their focus to small and medium enterprises, which are still relatively underleveraged.

- There have been sharp swings in the share of securities in business finance. In 1998, with bank loans drying up, business resorted to issuing medium-term securities (mainly three-year corporate bonds), whose share soared to 168 percent of the annual inflow. These securities were mainly bought by the ITCs, the traditional purchasers. However, as the ITC sector collapsed in 1999–2000, issuing bonds became unfeasible.[10] Issuances (excluding asset-backed securities) fell by about 33 percent in 2000, and maturities tended to shorten.

- With loans and bonds being erratic sources of financing, businesses have increased their reliance on the stock market. Since the crisis, the amount of financing through equity issuance has almost doubled. The stock market boom of 1998–99 coupled with further liberalization of the capital account attracted funds from domestic investors and foreign portfolio investors.

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depreciation—which is not a cash outlay and is therefore also disposable—and some capital transfers) and external financing (loans, bond issuances, foreign direct investment, etc.). Businesses then use these funds to purchase real assets and financial assets. As with households, data on stocks of real assets (e.g., factories and offices) are not provided in the FOF.

[10] The rise and fall of the ITCs is described in Chapter VI of *Republic of Korea—Economic and Policy Developments*, IMF Country Report No. 00/11, February 2000.

Figure III.10: Korean Businesses' Sources of External Finance
(In Percent of Total Inflows)

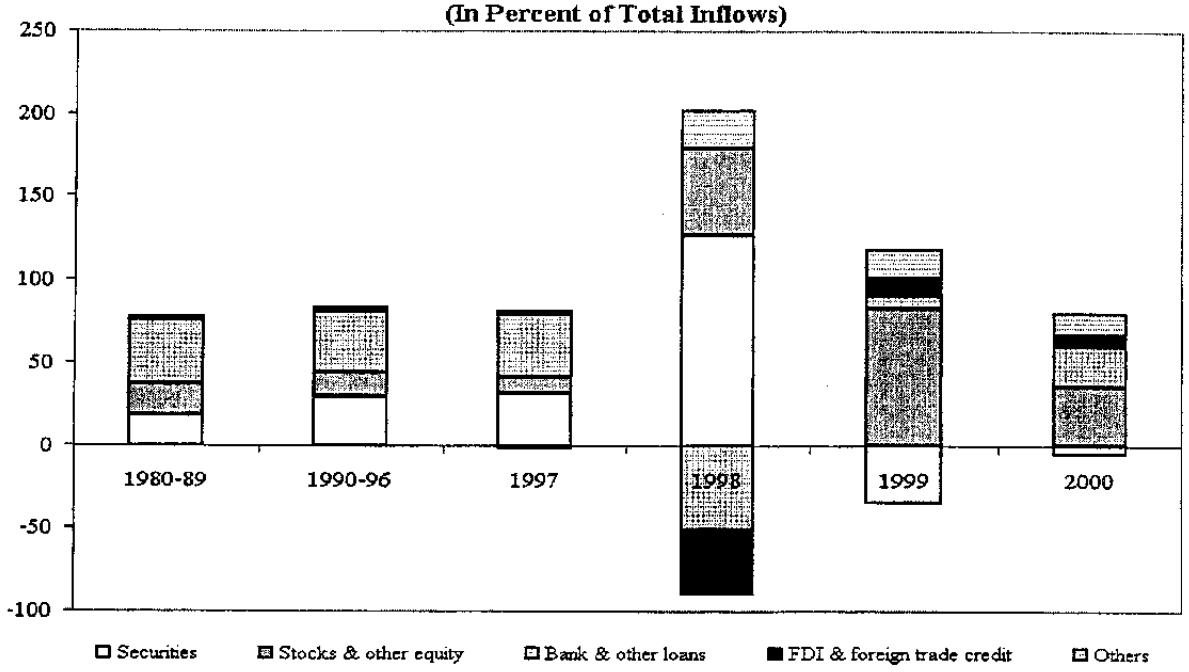
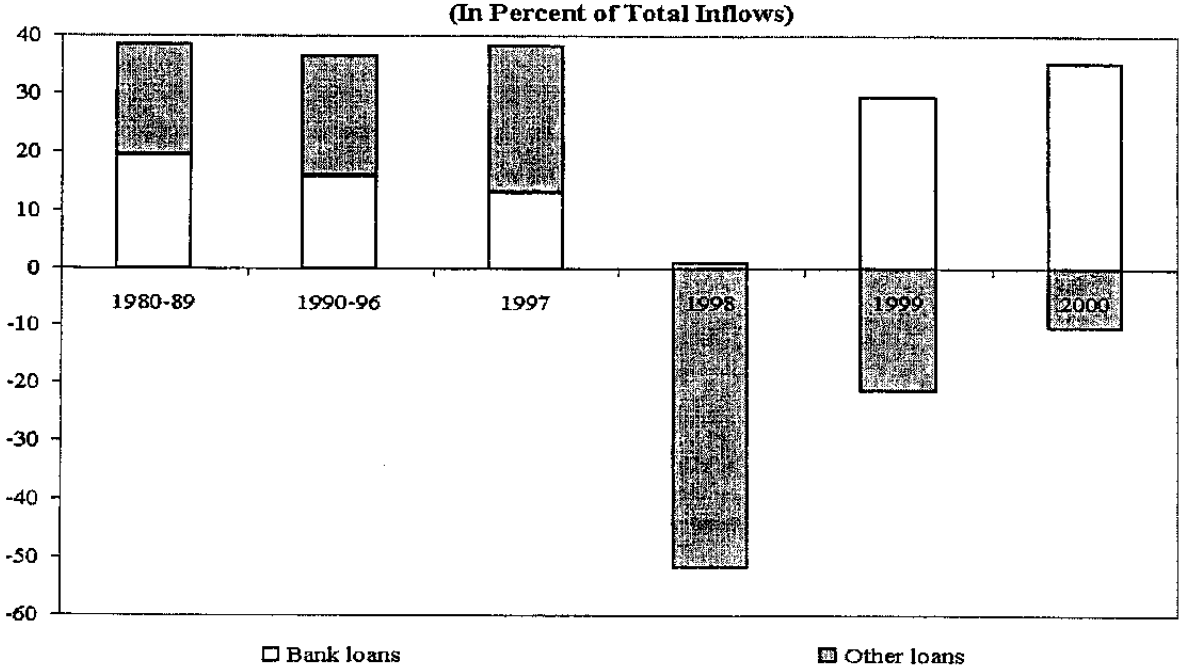


Figure III.11: Korean Businesses' Sources of Loans
(In Percent of Total Inflows)



21. The role of foreign finance has grown (see Figure III.12):

- The share of FDI has jumped. With policy reforms to allow increased foreign participation in the Korean economy, including through purchases of troubled corporations, FDI inflows more than doubled in 1998. Between 1997 and 2000, the volume of FDI quadrupled, and its share rose from 2 percent of total business financing to 13 percent.

- Foreign trade credit contracted in 1998, but has recovered. Trade credit turned into a net outflow during the crisis, as short-term funding dried up in general. By 2000, however, the share of foreign trade credit was three times that in 1996.

- The increased role of FDI has positive long-term implications. If sustained, it would further Korea's integration in the global market and foster the transfer of technology and management practices. The entry of foreign investors would also have the potential to strengthen corporate governance and market discipline.

22. Despite the recent changes, the financial structure of Korean businesses still looks much like Japan's. Thus, dependence on bank loans is still higher than in Europe or the U.S., while the share of securities and stocks is still much lower.

E. Conclusion

23. The growth in the role of direct financing and capital markets has sped up since 1998, partly due to restructuring efforts initiated during the economic crisis. Businesses, spurred by requirements to deleverage, have reduced their reliance on bank loans, and have turned to issuances of securities and foreign capital. For their part, banks have turned their attention to the relatively underleveraged households and small enterprises. Meanwhile, households' participation in the securities and stock markets has increased.

24. However, banks will continue to be important. In fact, with the sharp contraction of the nonbank sector, banks have increased their share of total credit, mainly due to increased lending to households for consumption. Household debt levels have increased rapidly, but their solvency is still healthy. Nevertheless, stronger oversight of consumer lending will be important, along with broader efforts to strengthen the effectiveness of supervision.

25. The increased role of direct finance has implications for corporate governance. In bank-centered economies, supervision of borrowers is exercised through close monitoring by creditors. In economies with a larger role for capital markets, corporate governance is also exerted through shareholder activism, takeovers, and buyouts. In the case of Korea, shareholder initiatives have begun to emerge, and could be reinforced with the growth of capital markets. Meanwhile, foreign investors could also be a new source of shareholder pressure.

Figure III.12: Korean Businesses' Sources of Foreign Finance
(In percent of total inflows)

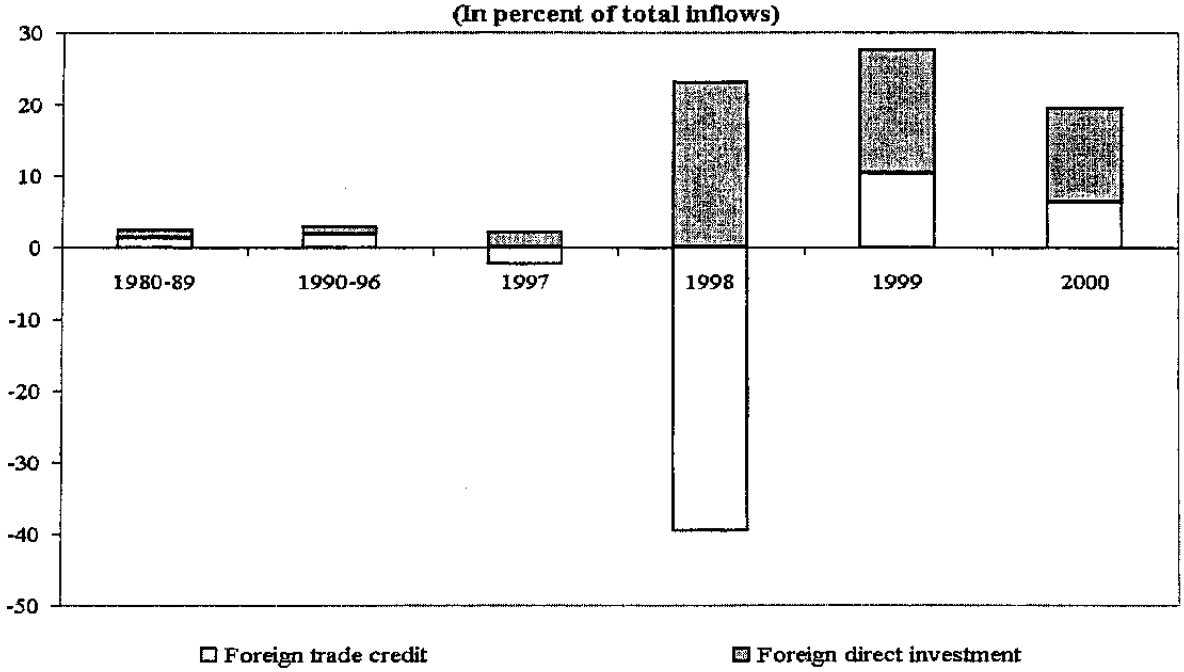
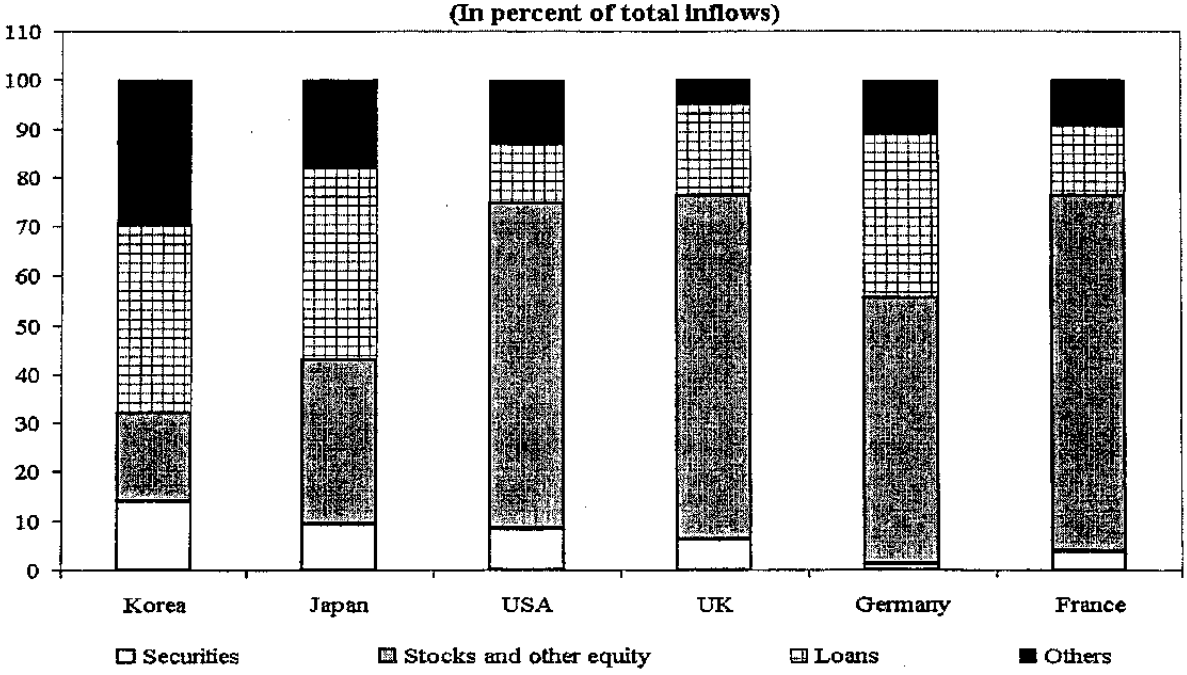


Figure III.13: Cross-country Comparison of Sources of Business Finance
(In percent of total inflows)



26. The recent changes in the structure of financing could also have an impact on the monetary transmission mechanism. Further research could be done on the implications of the following:

- The growth in the size of household assets (especially stocks), is likely to imply a significant rise in the strength of the wealth effect, as Mylonas et al (2000) note. In this connection, Choe and Lee (1999) find that the effect of stock price fluctuations on consumption has risen since the 1980s, and this may be related to the increased size and breadth of household wealth.

- "Credit channel" theories of monetary policy (e.g., Bernanke and Blinder, 1992) argue that the contraction of bank credit that accompanies a monetary tightening provides an additional channel for monetary transmission. This channel is especially relevant for entities that are dependent on bank loans, which has been the case for most Korean firms until recently. However, with the rise of alternatives to bank loans, this additional channel could weaken in Korea.

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APPENDIX

Table III.1. Distribution of Types of Financial Assets
(In percent)

	1980–84	1985–89	1990–97	1997	1998	1999	2000
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Currency and transferable deposits	**4.4**	**4.8**	**3.1**	**1.7**	**1.5**	**1.8**	**1.8**
Other deposits	**11.8**	**15.1**	**19.8**	**19.9**	**19.3**	**19.2**	**19.7**
Life insurance and pension funds	**2.1**	**3.8**	**4.4**	**4.1**	**3.9**	**3.9**	**4.0**
Short-term securities	**2.7**	**3.9**	**4.1**	**3.7**	**3.7**	**3.1**	**3.1**
Government and public bonds	0.3	0.5	0.5	0.2	0.2	0.1	0.1
Financial debentures	1.1	2.1	1.7	0.8	1.5	1.6	1.8
Commercial paper	1.3	1.3	2.0	2.7	2.1	1.4	1.2
Long-term securities	**7.5**	**8.7**	**12.3**	**15.2**	**20.3**	**19.5**	**18.1**
Government and public bonds	1.5	1.0	1.1	1.2	1.6	2.1	2.2
Financial debentures	0.6	0.8	1.7	1.9	2.0	1.8	2.5
Corporate bonds	2.3	3.0	4.7	5.4	7.7	7.9	8.0
Beneficiary certificates	1.3	2.5	3.2	3.2	6.3	5.6	3.7
Foreign debentures	1.9	1.4	1.6	3.6	2.6	2.1	1.7
Stocks	**4.9**	**5.6**	**6.9**	**5.5**	**5.6**	**7.4**	**7.1**
Loans	**25.6**	**26.2**	**24.6**	**22.2**	**19.6**	**18.5**	**19.2**
BOK	3.5	2.9	1.0	0.5	0.5	0.3	0.2
Deposit money banks	12.9	12.0	10.0	8.8	7.8	8.4	9.2
Insurance companies	1.0	2.0	2.3	2.1	1.7	1.6	1.5
Investment and finance companies	1.1	1.3	1.1	0.7	0.5	0.4	0.2
Other loans	7.0	8.1	10.1	10.1	9.1	7.9	6.8
Nonbanking financing corporations	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Government loans	**2.6**	**1.9**	**1.4**	**1.5**	**1.8**	**1.9**	**2.0**
Equities other than stocks	**3.9**	**3.6**	**1.8**	**1.2**	**1.2**	**1.6**	**1.2**
Domestic trade credit	**6.8**	**6.3**	**4.3**	**3.5**	**3.0**	**2.9**	**2.8**
Foreign exchange holdings	**2.9**	**1.8**	**1.2**	**1.0**	**2.1**	**2.6**	**3.4**
Foreign trade credit	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Direct investment	**0.6**	**1.0**	**1.2**	**2.0**	**2.0**	**2.2**	**2.6**
Other foreign claims and debts	**14.5**	**7.5**	**4.7**	**8.2**	**5.7**	**4.8**	**4.8**
Miscellaneous	**9.6**	**9.9**	**10.3**	**10.2**	**10.3**	**10.6**	**10.1**

Source: Bank of Korea, Flow of Funds, (www.bok.or.kr)

Table III.2. Distribution of Selected Financial Assets, by Type of Holder

(In percent)

	1980	1985	1990	1995	1996	1997	1998	1999	2000	2001 Q3
All financial assets										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	37.8	41.3	47.5	48.3	47.9	47.8	50.6	50.9	50.6	51.0
Government	6.6	6.0	5.9	4.9	5.1	5.1	5.8	6.4	7.0	7.2
Businesses	19.9	18.4	17.4	16.1	15.8	15.0	13.6	13.3	12.6	12.7
Households	18.6	20.1	25.4	25.2	24.3	22.1	22.3	22.3	22.4	22.1
Rest of the world	17.0	14.0	3.9	5.5	6.9	10.0	7.8	7.1	7.4	6.9
Currency, gold, and deposits										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	14.6	20.7	11.5	9.7	10.0	12.0	13.0	12.6	10.9	10.2
Government	5.9	4.7	8.4	5.6	5.5	5.1	5.5	5.9	6.1	5.8
Businesses	27.4	21.9	24.4	24.9	25.2	24.3	22.2	20.8	19.5	19.4
Households	51.9	51.6	55.7	59.6	59.3	58.4	58.9	60.5	63.3	64.2
Rest of the world	0.2	1.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3
Stocks										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	17.4	17.9	47.0	43.8	40.7	33.4	28.3	37.5	29.2	27.6
Government	12.7	2.7	5.2	5.3	5.5	4.6	6.6	6.5	6.7	6.4
Businesses	13.7	23.9	12.7	13.9	15.1	15.4	18.3	15.5	16.4	21.0
Households	56.2	55.5	35.1	27.2	25.7	26.0	27.5	22.0	21.8	18.9
Rest of the world	0.0	0.0	0.0	9.7	12.9	20.6	19.2	18.6	25.9	26.1
Corporate bonds										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	76.3	86.9	90.0	94.6	88.7	89.7	96.6	91.4	89.5	86.8
Government	1.9	1.8	1.2	1.6	3.0	1.6	2.1	4.0	7.1	8.3
Businesses	11.0	7.6	5.7	3.0	5.8	5.6	0.9	2.8	1.9	2.8
Households	10.8	3.6	3.2	0.7	2.5	2.9	0.4	1.7	1.3	2.0
Rest of the world	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.2
Corporate bonds										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	76.3	86.9	90.0	94.6	88.7	89.7	96.6	91.4	89.5	86.8
Government	1.9	1.8	1.2	1.6	3.0	1.6	2.1	4.0	7.1	8.3
Businesses	11.0	7.6	5.7	3.0	5.8	5.6	0.9	2.8	1.9	2.8
Households	10.8	3.6	3.2	0.7	2.5	2.9	0.4	1.7	1.3	2.0
Rest of the world	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.2

Source: Bank of Korea, Flow of Funds, (www.bok.or.kr)

Table III.3. Distribution of Selected Financial Liabilities, by Type of Debtor

(In percent)

	1980	1985	1990	1995	1996	1997	1998	1999	2000	2001 Q3
Loans (incl. govt-provided)										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	13.9	15.8	13.1	8.3	8.4	10.1	13.6	13.4	14.7	13.0
Government	4.9	4.6	2.1	1.3	1.2	0.9	1.7	1.5	1.4	1.5
Businesses	61.5	55.4	49.0	51.2	50.8	51.7	49.7	48.5	45.2	43.8
Households	19.6	24.2	35.8	39.1	39.6	37.2	35.1	36.6	38.7	41.7
Bank loans										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	1.5	2.0	7.1	3.8	4.4	3.3	2.8	2.7	7.2	3.7
Government	1.1	1.7	1.1	1.0	1.0	0.8	0.8	0.7	0.7	0.6
Businesses	72.2	67.4	59.5	64.2	63.3	65.6	66.1	62.1	56.3	53.9
Households	25.1	28.9	32.3	31.0	31.2	30.3	30.2	34.5	35.7	41.7
Securities										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	39.9	39.4	50.0	42.2	38.6	39.4	50.6	55.6	62.6	63.5
Government	4.2	0.1	4.1	1.7	1.8	1.6	2.3	3.7	4.3	4.1
Rest of the world	2.9	1.1	1.1	1.4	2.1	2.3	1.6	1.3	1.0	1.1
Stocks										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	12.2	16.3	24.4	17.1	17.3	17.5	21.3	26.1	25.7	27.2
Businesses	87.8	83.7	75.6	82.9	82.7	82.5	78.7	73.9	74.3	72.8
Corporate bonds										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Financial institutions	0.0	0.4	0.1	0.0	1.2	7.7	20.7	29.3	42.4	47.4
Businesses	100.0	99.6	99.9	100.0	98.8	92.3	79.3	70.7	57.6	52.6

Table III.4. Households' Financial Assets and Liabilities

(In percent of disposable income)

	1980–84	1985–89	1990–97	1997	1998	1999	2000 1/
Financial assets	**95.0**	**132.4**	**180.5**	**205.7**	**213.4**	**226.9**	**227.7**
Gold and currency	4.0	3.3	3.7	3.6	3.1	4.4	3.6
Deposits	40.8	60.0	94.0	113.6	114.4	124.8	134.9
Life insurance and pension funds	10.4	21.8	32.2	38.3	37.1	39.6	41.0
Securities	12.0	16.9	23.9	25.4	33.3	29.4	20.8
Short-term securities	3.6	3.2	2.8	2.0	0.6	0.8	0.5
Of which: Financial debentures	0.2	1.1	0.8	0.2	0.2	0.4	0.3
Of which: Commercial paper	3.1	2.0	2.0	1.8	0.4	0.4	0.2
Long-term securities	8.4	13.7	21.1	23.4	32.7	28.6	20.3
Government and public bonds	1.2	0.6	1.8	2.4	2.8	2.6	2.4
Financial debentures	1.3	1.1	2.4	2.5	2.4	0.9	2.1
Corporate bonds	0.6	0.3	0.9	1.4	0.3	1.4	1.0
Beneficiary certificates	5.3	11.7	16.1	17.1	27.3	23.6	14.8
Stocks	14.0	14.4	15.0	13.2	14.7	16.5	15.8
Other equity	6.3	6.0	4.9	4.8	4.2	4.3	3.7
Miscellaneous	7.5	10.2	6.8	6.7	6.5	8.1	8.0
Financial liabilities	**35.7**	**57.3**	**84.2**	**100.1**	**85.7**	**91.1**	**93.9**
Loans	31.5	46.7	71.0	82.5	71.9	75.7	83.6
Banks	18.2	20.5	22.7	24.8	22.7	29.5	33.4
Other institutions, incl. Govt.	13.2	26.2	48.3	57.7	49.2	46.2	50.2
Domestic trade credit	4.2	9.5	8.2	8.1	7.0	7.2	7.0
Miscellaneous	0.0	1.2	5.0	9.5	6.8	8.2	3.3
Financial net worth	**59.4**	**75.1**	**96.3**	**105.6**	**127.7**	**135.8**	**133.8**

Source: Bank of Korea, Flow of Funds, (www.bok.or.kr)

1/ Disposable income for 2000 is an estimate.

Table III.5. Households' Financial Assets and Liabilities

(In percent of totals)

	1980–84	1985–89	1990–97	1997	1998	1999	2000	2001 Q3
Financial assets	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Gold and currency	4.3	2.5	2.1	1.8	1.5	1.9	1.6	1.9
Deposits	42.9	45.3	51.8	55.2	53.6	55.0	59.3	60.6
Life insurance and pension funds	10.7	16.4	17.8	18.6	17.4	17.4	18.0	17.6
Securities	12.5	12.7	13.3	12.4	15.6	13.0	9.1	10.0
Short-term securities	3.8	2.4	1.6	1.0	0.3	0.3	0.2	0.5
Of which : Financial debentures	0.2	0.8	0.4	0.1	0.1	0.2	0.1	0.0
Of which : Commercial paper	3.3	1.5	1.1	0.9	0.2	0.2	0.1	0.4
Long-term securities	8.7	10.2	11.7	11.4	15.3	12.6	8.9	9.6
Government and public bonds	1.2	0.4	1.0	1.2	1.3	1.2	1.0	0.9
Financial debentures	1.4	0.8	1.3	1.2	1.1	0.4	0.9	0.9
Corporate bonds	0.7	0.2	0.5	0.7	0.2	0.6	0.5	0.8
Beneficiary certificates	5.4	8.8	8.9	8.3	12.8	10.4	6.5	7.0
Stocks	14.9	10.8	8.4	6.4	6.9	7.3	6.9	6.5
Other equity	6.7	4.6	2.8	2.3	1.9	1.9	1.6	1.6
Miscellaneous	8.1	7.8	3.8	3.2	3.1	3.6	3.5	1.7
Financial liabilities	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Loans	89.0	81.5	84.4	82.4	83.9	83.2	89.1	90.1
Banks	52.1	36.3	27.1	24.8	26.5	32.4	35.6	40.0
Other institutions, incl. Govt.	36.9	45.2	57.3	57.6	57.4	50.8	53.5	50.1
Domestic trade credit	11.0	16.7	9.8	8.1	8.2	7.9	7.4	6.8
Miscellaneous	0.0	1.8	5.8	9.5	8.0	9.0	3.5	3.0

Source: Bank of Korea, Flow of Funds, (www.bok.or.kr)

Table III.6. Financial Liabilities of Businesses

(In percent of total)

	1980–84	1985–89	1990–97	1997	1998	1999	2000	2001 Q3
Short-term securities	**3.5**	**4.1**	**6.7**	**7.9**	**6.6**	**4.7**	**3.6**	**4.3**
Government & public bonds	0.6	0.7	1.1	0.5	0.5	0.5	0.2	0.2
Of which: commercial paper	2.9	3.4	5.7	7.4	6.1	4.2	3.4	4.1
Long-term securities	**7.4**	**9.7**	**15.8**	**18.6**	**23.1**	**21.9**	**19.1**	**20.1**
Government & public bonds	0.4	0.5	0.8	0.7	0.7	0.7	0.7	0.7
Of which: corporate bonds	5.2	7.6	13.5	14.9	19.7	18.7	15.9	16.6
foreign debentures	1.8	1.6	1.6	3.1	2.7	2.5	2.4	2.7
Stocks	**9.2**	**10.6**	**12.1**	**10.4**	**11.6**	**14.3**	**15.2**	**15.6**
Other equity	**6.7**	**7.6**	**4.1**	**2.7**	**2.8**	**3.0**	**3.1**	**3.2**
Loans	**36.0**	**38.1**	**37.9**	**36.8**	**34.1**	**33.1**	**33.2**	**32.5**
Of which: bank loans	19.4	20.0	18.1	17.3	16.7	17.5	17.9	17.8
Trade credit	**13.4**	**12.0**	**9.1**	**8.0**	**7.1**	**7.4**	**7.4**	**7.4**
Direct investment	**1.0**	**1.2**	**1.4**	**2.1**	**2.4**	**3.1**	**4.3**	**4.6**
Other foreign claims and debts	**8.9**	**3.9**	**3.5**	**5.7**	**3.4**	**3.4**	**4.0**	**3.3**
Miscellaneous	**14.1**	**12.6**	**9.3**	**7.8**	**8.8**	**9.1**	**10.1**	**9.0**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Bank of Korea, Flow of Funds, (www.bok.or.kr)

Table III.7. Asset Accumulation by Businesses

(In billion won; growth rates in parentheses)

	1980–84	1985–89	1990–97	1997	1998	1999	2000	2001 Q1-Q3
In current prices								
Physical assets	11,532	22,573	77,080	104,010	53,288	78,958	...	...
		(95.7)	(241.5)	(-3.2)	(-48.8)	(48.2)	...	...
Financial assets	6,641	12,219	35,693	54,134	-1,187	23,998	34,030	21,355
		(84.0)	(192.1)	(8.4)	(-102.2)	(-2,122.1)	(41.8)	(-37.2)
Total	18,174	34,792	112,773	158,143	52,101	102,956	...	...
		(91.4)	(224.1)	(0.5)	(-67.1)	(97.6)	...	...
In constant prices 1/								
Physical assets	28,161	40,815	84,361	97,064	47,333	71,592	...	...
		(44.9)	(106.7)	(-6.1)	(-51.2)	(51.3)	...	...
Financial assets	16,488	21,850	38,955	50,519	-1,054	21,759	31,343	19,317
		(32.5)	(78.3)	(5.1)	(-102.1)	(-2,164.1)	(44.0)	(-38.4)
Total	44,649	62,666	123,316	147,582	46,279	93,352	...	...
		(40.4)	(96.8)	(-2.6)	(-68.6)	(101.7)	...	...
Shares (in percent)								
Physical assets	63.5	64.9	68.3	65.8	102.3	76.7	...	...
Financial assets	36.5	35.1	31.7	34.2	-2.3	23.3	...	...

Source: Bank of Korea, Flow of Funds, (www.bok.or.kr)

1/ Deflated using the GDP deflator.

Table III.8. Sources of Financing for Businesses

(In units indicated)

	1980-84	1985-89	1990-97	1997	1998	1999	2000	2001
In percent of total annual financing								
Internal finance 1/	29.1	39.5	28.1	27.1	50.0	49.4	...	...
External finance 2/	70.9	60.5	71.9	72.9	50.0	50.6	...	...
Composition of external finance (in percent of total)								
Securities	16.5	17.4	29.4	31.1	126.1	-34.1	-5.2	68.6
Short-term securities 3/	5.2	6.6	8.5	3.7	-41.7	-30.4	-5.3	21.8
Long-term securities 4/	11.3	10.7	20.9	27.3	167.8	-3.6	0.1	46.8
Of which : foreign debentures	1.4	0.5	2.1	3.6	2.0	1.7	1.9	8.4
Stocks	8.5	17.4	12.3	7.6	48.2	77.6	31.3	29.5
Other equity	7.4	5.0	2.5	2.2	4.3	4.9	4.3	8.0
Loans	39.4	37.4	36.4	38.1	-50.9	7.8	24.5	15.6
Banks	17.8	21.8	15.8	12.9	0.9	29.3	35.1	15.7
Other institutions, incl govt.	21.7	15.6	20.6	25.2	-51.8	-21.5	-10.6	-0.1
Domestic trade credit	14.9	9.8	7.8	10.6	-26.9	10.2	6.8	7.4
Foreign financing	2.4	1.3	4.4	2.0	-35.7	22.4	21.8	-9.7
Of which : foreign trade credit	1.3	0.3	1.7	-2.3	-39.5	10.3	6.2	-8.8
Of which : direct investment	0.4	2.2	1.1	2.1	23.1	17.3	13.3	8.5
Miscellaneous	10.9	11.8	7.3	8.4	34.8	11.1	16.5	-19.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total financing (in billion won)	**18,967**	**35,485**	**113,644**	**162,024**	**56,080**	**104,646**	**...**	**...**
Internal funds								
In billion won	5,659	13,635	31,650	43,980	28,063	51,651	...	...
(Growth rate)		140.9	132.1	14.3	-36.2	84.1	...	...
In billion constant won 5/	13,561	24,731	34,742	41,043	24,927	46,832	...	...
(Growth rate)		82.4	40.5	10.8	-39.3	87.9	...	...
External funds								
In billion won	13,308	21,850	81,993	118,045	28,018	52,995	66,531	40,589
(Growth rate)		64.2	275.2	-0.4	-76.3	89.1	25.5	-39.0
In billion constant won 5/	32,988	39,186	89,526	110,162	24,887	48,051	61,278	36,715
(Growth rate)		18.8	128.5	-3.4	-77.4	93.1	27.5	-40.1

Source: Bank of Korea, Flow of Funds, (www.bok.or.kr)

1/ Internal funds are "Savings" in the nonfinancial transactions section of the Flow of Funds.
2/ External funds are "Sources" in the financial transactions section of the Flow of Funds.
3/ Mainly commercial paper
4/ Mainly corporate bonds
5/ Deflated using the GDP deflator.

IV. Linkages Between Domestic and International Asset Markets: The Korean Case[1]

This paper analyzes the role of global, regional and domestic factors in Korean asset markets, focusing on the equity, currency and external debt markets. The statistical analysis indicates a strong impact on Korean asset prices from global and regional financial variables and also from the net flows of foreign investors. The sign of the correlations invariably indicates that Korean assets perform well and inflows occur when asset prices elsewhere are rising, suggesting that Korean investments are viewed as a high-beta or cyclical ones. Yet Korean assets have fared relatively well in the current global slowdown, suggesting that strong linkages with global financial markets need not be destabilizing if the domestic economy and macroeconomic policies are sound.

A. Introduction

1. The increasing openness of the Korean economy has been accompanied by stronger linkages between domestic and international asset markets. This paper explores the nature of those linkages, using high-frequency (i.e., daily and weekly) data to focus on the way that information flows between markets and shocks are transmitted. The aim is not to test particular asset pricing models but to use regression analysis to draw inferences about the correlations between different assets and possible causal relationships. The analysis deals with the current linkages rather than historical ones, so the paper concentrates on the post-crisis period of January 1999 to November 2001.[2] Thus the start date corresponds approximately to the date of the upgrade of Korea's sovereign credit rating back to investment grade, and also to approximately one year after the liberalization of capital inflows into equity and bond markets. The focus is predominantly on the equity market, where data are best and—unlike the bond market—foreign participation is quite high, although there is also analysis of the foreign exchange market and of the pricing of Korea's sovereign foreign currency debt.

2. The paper is organized as follows. Section B provides a brief description of the structure and recent trends in the Korean equity market. Section C provides econometric analysis of price determination in the equity market, focusing on the links with international markets, while Section D examines the role of foreign investors. In Section E, the currency market is studied. Section F contains some analysis of the pricing of Korea's sovereign external bonds. Section G concludes.

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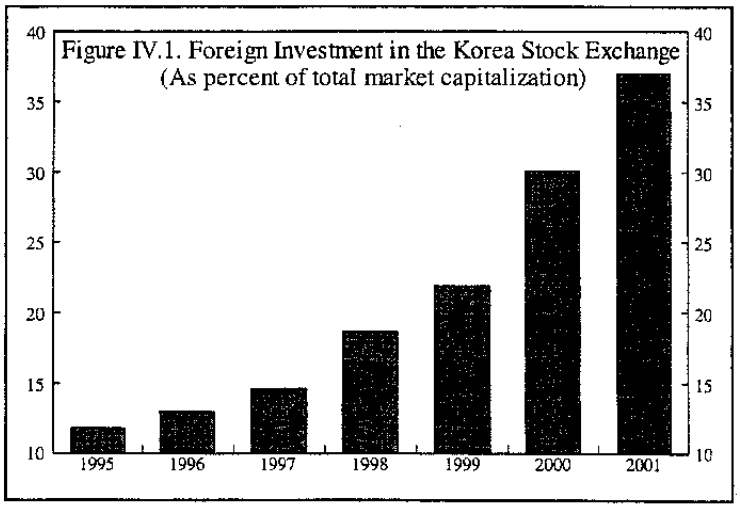
[1] This paper was prepared by Anthony Richards (APD).

[2] See, for example, Hahm and Mishkin (2000) for an analysis of Korean asset prices during the crisis period.

B. The Korean Equity Market: Structure and Recent Trends[3]

3. There are two stock markets in Korea—the main-board Korea Stock Exchange, and the KOSDAQ market, which focuses on technology and venture companies. The market capitalization of the two markets were W 256 trillion and W 52 trillion, respectively, at the end of 2001, equivalent to a total market capitalization of $256 billion. In terms of its share in the most widely used emerging markets equity benchmark (the MSCI EMF index), the Korean stock market is the largest emerging market, accounting for 17.8 percent of that index in January 2002 (with a significant increase expected due to index methodology changes scheduled later in 2002).

4. The liberalization of foreign investment in the Korean equity market began in January 1992. Ceilings on aggregate foreign investment were gradually increased through the 1990s and completely removed in May 1998.[4] As result of positive net inflows in every year since 1992, foreign ownership had reached about 37 percent of all KSE stocks at the end of 2001, with a large majority of this having occurred via portfolio investment rather than through foreign direct investment (Figure IV.1). Foreign holdings are concentrated in the larger, blue-chip stocks, and foreign holdings of companies such as Samsung Electronics and POSCO are now over 50 percent. These levels of foreign ownership are higher than for many other emerging markets, but are not out of line with foreign ownership levels in many other medium-sized industrial countries.



5. Trading on the KSE occurs in opening and closing auctions, as well as continually between these auctions. Trading has been fully computerized since September 1997. "On-line" trading (mainly via the internet, but also through other systems that transmit orders directly from the investor to the trading system) now accounts for over 60 percent of all trades in Korea, the highest such ratio in the world. The share of on-line trading is highest on the KOSDAQ—at nearly 80 percent, versus about 50 percent on the KSE—where the role of

[3] The Korea Stock Exchange's *Fact Book* provides further details on the KSE.

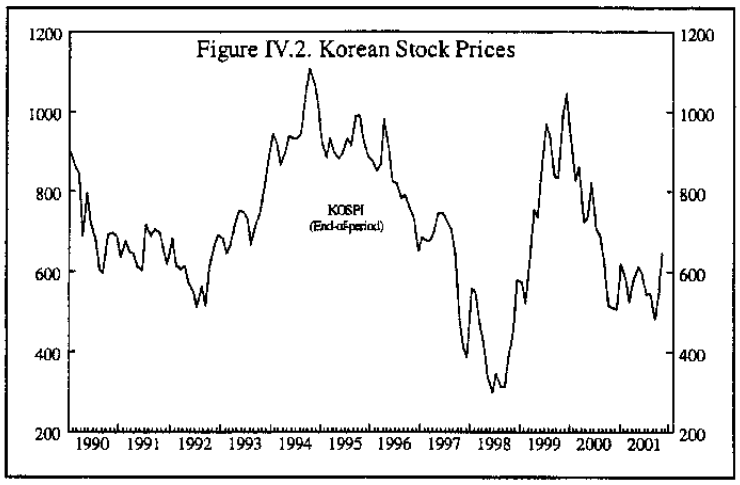
[4] There are a few exceptions, for public corporations and in certain industries (e.g., telecommunications and airlines) where there are limits on aggregate foreign holdings, typically in the range of 33–49 percent.

individual investors is greatest. Day trading is also high by international standards. Indeed, market turnover is dominated by household trading. Although households hold only about 20 percent of KSE stocks, they account for over 70 percent of trading. By contrast, foreign investors' share trading is far smaller (at about 11 percent) than their ownership share.

6. Total annual turnover, at about 230 percent of KSE market capitalization in 2000, is quite high by international standards. Explicit transactions costs are very low in the Korean market, given low brokerage commissions, especially for on-line trading. Implicit transactions costs (which reflect the market impact associated with orders) are also low for the larger stocks, given the high level of turnover and availability of alternative means of transactions via ADRs and GDRs in foreign markets.[5] By one estimate, total trading costs are smaller for large Korean equities than in any other emerging market.[6]

7. Prices in the Korean market saw a healthy recovery in 2001, but on average remain far below precrisis levels (Figure IV.2). Indeed, the Korean market had begun to weaken long before the onset of the Asian crisis. At its post-crisis low in June 1998, the KOSPI index was 75 percent below its late-1994 peak. Prices then picked up significantly in the second half of 1998 and in the technology-led boom of 1999, hitting a peak at the start of January 2000. The global technology shakeout of 2000 then saw the KOSPI fall 51 percent, and the KOSDAQ fall nearly 80 percent. The KOSPI showed little direction through the first eight months of 2001 and fell 12 percent on September 12, the day after the terrorist attacks in the United States. However, a strong rally followed in the last three months of the year, and for the year as a whole the KOSPI and KOSDAQ were each up 37 percent. Both these gains were substantially larger than the average 4 percent gain seen in the MSCI Emerging Asia index.

Figure IV.2. Korean Stock Prices



[5] About 35 Korean companies have some form of ADR or GDR arrangement on U.S. or European markets, though only a small number of these have good liquidity. There are also three closed-end funds traded on U.S. exchanges.

[6] See Salomon Smith Barney, *Emerging Markets Equity Allocator*, January 2002, which estimates the total trading cost for establishing a $2 million position in Korean stocks at 0.22 percent, versus a median of 0.92 percent for 25 other emerging markets.

8. The average profitability of Korean companies remains fairly weak. Although a few companies (e.g., Samsung Electronics, Hyundai Motor and POSCO) are sometimes mentioned by analysts as globally competitive companies, average profitability remains low, due in part to the high interest burden of many Korean companies. Despite substantial corporate and financial restructuring after the 1997 crisis, corporate governance is still perceived to be poor.[7] In particular, there is investor mistrust of the complex cross-holdings of Korean *chaebol*, the poor corporate governance practices of many companies, and the meager dividend payments. This has shown up in a "Korea discount" whereby a higher discount rate (i.e., a lower price-earning ratio) is applied to Korean companies than companies in other advanced Asian economies (Table IV.1).[8]

Table IV.1. Price-Earnings Ratios
(Price/Forecast 2002 Earnings, January 2002)

Korea	10.8
Hong Kong	14.9
Singapore	22.9
MSCI Emerging Markets Asia	18.1
MSCI All Countries	20.1

Source: Morgan Stanley.

C. The Korean Equity Market—Statistical Analysis

Introductory Analysis

9. In this section, the focus is on examining the "where", "when" and "how" of price discovery in the Korean equity market, and the factors that appear to explain short-term price movements. In particular, Korean price changes are regressed on price changes in other national stock markets to explore the extent to which Korean prices appear to be explained by developments in other countries. The analysis begins with regressions of overnight returns, intraday returns, and overall daily returns (i.e., the sum of overnight and intraday returns) on returns in U.S. stock markets and regional stock markets.[9]

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[7] See Chopra et al. (2001) for an outline of corporate and financial sector reforms.

[8] For a foreign investor's view on Korean corporate governance, see the presentation by John Lee on "Scudder's View on Corporate Governance" at www.aicg.org.

[9] Each trading day on the KSE and KOSDAQ markets begins and ends with a batch auction. All orders placed in the automated system between 8 a.m. and 9 a.m. are held and processed in an opening auction that determines opening prices. Similarly, all orders placed between 2:50 p.m. and 3 p.m. are held and processed (along with earlier orders that were placed at "limit or market at close") in a closing auction at 3 p.m. that determines closing prices. Overnight returns are defined as the change between the closing value of the KSE on one day and the opening value on the next day, with intraday returns defined correspondingly.

10. Regressions of overnight Korean returns on overnight U.S. stock returns illustrate the importance of U.S. markets for the Korean market (Table IV.2). A simple regression of the overnight KOSPI return on the previous day's returns on the Dow Jones Industrial index, the S&P500 index, the Nasdaq composite index, and the Philadelphia Semiconductor index[10] shows an adjusted *R*-squared of about 0.56 (i.e., 56 percent of the variance in the overnight KOSPI return is explained by U.S. returns). But overnight returns on other markets in the Asian timezone also have significant explanatory power, with an *R*-squared nearly as high. However, this correlation with other Asian markets appears to largely represent a common response to the previous day's returns in U.S. (and other international) markets. In particular, when both U.S. and Asian timezone returns are included as explanatory variables, the adjusted *R*-squared rises only slightly above the level obtained with only U.S. returns. Still with an *R*-squared of 0.59 from a regression of the overnight KOSPI return on returns in other national markets, it is clear that the overnight return in Korea is very substantially affected by international markets—especially the U.S. equity market.

Table IV.2. Regressions of Korean Returns on Regional and U.S. Returns

	Adjusted R-squared
Kospi overnight change on previous day's US returns	0.555
Kospi overnight change on overnight Asian returns	0.525
Kospi overnight change on US and Asian returns	0.590
Kospi daytime change on previous day's US returns	0.006
Kospi daytime change on daytime Asian returns	0.185
Kospi daytime change on US and Asian returns	0.208
Kospi daily change on previous day's US returns	0.150
Kospi daily change on same day Asian returns	0.283
Kospi daily change on US and Asian returns	0.302

All equations also include day of the week dummies and one period lagged Korean returns.
US returns include the following indices: Dow Jones Industrial, Nasdaq Composite, S&P 500, and Philadelphia Semiconductor.
Asian time-zone returns include the following indices: Topix, Taiwan Stock Exchange, Hang Seng, Straits Times, and All Ordinaries.

11. By contrast, external factors—either U.S. or Asian in origin—explain a far smaller fraction of intraday Korean equity returns. As would be expected, the previous day's U.S. returns have essentially zero explanatory power for intraday Korean returns, with their full impact already felt in opening prices. Intraday returns in other Asian countries have some modest explanatory power for intraday Korean returns, but the adjusted *R*-squared of 0.17

[10] The Philadelphia Semiconductor index is an index of the stock prices of 16 U.S. semiconductor-related companies and is closely watched in Korea given the importance of semiconductors and computer-related stocks in Korea.

suggests that domestic Korean factors and company-specific news instead explains most of the variation in intraday returns.

12. Regressions of daily returns—which are the sum of overnight and intraday returns—provide an overall measure of the importance of external factors. The previous day's returns in the U.S. explain about 15 percent of the variance in daily Korean returns, whereas Asian returns appear to explain a higher proportion (28 percent) of the variance. However, nearly half of this impact would appear to be the indirect impact of U.S. returns. Overall, the previous day's returns in the U.S. and the daily returns in five other Asian countries explain about 30 percent of the variance in daily returns. While this proportion is significant, it still implies a major role for domestic influences (or for global factors that are not captured in the returns indices used as proxies for external factors).[11]

13. The role of domestic factors can be assessed by including some domestic variables in a regression of daily KOSPI returns. Given the large number of possible explanatory variables, a stepwise procedure was followed to determine which variables are most correlated with Korean returns.[12] Variables were added to the equation based on their marginal significance level, with the goal of finding a parsimonious equation with plausible parameter estimates that explained the daily return on the KOSPI.[13] The resulting equation—which should be thought of as a statistical model rather than a behavioral one—was as follows:

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[11] The adjusted *R*-squared of similar regressions using monthly returns is somewhat higher, at about 0.55.

[12] The variables that were tested for inclusion in the equation were as follows: U.S. market returns—the previous day's return on the Dow Jones Industrial index, the Nasdaq Composite index, the S&P500 index, and the Philadelphia Semiconductor stock index, and the change in the yield spread on Korean sovereign bonds (as measured by the JP Morgan EMBI spread); Asian timezone returns—the same day daily return in the Topix index, Hang Seng index, the Straits Times index, the Taiwan Stock Exchange index, and the All Ordinaries index; domestic variables—the change in the three-year government bond yield, the change in the overnight call rate, and the percentage change in the value of the won in Seoul trading. For each of the previous variables, one lagged value was also included. Other control variables include day of the week dummies, and two lags of the returns on the KOSPI and KOSDAQ index.

[13] Given that many of the possible explanatory variables are highly correlated, a stepwise procedure seemed most appropriate to identify those which appear to be most correlated. Such procedures run the risk of "data mining", but in the current case—with sample sizes typically over 600 observations—the risk of spurious correlations seems fairly low.

$$dKOSPI = \underset{(0.5)}{0.0004} + \underset{(4.8)}{0.36} * dStraits\ Times + \underset{(3.7)}{0.24} * dHang\ Seng + \underset{(3.7)}{0.29} * dTopix + \underset{(4.1)}{0.10} * dPhilSemiIndex(-1) - \underset{(3.7)}{0.81} * dWon - \underset{(3.8)}{0.0003} * dBond \quad \text{(IV.1)}$$

Adjusted R-squared= 0.377, Number of observations = 529

where dVariable represents the log differenced change in the variable, with the exception of the domestic bond rate where it represents the basis point change. T-statistics are shown in parentheses, and—by the design at the stepwise regression procedure—all variables are highly significant.

14. The results can be interpreted as follows:

- Two domestic variables are strongly associated with the daily return on the KOSPI. In the case of the exchange rate (defined as won per dollar), the coefficient indicates that a one percentage point appreciation of the won is associated with a 0.81 percentage point increase in the KOSPI. This suggests that flow effects (e.g., foreign purchases leading to increases in stock prices and won appreciation) or common "sentiment effects" are more important in the short-run than any competitiveness effects (whereby export stocks would weaken as the exchange rate appreciated). In the case of the bond market, the coefficient indicates that a 10 basis point fall in yields is associated with a 0.3 percent increase in stock prices. Since foreign investors are not particularly active in the bond market, this is unlikely to be due to flow effects. Instead, it is likely due to common sentiment or required return effects (falls in required rates of return on Korean assets boosting both bond and equity markets). Further, this effect must be more important than any substitution effects (negative correlations from investors switching from one asset to the other) or any effect from monetary policy expectations (whereby increases in stock prices lead to expectations of higher interest rates).

- The four foreign equity indices that are jointly most correlated with the Korean market are the benchmark indices for Singapore, Hong Kong and Japan, as well as the prices of U.S. semiconductor stocks. The fact that broader U.S. indices are not included does not mean that these are not important influences on Korean stock prices, rather that the impact of movements in these broader indices shows up (along with some Asia-specific factors) in correlations with Singapore, Hong Kong and Japanese stock prices. However, given the presence of two major semiconductor manufacturers (Samsung Electronics and Hynix) in the KOSPI, and many other computer related stocks, it is not surprising that U.S. semiconductor stocks also have some additional explanatory power.

D. The Role of Foreign Investors in the Equity Market

Possible Channels of Causation Between Foreign Inflows and Prices

15. In considering the influence of external factors on Korean equity prices, the question arises as to whether net purchases and sales by foreign investors also have an independent impact on equity prices. This might not be surprising in light of evidence (e.g., Tesar and Warner (1994)) from monthly or quarterly data that foreign inflows and domestic equity returns are positively correlated for a range of countries. Indeed, a regression of monthly KOSPI returns on monthly net purchases of KSE stocks by foreigners also indicates significant correlation:[14]

$$DKOSPI = \underset{(1.4)}{-0.026} + \underset{(3.5)}{0.119} * Foreign \qquad \text{(IV.2)}$$

Adjusted R-squared= 0.248, Number of observations = 36

16. The apparent very strong positive correlation between net inflows and Korean returns might reflect a number of different factors:[15]

- Feedback trading. Foreigners might increase their holdings following price increases. In this case, market returns could be driving inflows rather than vice versa, but it might not be possible to identify the exact causality without high frequency data.

- Price pressures from permanent changes in demand. If the demand curve for stocks is downward sloping (rather than flat as traditionally assumed—with prices purely determined by fundamentals and not demand and supply), then foreign inflows represent an outward shift in the demand curve summed over all investors and should result in higher prices. This may be related to what Clark and Berko (1997) call the "base-broadening effect" of higher stock from increasing foreign investor participation in emerging stock markets.[16]

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[14] Here, and for the remainder of the paper, net inflows are measured as a percent of total market capitalization.

[15] For further discussion of different possible explanations of correlations between flows and returns, see e.g., Engel and Lehnert (2000), Clark and Berko (1997), and Sias, Starks and Titman (2001).

[16] For the base broadening effect to explain positive correlation, the price increases that are generally thought to accompany equity market liberalization would have to occur at least partly through the process of increased ownership, rather than occurring immediately at the time of liberalization.

- Temporary price pressures. If there is temporary illiquidity in the market that results in a temporarily-downward-sloping demand curve, purchases by foreign investors may drive up prices in the short run. However, once portfolios of other investors have readjusted, initial price effects might be reversed. In this case, the correlation between flows and returns would decline as the horizon of the return measurement period increased.

- Information revelation. If foreigners have more information relevant to the pricing of domestic assets than domestic investors, this information may be revealed through their trading and contribute to price determination.[17] In this case the correlation between inflows and returns would reflect the market reacting to the information held by foreign investors.

- Omitted variables. Net inflows and price increases could both be responding to some other variables, and the positive correlation might be due to a failure to control for these variables.

17. Fortunately, detailed Korean trading data are available and allow analysis of the relationship between net inflows and returns to shed light on the relative importance of the above factors. In particular, foreign investors must register with the Financial Supervisory Service, a requirement that originated due to the earlier limits on foreign holdings of Korean equities. Indeed, for each equity trade, the investor group (foreign or domestic, with domestic divided up into seven categories) of the buyer and seller is recorded by the Korea Stock Exchange. Hence Korea has a rich database for exploring the impact of trading by different groups on market prices, and data are available at daily (or even higher) frequency, allowing quite precise tests of some of the possible explanations above.[18] Accordingly, daily data are used in the remainder of this section to examine both the factors that influence foreign inflows and their impact on Korean asset prices. It is noteworthy that this data captures the trading of all foreign investors, as opposed to the data used in some previous studies which includes only one class of investors (e.g., only U.S. investors, or only mutual funds).[19]

18. A simple way to begin the analysis of the role of foreign investors would be to compare average KOSPI returns on days when foreigners were net buyers and on days when

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[17] Alternatively, the model of Brennan and Cao (1997) would suggest that under certain circumstances positive correlation between flows and returns could result from foreigners being *less* informed than domestic investors.

[18] See Cho, Kho and Stulz (1999, 2001) and Kim and Wei (2001) for other empirical work using the KSE data at the individual stock level.

[19] See, for example, Kaminsky et al. (2000) and Borensztein and Gelos (2000) for studies of mutual fund portfolio behavior in emerging markets.

they were net sellers. Sorting the data from January 1999 to November 2000 reveals large differences in returns in these two groups of days. In particular, days when foreigners are net purchasers have average daily returns of 0.56 percent, and days of net foreign sales have average returns of -0.81 percent. The difference between these is strongly statistically significant.[20] Furthermore, a regression of returns on net inflows (as a fraction of market capitalization) yields a regression coefficient with a *t*-statistic of 9.8. This correlation would appear to be far stronger than any previous empirical evidence on the relationship between returns and the net purchases of any particular investor group.

19. However, net inflows into Korea are also strongly correlated with returns in other Asian markets. For example, regressions of returns in Tokyo, Hong Kong, Singapore, Sydney, and Taipei on Korean net inflows with regression *t*-statistics ranging from 4.8 to 7.5. The reason is presumably not due to any causal influence from net flows into Korea, but instead because Korean inflows are correlated with the previous night's return on benchmark U.S. indices (with *t*-statistics around 10) and Asian markets also respond to the previous day's U.S. return. This suggests that a simple correlation between net foreign purchases and Korean returns may overstate the true impact of flows on prices. This highlights the need to (i) understand what drives net inflows into Korea; and (ii) control for other influences on Korean stock prices.

What Explains Foreign Inflows?

20. Daily data allow a precise analysis of the determinants of foreign inflows. In particular, if net purchases by foreigners (or any other group of investors) respond systematically to recent returns, daily data should be able to capture these linkages.[21] Of course, nonresidents are not the only participants in the Korean market and if one finds that foreigners typically are buyers following a certain type of information then it follows that domestic residents in aggregate must be sellers in response to the same information. Accordingly, it will only be possible to identify which of the two groups has the dominant role in responding to the information if the trading behavior is accompanied by price effects.

21. Correlations between net purchases of different investor groups may give some preliminary information about the trading behavior of different groups. Although the "adding-up constraint" implies a perfect negative correlation between any group's net purchases and the net purchases of the rest of the market as a group, it is possible that the net

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[20]These differences are made more stark when viewed in annualized terms, of about 300 percent on net inflow days and -85 percent on net outflow days.

[21] By contrast, much of the previous work analyzing the linkages between investor flows and equity prices—most notably the U.S. literature on institutional investor purchases and flows into mutual funds—has used monthly or quarterly data, which does not adequately allow one to assess if returns cause flows or vice versa.

purchases of individual subgroups could actually be positively correlated if they share similar trading patterns. In the case of Korea, the net purchases of retail investors (which account for 74 percent of all trading in the sample period) are indeed negatively correlated with net purchases by foreigners and by domestic institutions. However, the net purchases of the latter two groups are also negatively correlated, indicating that there is no close correspondence between their trading patterns.

22. To better understand the trading patterns of foreigners and the two domestic investor groups, data on daily net purchases as a percent of market capitalization were regressed on returns on a range of different assets over the previous two days. Since net purchases are highly autocorrelated, lagged value of net purchases were also included as potential regressors. Again, a stepwise regression procedure was used to arrive at parsimonious regressions that appear to characterize trading behavior. The results are shown in Table IV.3.

Table IV.3. What Drives Net Purchases?

Explanatory Variables	Net Purchases of		
	Foreigners	Domestic Institutions	Domestic Households
Lagged net purchases (t-1)	0.232	0.157	0.226
	(6.3)	(3.9)	(5.8)
Lagged net purchases (t-2)	0.120	0.098	
	(3.7)	(2.5)	
Lagged KOSPI return (t-1)	0.281		-0.23
	(3.8)		(2.6)
Lagged U.S. returns	dNasdaq (-1)	dNasdaq (-1)	dPhil. Semic. (-1)
	0.321	-0.27	-0.247
	(3.1)	(3.6)	(3.7)
	dPhil. Semic. (-1)	dDow (-2)	dS&P500 (-1)
	0.348	0.451	-0.407
	(5.1)	(3.0)	(2.1)
			dS&P500 (-2)
			-0.741
			(4.7)
Lagged regional returns	dHang Seng (-1)		
	0.334		
	(3.4)		
Other variables			
Adjusted R-squared	0.412	0.065	0.224
Number of observations	580	587	587

Regressors shown are those that were found to be significant in a stepwise regression including a wide range of variables proxying country, regional, or US returns, as well as day-of-the-week dummies and lagged dependent variables. Constant terms not shown for brevity

23. The results of the flows regressions indicate that the net purchases of foreign investors can be well explained by just a few variables. A regression on net purchases on the two previous days yields an adjusted *R*-squared of about 0.17, illustrating the (positive) autocorrelation in net flows. However, flows also appear to respond positively to overnight returns in U.S. equity markets (especially in the Nasdaq and Philadelphia Semiconductor indices) and to the previous day's returns in domestic and regional markets (proxied by the KOSPI and Hang Seng indices). The adjusted *R*-squared of this augmented equation is a remarkable 0.41, and the correlations with all the returns variables are positive. Hence there is strong evidence that foreign investors have been "positive feedback" or momentum investors at the aggregate level, tending to buy immediately following good news in Korean, regional, and U.S. markets.[22]

24. The regressions for net purchases of Korean households and institutions also show some significant responses to the previous day's returns. Not surprisingly—given the adding up constraint—net purchases by households show the opposite tendency to foreign flows. Households tend to be net sellers in response to price increases on the previous day in Korea or the United States. There is also evidence that they tend to continue to sell on the second day after U.S. price increases. Thus, their trading pattern can be characterized as contrarian with respect to short-run returns. The equation for net purchases by institutional investors shows a much lower degree of explanatory power than the other two groups, but suggests that institutions tend to sell (by implication to foreigners) following price increases in the U.S. market on the previous day, but to buy (by implication from households) following U.S. increases two days earlier.

25. The above results appear consistent with research into other markets. For example, Grinblatt and Keloharju (2000) find that foreign investors and sophisticated domestic institutional investors tend to be momentum investors in the Finnish market, whereas households and less sophisticated institutions tend to contrarians. Similarly, Bae, Ito and Yamada (2001) show using weekly data that foreign investors in the Japanese market can be characterized as momentum players while domestic investors are contrarians. And Goetzmann and Massa (1999) provide evidence on U.S. mutual find investors that contrarian traders tend to trade more frequently than momentum traders (consistent with evidence that Korean households trade far more actively than foreigners).

The Price Impact of Foreign Flows

26. To assess the price impact—if any—of foreign flows, net purchases by foreigners (as a percent of total market capitalization) are included as an additional regressor to the KOSPI equation shown above in paragraph 13. The resulting equation is as follows:

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[22] Positive net purchases following increases in foreign stock prices could, however, also be consistent with a simple portfolio model where the increase in the value of one asset changes portfolio weights and induces purchases of the other asset (see Schinasi and Smith (2001).

$$dKOSPI = \underset{(1.4)}{-0.0012} + \underset{(4.8)}{0.35} * dStraitsTimes + \underset{(3.4)}{0.22} * dHang\,Seng + \underset{(3.8)}{0.29} * dTopix$$
$$+ \underset{(2.6)}{0.07} * dPhilSemiIndex(-1) - \underset{(3.3)}{0.72} * dWon - \underset{(3.6)}{0.0003} * dBond + \underset{(3.8)}{0.072} * Foreign \qquad \text{(IV.3)}$$

Adjusted R-squared = 0.393, Number of observations = 529.

27. The foreign flows variable is highly significant, and its coefficient implies that net purchases equivalent to one percent of market capitalization would be associated with an increase of 7 percent to the KOSPI. It is noteworthy that this is a substantially smaller increase than the 18 percent increase that would be suggested by a regression of daily KOSPI returns on net purchases with no other explanatory variables.[23] Given that flows are driven partly by foreign returns, this indicates that foreign stock returns have both a direct impact on domestic returns and an indirect one (via flows).

28. The price impact of net purchases by Korean households and institutions can also be examined by including their net purchases in separate regressions of KOSPI returns. The regression coefficient for institutions indicates that net purchases equivalent to 1 percent of market capitalization are associated with a 5 percent increase in the KOSPI (with a t-statistic of 3.0). By contrast, the regression coefficient for households indicates that net purchases equivalent to 1 percent of market capitalization are associated with a 10 percent *fall* in the KOSPI (t-statistic of 6.4).

29. The adding-up constraint implies that if net purchases of some groups are associated with price increases, then net sales by other groups must not have a countervailing impact. As discussed by Zheng (1999), if net purchases by one group and net sales by another are associated with price increases, then it is reasonable to conclude that the former group is tending to initiate the trades by shifting its demand curve, whereas the latter group is more passively responding by shifting along its demand curve. In the Korean case, it appears that

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[23] Given that flows have positive autocorrelation, it follows that a boost to inflows on one day is associated with further inflows on subsequent days. However, to the extent that flows are somewhat predictable, it should only be the surprise or unexpected component of flows that impacts upon prices, with the expected component having no impact (see Warther (1995)). To test this, a series for "expected" foreign flows on day t was constructed based on a regression similar to that in Table IV.3, but using only variables predetermined at the end of Korean trading on day t-1. Unexpected flows were then derived as actual flows less expected flows. When net foreign inflows are decomposed in this way and added to the equation in paragraph 13, the coefficient on unexpected flows is 0.11 and highly significant (t-statistic of 4.6) while the coefficient on expected flows is approximately zero and insignificant. Thus, as expected the coefficient on surprise inflows is larger than the coefficient on total flows, corresponding to a price impact of 11 percent for a surprise inflow equivalent to 1 percent of market capitalization.

net purchases by foreigners (and institutions to a lesser extent) are associated with price increases, but—somewhat counterintuitively—that net *sales* by households are associated with price increases. Hence, from the price activity that accompanies their flows, we might conclude that it is the foreign investors rather than the household investors that have an impact on prices in Korea through their trading. Further, based on the earlier regressions looking at the determinants of flows, it would seem that the feedback tendencies observed with respect to the previous day's price movements are more a reflection of active momentum investing by foreigners and that the apparent contrarian investing by Korean households is somewhat more passive.[24]

30. However, it is possible that price changes seen on the day of changes in foreign flows might be temporary. Alternatively, Froot *et al.* (2001) suggest that foreign investor flows may have further ongoing impacts on prices for a month or more. A number of different regressions were run to shed light on this, with little evidence from daily data to suggest either price reversals or continuations. Further, regressions using weekly data also show no impact on prices beyond the week of the flows, suggesting that price impacts are reasonably permanent but that flows do not have ongoing impact on prices.

Summing up and a Comparison with Results for Other Asian Countries

31. Based on the above results, some tentative conclusions might be reached about the factors that might possibly explain the correlation of returns and inflows:

- Given the strong evidence that daily flows are positively correlated with the previous day's returns in Korea and regional and U.S. markets, part of the correlation that is observed in lower frequency (e.g., monthly data) is presumably from feedback trading. Such feedback trading is consistent with the notion that investment in Korea over this period has tended to occur when risk tolerance is increasing and foreign investors are feeling optimistic, perhaps due to wealth effects. In some senses, foreign investment in Korea may have been viewed as a cyclical or high-beta play.[25] The possibility that the same-day correlation between returns and inflows could partly reflect intraday feedback trading has not been explicitly tested. However, this seems to be unlikely as many of the trading decisions of foreign investors are likely to have been made in their home markets the previous day. Further, if there is intraday

[24] Grinblatt and Keloharju (2000, p. 66) suggest that the contrarian trading behavior of unsophisticated Finnish investors (especially households) may be due to their being "overly eager to cash out on winning stocks or to buy losing stocks."

[25] This would be consistent with data for Korea's beta with respect to the world market return. For example, Salomon Smith Barney's *Emerging Markets Equity Allocator*, January 2002, estimates Korea's beta at 2.2, the second highest in their sample of 26 emerging markets.

feedback trading it presumably occurs mostly after the opening batch auction. Yet regressions of overnight returns (not shown here) indicate that daily net purchases by foreigners are indeed significant explanators of returns in the opening batch auction. This indicates that at least a significant portion of the daily correlation between returns and flows is unlikely to be due to intraday feedback trading.[26]

- The analysis with daily data (and indeed with monthly data) indicates that the simple bivariate correlation is substantially reduced after controlling for information in other equity markets or in other Korean asset classes. Indeed, the possibility that the price impact of flows might be further reduced if additional control variables were available—e.g., for specific corporate news—cannot be ruled out.

- Analysis with daily and weekly data provides no evidence to support the notion that the observed price impact is temporary due to price pressures that are subsequently unwound. However, if reversals occur very slowly over an extended period of time, they are unlikely to be captured by regressions using daily or even weekly data, so some unwinding of price pressures cannot be ruled out.

- The regressions above have provided no particular test of the notion that the positive correlation between inflows and returns reflects superior information of foreigners that is revealed through the trading of foreign investors and reflected in prices. However, this seems unlikely, given the strong evidence in Choe *et al.* (2001) that the stock-level trading of foreign investors yields no evidence of them having an informational advantage over domestic investors.

- This leaves increased demand associated with foreign inflows as the most likely candidate for explaining the price impact of trading that remains after controlling for other information. This is consistent with the substantial literature that prices rise due to increased demand when stocks are included in indices that are widely used as benchmarks for index funds (see, e.g., Morck and Yang (2001)). Interestingly, the estimated price impact for Korea (7 percent for inflows equivalent to one percent of market capitalization, or 11 percent for unexpected inflows) is quite similar to the results of Clark and Berko (1997) who find an impact of 8 percent for surprise inflows into Mexico using monthly data which they attribute also to increased demand (or base broadening). By contrast, both estimates are far lower than the average 40 percent impact for emerging markets suggested by Froot et al. (2001),

[26] About 8–10 percent of daily trading occurs in the opening auction. Some feedback trading cannot be ruled out in this auction as the total buy and sell orders are known to investors in the lead-up to the opening auction.

whose surprisingly high estimate may be due in part to the failure to account for other variables (e.g., U.S. or regional stock market returns) that are correlated with flows and domestic returns.[27]

32. However, the overall return performance of the Korean equity market over the sample period would suggest only a very modest price impact from foreign inflows. In particular, total daily net inflows in this period were equivalent to about 8 percentage points of KSE market capitalization. Yet Korean stock prices grew by only about 10 percent over the sample period, little different to or only modestly stronger than price growth in major U.S. and regional indices. Hence, the overall price performance of the Korean market is difficult to reconcile with the observed net foreign inflows and global market trends, unless the price impact of net inflows is no more than about one or two percent per percentage point of market capitalization. The price impact that is obtained from monthly regressions is admitted closer to this than the price impact from daily or weekly data (5 percent versus 7–9 percent). Still, the magnitude of the price impact remains something of an open question, and is addressed further using vector autoregression analysis in Richards (2002).

33. Since detailed investor data are available for a number of other regional markets, it is of interest to ask if the results from Korea are also seen in those markets. Accordingly, similar analysis was applied to daily foreign inflows data for Thailand, the Philippines, Indonesia and Taiwan Province of China. It is noteworthy, however, that net foreign purchases and sales are typically somewhat smaller in these four other markets than in Korea.

34. The analysis for these other countries indicates that most of the Korean results are indeed also observed in these other markets.

- Net inflows are positively autocorrelated, and also positively correlated with the previous day's local market return and with recent returns in either the U.S. market or major regional markets (notably Singapore). In the case of Thailand, where data for domestic investors are separated into household and institutional investors, household investors are contrarian with respect to recent returns—as in Korea—while institutions are difficult to categorize.

- Similarly, the correlation between daily net inflows and daily returns is significant , but falls once control variables such as returns on regional or U.S. markets are added. Nonetheless, net inflows (both total and unexpected) are significantly correlated with returns, with regression coefficients that are similar or larger than the estimates for

[27] The Froot et. al (2001) results are also far higher than the estimates in Dahlquist and Robertson (2001) which would appear to imply a price impact of 3.4 percent for inflows into Sweden.

Korea.[28] There is again no evidence of reversals, but some evidence for flows to be associated with continued (modest) increases in prices in the week after they occur. As is the case with Korea, estimates of the price impact tend to increase when moving from daily to weekly data, but fall when monthly data are used. Overall, increased demand seems to remain the most likely candidate for the observed correlations.[29]

E. The Currency Market

Background

35. The exchange rate for the won is freely floating, with minimal intervention by the Bank of Korea. Until late 1997, there were limits on the daily movement in the value of the currency, but these were abolished as part of the liberalization of financial markets in response to the crisis. At its lowest point of W 1,810 per dollar at the start of early 1998, the won had depreciated more than 50 percent from its precrisis level. However, as the economy recovered the won appreciated fairly steadily against the dollar, reaching a peak at W 1,104 per dollar in early September 2000. Since then the exchange rate has weakened somewhat. The currency traded around W 1,300 for much of 2001, with periods of weakness coinciding with depreciations of the Japanese yen and periods of strength corresponding to strong inflows into the equity market.

Table IV.4. Foreign Exchange Turnover
(Average of daily spot transactions, billions of U.S. dollars)

	Won	Global Trading, all Currencies
1995	4.3	494
1996	4.1	n.a.
1997	5.6	n.a.
1998	2.8	568
1999	4.3	n.a.
2000	5.5	n.a.
Est. 2001	6.3	387

Won data are daily averages for the full year from the Bank of Korea.
Global data are daily averages for April from the BIS.

36. Currency trading in the Seoul market is primarily through two interbank brokers between the hours of 9:30 a.m. and 4:30 p.m., although there is also some OTC trading during this period, as well as before and after the period in which the brokers operate. The vast majority of trading occurs in the Seoul market, with little trading elsewhere in the region or overnight in London or New York. The modest amount of trading that does occur in these latter markets is mainly in the form of nondeliverable forward contracts (i.e., contracts with payouts based on the future value of the won, settled in dollars).

[28] The one exception to the finding that foreign inflows are associated with price increases appears to be the KOSDAQ market.

[29] See Richards (2002) for more details of the analysis for these three countries, and the relationship between price impacts estimated using data of different frequency.

37. The 2001 triennial Survey of Foreign Exchange Activity trading indicated that the won was the 15th most traded currency in April 2001, accounting for 0.4 percent of global turnover, up from 0.2 percent in 1998. After a sharp fall in trading volumes during the 1997–98 crisis, trading has now recovered to above its precrisis level, even though global foreign exchange trading has contracted over the same period (Table IV.4). Despite its recent growth, the market for the won is still relatively undeveloped—certainly compared with the size of the economy, the 13th largest in the world.

Statistical Analysis

38. The volatility of the won is relatively low by international standards. The standard deviation of daily price changes has been about 0.42 percent over the last three years, with no obvious trend. A preliminary sense of where price determination takes place in the won can be obtained by examining the relative variability of intraday and overnight changes. These indicate that the majority of price discovery takes place in the seven hours of Seoul trading (9:30 a.m. to 4:30 p.m.) rather than in the 17-hour "offshore" period. (A closer examination of the data also reveals some significant negative correlation between the overnight change and the subsequent intraday change—this will be addressed below). That is, most price discovery takes place during the hours that the home market is open. By contrast, price discovery in more globally traded currencies occurs at a fairly constant rate around the clock and a deep liquid market exists throughout the 24-hour trading day.

39. As was done for the equity returns data, stepwise regressions are used to examine the factors that appear to be associated with changes in the value of the won.[30] The regression that is obtained is as follows:

$$\begin{aligned} dWon = {} & 0.0004 + \underset{(2.6)}{0.18}\,dYen - \underset{(4.1)}{0.03} * dKOSPI - \underset{(3.4)}{0.03} * dHangSeng - \\ & \underset{(2.2)}{0.01} * dPhilSemiIndex(-1) - \underset{(2.7)}{0.01} * Foreign + \underset{(2.5)}{0.00004} * dBond - \underset{(2.8)}{0.001} * Tues \end{aligned} \qquad \text{(IV.4)}$$

Adjusted R-squared = 0.247, Number of observations = 603.

40. The regression indicates that about one quarter of the variance of the daily exchange rate can be explained by just a few domestic and foreign financial variables. Indeed the explanatory power is perhaps surprisingly high given the notoriously poor fit of monthly or quarterly exchange rate equations using macroeconomic variables. The coefficients can be interpreted as follows:

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[30] The candidate variables include domestic variables (changes in the three-year bond yield and overnight call rate), domestic and foreign stock market movements, net foreign inflows into the KSE, changes in the value of the yen and euro against the dollar, and day of the week dummies.

- The daily movement of the won against the dollar in Seoul is significantly correlated with the daily movement of the yen against the dollar in Tokyo. (By contrast, the correlation with the euro is much smaller and not statistically significant.) Over the full 1999–2001 sample, a one percent appreciation of the yen is associated with an appreciation of the won against the dollar of 0.18 percent. A slightly larger elasticity (0.23) is obtained from regressions using weekly changes. There is also some evidence that this elasticity has risen over time, to about 0.45 based on data just for 2001. Still, it is also worth noting that correlations of less than 0.5 imply that the won moves more in line with the dollar than with the yen. Indeed, the standard deviation of the won-dollar rate is lower than that of the won-yen rate.[31]

- Appreciations of the won are associated with positive returns on Korean, regional and (especially technology-related) U.S. markets. This is something of a puzzle, since theory provides no guidance why a currency's movement should be correlated with global stock returns, and clearly not all currencies can be positively correlated with global returns. Still, the finding that the Korean currency appreciates at times when global stock prices are rising suggests some link between investment in the won and the risk appetite of international investors. The won in some ways may be viewed as a high-beta, or cyclical rather than defensive asset.

- The won also tends to appreciate on days of net purchases by foreigners on the KSE. This correlation presumably reflects both flow effects (foreign investors buying won for equity purchases) as well as more general sentiment effects involving both domestic and foreign investors.

- Appreciations of the won are also associated with falls in bond yields. Given that nonresidents are not particularly active in the domestic bond market, this is likely to reflect common sentiment effects rather than flow effects.

41. The coefficient on the yen variable is of interest in light of the weakening of the yen in late 2001 and market expectations that it may weaken further. The elasticities obtained above—0.20 to 0.45—are generally larger than the direct share of Japan in Korea's imports and exports (about 0.16). Thus, they are somewhat larger than would be implied if the Korean exchange rate moved simply to hold constant the nominal trade-weighted effective rate following movements in the yen exchange rate. However, other Asian countries may also tend to depreciate in cases of yen weakness, and an elasticity in the estimated range from market driven movements would not seem implausible as a rough measure of how much the

[31] Elasticities of 0.20–0.45 are lower than the unit elasticity that market participants have sometimes spoken of. The estimated elasticities seem more plausible as measures of the longer-run average correlation. Indeed, it is not uncommon to see temporarily high correlations between relatively different countries, which market participants rely on as rules-of-thumb until the correlations break down entirely.

Korean exchange rate would have to move to maintain an unchanged effective exchange rate in the face of yen weakness (against the dollar and euro) that was also accompanied by some degree of depreciation of other Asian currencies.

42. Regressions of overnight and intraday changes in the won provide some further information on its response to information. Not surprisingly—and providing some confirmation that the correlations are not spurious—the correlations with the yen and the KOSPI are also seen with respect to their respective overnight and intraday movements. By contrast, the impact of U.S. stock prices is—as expected—fully reflected in the overnight won movement. Interestingly, the impact of foreign inflows is seen mainly on the overnight return, which suggests that orders for won to fund purchases of Korean stocks are placed overnight, or within the first half hour of KSE trading, which is further evidence that the correlation between foreign inflows and the KOSPI is due in large part to price pressures and not intraday feedback trading. Interestingly, the residual from the overnight equation adds significant explanatory power (with a *t*-statistic of 8.7) to the regression of the intraday exchange rate change, with a negative sign. This may be consistent with exchange rate movements in the illiquid overnight ndf market being partly reversed once liquidity is restored in the more liquid Seoul daytime market.

F. External Debt

Background

43. The April 2003 and April 2008 global bonds issued by the Republic of Korea in April 1998 are the benchmark external securities for Korea. In addition, there is also substantial external issuance by quasi-government institutions (especially the Korea Development Bank), and some issuance by banks and corporations. The sovereign global bonds are included in JPMorgan Chase's EMBI Plus index and represent about 3 percent of the index. An additional six KDB issues, two Export Import Bank issues, and one Hanvit Bank issue qualify for inclusion in the broader EMBI Global index, and Korean issues account for 5.6 percent of the market capitalization of that index.

44. Korea's sovereign rating has been gradually upgraded since the crisis. After savage cuts to its precrisis investment grade rating (AA- from Standard and Poor's and A1 from Moody's), Korea was upgraded back to investment grade in February 1999 by the two major agencies. Subsequent upgrades (most recently by Standard and Poor's in November 2001) have seen its sovereign rating rise to BBB+ (Standard and Poor's) and Baa2 (Moody's). As such, Korea is one of the highest rated emerging market countries. The analysis that follows focuses on period following the upgrade back to investment grade status in February 1999, during which there has been a substantial fall in Korea's sovereign spread.

Statistical Analysis

45. As in the earlier sections, a stepwise regression technique was used to identify factors that are correlated with the change in Korea's sovereign spread, as measured by the spread on the Korean EMBI+ index subcomponent in basis points.[32] [33] Since one of the explanatory variables—the change in the yield spread on U.S. corporate debt may be subject to measurement error due to illiquidity, the regressions use returns measured over a five-day interval.[34] The resulting regression was as follows:

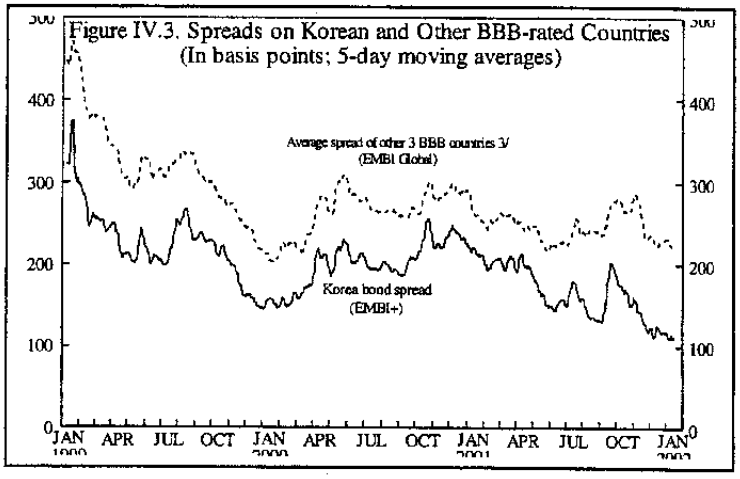
$$d5EMBI(Korea) = \underset{}{-0.32} + \underset{(6.9)}{0.43} * d5EMBI(BBB) + \underset{(3.4)}{0.06} * d5EMBI(Total)$$
$$+ \underset{(3.9)}{0.08} * d5ThreeYrBond - \underset{(5.0)}{1.23} * d5Dow - \underset{(3.0)}{0.59} * d5StraitsTimes \qquad \text{(IV.5)}$$

Adjusted R-squared=0.430 Number of observations = 571

46. The equation explains nearly half of the variance in weekly changes in Korea's sovereign spreads. The coefficients can be interpreted as follows:

- Not surprisingly, the Korean sovereign spread is substantially correlated with spreads on other BBB-rated countries, which alone explain nearly 30 percent of the variance in Korea's spread

Figure IV.3. Spreads on Korean and Other BBB-rated Countries
(In basis points; 5-day moving averages)



[32] The spreads for the EMBI components (and the U.S. corporate debt variables) are defined as the yield on the securities less the yield on U.S treasury securities of comparable maturities.

[33] The variables included as potential regressors included: changes in the average sovereign spread for other BBB rated countries (an average of EMBI global spreads for Malaysia, Poland and South Africa) and in the overall EMBI+ spread; changes in U.S. corporate spreads on BBB and BB rated bonds; the change in the three-year government bond yield in Korea and in the overnight call rate; the percentage change in the won exchange rate; net purchases by foreigners on the KSE over the five day period; and equity returns in Korean, regional and U.S. stock markets.

[34] T-statistics are based on Newey-West standard errors to take account of the moving average error term from using overlapping five-day return observations.

(see also Figure IV.3). The spread on the overall EMBI is less correlated with Korean spreads but adds some marginal explanatory power to the equation. The much higher correlation with other higher-rated emerging markets is not surprising, and indeed Korea has been viewed as something of a safe-haven in emerging bond markets at times of weakness in countries like Turkey and Argentina, which have few economic links with Korea.

- Changes in the external spread are positively correlated with changes in the yield on the Korean three-year domestic bond. This might reflect common sentiment effects yields in the two related asset classes. Alternatively, the correlation may reflect a linkage between the two yields through the use of asset swaps by some investors.

- Falls in the Korean sovereign spread are associated with increases in U.S. and regional equity prices. This linkage is not entirely surprising given the strong correlation seen—especially in 2000—between prices on the Nasdaq (and other equity markets) and prices of emerging markets debt. Again, this is further evidence that Korean assets have been viewed as cyclical assets, tending to do better at times when the risk appetite of global investors is rising.

G. Conclusion

47. This paper has provided a broadly consistent picture of Korean assets being strongly influenced by regional and global factors. For equities this is hardly surprising. What is more surprising, however, is that movements in equity prices in the United States and in regional financial centres appear to affect the value of the Korean won and Korea's external dollar-denominated bonds. Indeed, although the regressions for each of the three asset classes—equities, the won, and the dollar bonds—reveal significant correlations with other Korean assets, most of the explanatory power comes from external variables. In part this may reflect the limited number of proxies included for domestic factors, and no doubt a substantial amount of the remaining unexplained variance could be explained by domestic factors if one could identify and include high frequency measures of corporate profitability and domestic economic and political conditions. Still it seems clear that external factors play a very substantial role in the determination of Korean asset prices. In addition, the net flows of foreign investors appear also to have a significant impact on the equity and currency markets.

48. One interpretation would be that the Korean assets examined here—equities, the won, and Korea's external sovereign debt—are all viewed as cyclical or high beta plays, with prices that tend to rise with increases in regional or U.S. asset prices, which are proxies for global and regional economic conditions and the risk appetite of international investors. These correlations work in Korea's favor at times of global expansions, but would be less favorable at times of global contractions or global falls in asset prices. Yet the Korean economy and Korean asset prices have performed relatively well in the current global slowdown. The equity market was one of the strongest in the world in 2001, the exchange

rate strengthened modestly in effective terms, the sovereign spread fell significantly, and net inflows from foreign investors have remained positive. This suggests that the structural reform since the crisis and the strong macroeconomic fundamentals have partly offset or even dominated any impact from weakness in global or regional asset prices. They provide evidence to other middle income and emerging market economies that strong linkages with global financial markets need not be destabilizing if the domestic economy and macroeconomic policies are sound.

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V. Firm Level Analysis of the Korean Corporate Sector: 1996–2000[1]

Previous analyses of the Korean corporate sector have relied mainly on summary statistics to identify broad trends in profitability and capital structure since the crisis. This paper uses firm-level data, drawn from financial statements of 452 companies over a five-year period (1996–2000), to examine the determinants of corporate performance and the changes in the way that markets valued firms since the crisis. A key finding is that despite the improvement in operating performance, overall profitability remained weak because of the large interest burden on debt. Further, the gap between good and bad performers has widened. Markets also changed their perception of the large chaebol after the crisis, assigning lower valuations and higher borrowing charges compared to non-chaebol firms. The concentrated ownership structure of the chaebol was also found to be negatively related to profitability and market valuation.

A. Introduction

1. Since 1997, progress has been made in restructuring the corporate sector: debt-equity ratios have come down from dangerously high levels; the strong recovery has helped to boost cash flow; a number of large distressed groups have either been dismantled or sold; and financial reporting and disclosure have improved. In addition, market discipline now plays a greater role with the emergence of healthier banks after restructuring, greater shareholder activism, and rising foreign investment. Yet, despite these achievements, the corporate sector continues to suffer from high leverage and poor profitability, and the gap between the good and bad performers has widened, indicating that much more restructuring is needed.

2. This paper examines the underlying determinants of corporate performance since the crisis. Previous analyses have relied mainly on summary statistics to identify broad trends in profitability and the capital structure of Korean firms. With almost five years having passed since the crisis, enough time-series data are now available to begin analyzing the factors behind these changes both across time and across firms. The paper uses firm-level data spanning the pre- and post-crisis periods to examine the factors behind changes in corporate structure and profitability. It also looks at how markets valued companies after the crisis, in particular for the Korean *chaebol*.

B. Data

3. The data used in this analysis comes from the financial statements of Korean listed firms (from Datastream) and includes information on balance sheets, income, cash flow, and retained earnings. To cover both the pre-crisis and post-crisis periods, a five-year (1996–2000) panel data set of various financial indicators was constructed. The size of the dataset

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[1] This paper was prepared by Sungbin Cho (Summer Intern, APD) and Kenneth H. Kang (APD).

varies across years and excludes financial firms. Dropping firms that have missing years provides 452 firms in a consistent data set. Firms are categorized by industry according to the Bank of Korea (BOK) industry classification system. In addition, affiliates of the top-30 *chaebol* as determined annually by the Korea Fair Trade Commission (FTC) are identified as *chaebol* affiliated companies. Specifically, among the 452 firms, 97 are identified as *chaebol* affiliated, and they are typically larger than the non-*chaebol* firms.

4. One important caveat is that the data set reflects "survivorship" bias as it features only those companies that remained listed and operational during the entire period being examined. Those companies that were removed from the sample typically included firms that fell into bankruptcy, entered workout programs, or were delisted because they failed to meet the listing requirements. However, focusing only on the "survivors" allows a consistent comparison of the performance of companies before and after the crisis.[2]

5. The remainder of the paper is organized as follows: Section C examines the trends in corporate performance over the five year period, focusing on capital structure, profitability, productivity, and market valuation. Section D looks at the special features of the *chaebol* structure that have been criticized for causing the financial crisis and the research linking weak corporate governance to the sector's poor performance. Section E outlines the results of the regression analysis looking at the determinants of corporate profitability and market valuation. Section F concludes with some interpretation of the results and their implications for the *chaebol* structure.

C. Corporate Performance During 1996–2000

6. Two key findings emerge from this analysis. First, despite an improvement in operating performance since the crisis, overall profitability remained weak because of the large interest burden on debt. Although firms managed to lower their debt-equity ratios, this deleveraging was achieved through the issuance of new equity rather than actual debt reduction, and the burden of servicing this large debt cut deeply into earnings.

7. Second, market perception of the *chaebol* appeared to have changed after the crisis. Although *chaebol* started with weaker balance sheets, poorer operating performance, and lower returns than non-*chaebol* firms, they paid lower borrowing charges and received higher valuations suggesting that markets were not paying attention to corporate fundamentals or that they considered the *chaebol* "too big to fail." However, this perception changed after the crisis as the *chaebol* premium quickly turned into a steep discount. The following sections describe these changes in corporate performance since the crisis as well as possible reasons for the negative change in market perception of the *chaebol*.

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[2] The dataset also avoids having to account for the impact of changes in the institutional setting, such as for companies entering court receivership or out-of-court workout programs.

Table V.1 Korea: Leverage and Debt Structure, 1996-2000
(in percent)

	1996	1997	1998	1999	2000
1. Leverage					
Debt-equity ratio	245.3	335.5	284.6	164.1	174.8
Chaebol	325	444	344	178	209
Non-*chaebol*	170	232	219	145	137
2. Debt Structure					
Short-term borrowing / Total debt	31.7	32.1	29.0	24.5	28.2
Chaebol	33.2	33.3	29.5	25.3	31.1
Non-*chaebol*	28.9	29.7	28.3	23.1	23.4
ST borrowing and current maturities / Total debt	42.1	41.8	39.6	38.3	43.1
Memorandum items: (in trillions of won)					
Stock of debt	182.5	251.0	252.5	237.8	235.2
Book value of equity	74.4	74.8	88.7	144.0	134.5

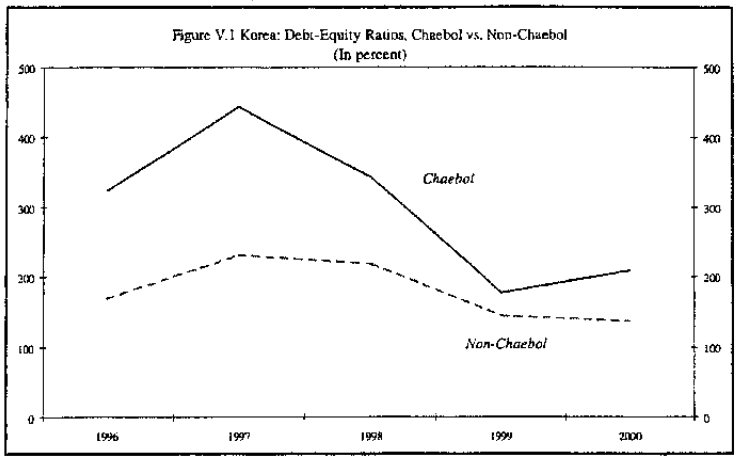
Capital Structure

8. Overall leverage increased sharply prior to the crisis reflecting the pickup in debt-financed investment (Table V.1). The average debt-equity ratio rose from 245 percent in 1996 to 336 percent in 1997, which was quite high by international standards and roughly double the OECD average.[3] Because of restrictions that favored debt over equity financing, corporations financed much of their investment with short-term borrowing from banks. Between 1996 and 1997, total liabilities rose by W 70 trillion while the book value of equity remained unchanged.

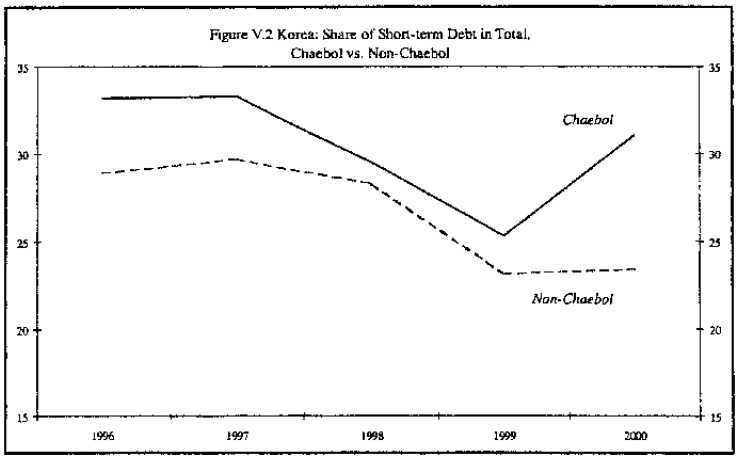
9. After the crisis, average debt-equity ratios fell from their peak in 1997 to 175 percent in 2000. However, almost 90 percent of the decline in the debt-equity ratio was due to the issuance of equity than to actual debt reduction. Taking advantage of the rising stock market, corporations raised equity by W 60 trillion compared to a decline in liabilities of only W 16 trillion (Table V.1). Moreover since 1999, debt levels have remained largely unchanged, and in 2000 were still high compare to pre-crisis levels.

[3] In addition to the rise in debt-financed investment, the spike in the debt-equity ratio in 1997 also reflected the overshooting of the exchange rate.

10. The debt-equity ratio of *chaebol* firms was almost double that of the smaller non-*chaebol* in 1996, and both groups sharply increased their leverage the following year (Figure V.1). Since then, *chaebol* firms made greater progress in reducing their leverage than non-*chaebol* firms, with the gap between the two groups having narrowed steadily during the period.



11. The maturity structure of corporate debt has not improved since the crisis. After a marked improvement between 1998 and 1999, the share of short-term borrowing in total debt jumped to 28 percent in 2000. Including the portion of long-term debt that falls due within one year (i.e., on a residual maturity basis), short term debt reached 43 percent in 2000, above the level in 1996. Part of the reason is that corporations issued a large amount of corporate bonds after the crisis with a three-year maturity and began to face large repayments starting in 2000. This bunching of maturities was mainly concentrated among the larger *chaebol* firms that were able to maintain access to capital markets and rollover their obligations during the crisis. As a result, *chaebol* firms have made less progress than the non-*chaebol* in lengthening the maturity structure of their debt (Figure V.2).



12. Firms also became significantly less liquid during the period. The current ratio (the ratio of current assets and current liabilities), which measures a firm's ability to meet short-term obligations through quick sale of liquid assets, worsened significantly during the period, falling from 99 percent in 1996 to 78 percent in 2000 (Table V.2). Despite the shortening of maturity on the liability side of their balance sheets, firms did not make the associated shift into shorter-term assets. This decline in liquidity suggests that firms became more vulnerable to a cutoff in credit lines or a flight to quality in financial assets. Liquidity is much worse for *chaebol* firms whose current ratios fell from 94 percent in 1997 to only 70 percent in 2000. Non-*chaebol* also experienced a slight decline in liquidity, but in 2000, their current ratio was a healthy 97 percent.

Table V.2 Korea: Liquidity - Current Ratios, 1996-2000
(in percent)

	1996	1997	1998	1999	2000
Current assets / current liabilities	98.7	92.1	87.9	91.6	78.0
Chaebol	94.3	91.1	89.1	90.3	70.1
Non-*chaebol*	107.7	94.3	85.8	93.9	96.8

Profitability

13. Operating profitability (excluding financial expenses) has improved since the crisis, due in large part to the strong economic recovery. Operating income to sales, which looks at earnings from the normal course of business, showed steady improvement since 1998 indicating that, at least at the operational level, cash flow and performance have strengthened (Table V.3). Another useful measure is the interest coverage ratio (ICR), defined as the ratio of earnings before interest, tax, depreciation and amortization or EBITDA to interest expense, which measure a firm's capacity to generate sufficient cash flow to cover its interest payments. After falling sharply in 1998, the ICR recovered strongly, but remained below pre-crisis levels. The share of companies with an ICR of less than 100 fell from its peak of 30 percent in 1998 to 24 percent in 2000.

14. Despite the improvement in operating performance, overall profitability remained weak because of the large interest burden on debt. Net financial expenses, which include non-operating costs such as interest payments, and losses and gains on foreign currency transactions and assets, remained very high and cut deeply into earnings. In 2000, they took up over 90 percent of operating income. After accounting for these non-operating costs, net earnings (so called "ordinary income") showed almost no improvement over the period. Ordinary income to sales fell from 1.1 percent in 1996 to 0.6 percent in 2000.

15. Other more comprehensive measures of profitability, such as return on assets (ROA) or on sales (ROS) that net out tax payments and any extraordinary losses on investments ("net income") paint an even worse picture. In 2000, firms on average made net losses of $1.5 for every $100 of sales in 2000 (minus 1.5 percent return on sales). This is surprising when one considers that the firms in the samples represent those companies that managed to survive the crisis and were in a position to benefit from the rapid recovery.

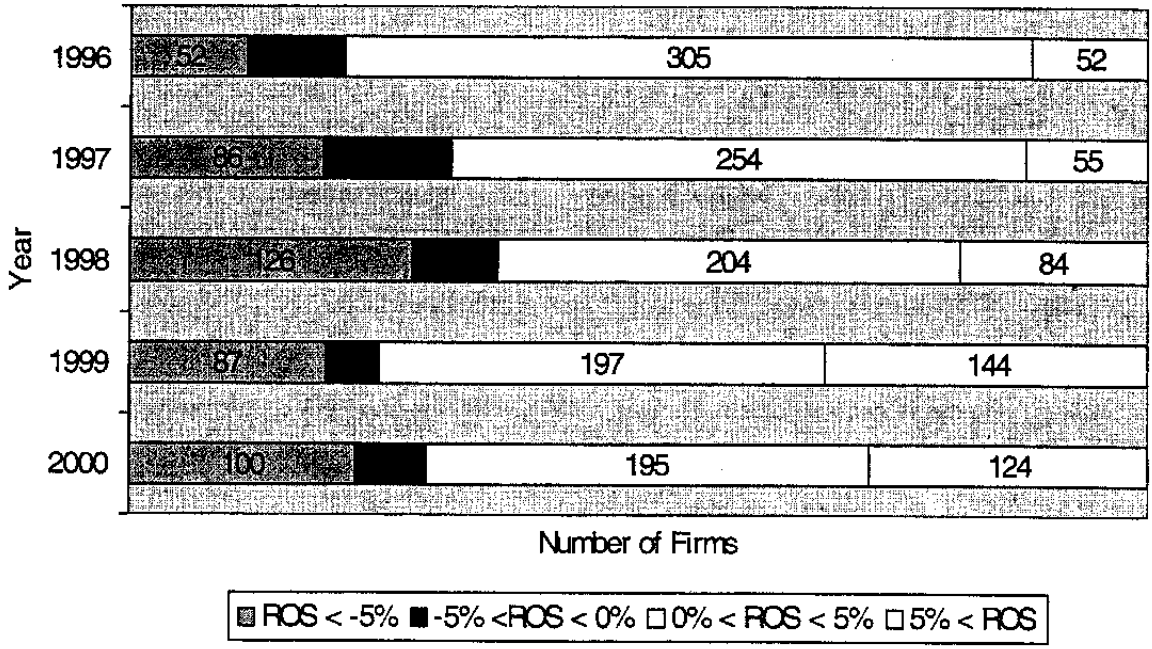
16. The bleak picture on profitability, however, masked the widening gap between good and bad performers. Separating companies by their return on sales (ROS) reveals that the number of firms at opposite ends of the distribution increased over the period. The proportion of companies with a ROS of below -5 percent or above +5 percent rose from 23 percent in 1996 to 50 percent in 2000 (Figure 3). The proportion of companies with negative ROS increased from one in five in 1996 to almost one in three in 2000.

Table V.3 Korea: Indicators of Profitability, 1996-2000
(in percent)

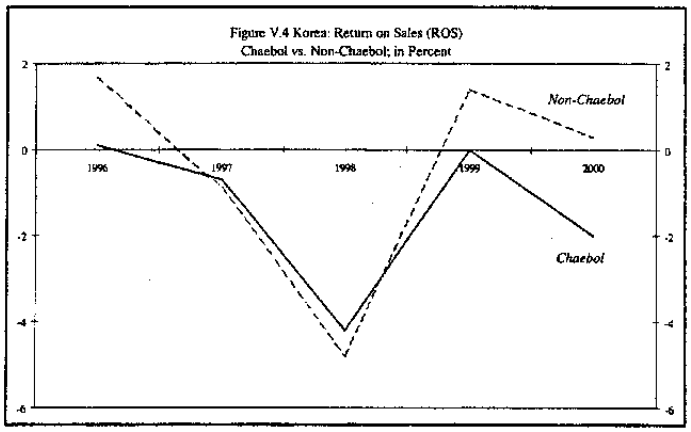
	1996	1997	1998	1999	2000
Interest Coverage Ratio (ICR) 1/	228	190	119	224	211
Chaebol	205	170	97	194	171
Non-*chaebol*	270	233	169	291	298
Operating income to sales	5.5	6.4	4.5	5.3	6.4
Chaebol	4.6	5.8	3.7	4.5	6.1
Non-*chaebol*	7.7	8.0	6.8	7.7	7.2
Ordinary income to sales	1.1	-0.2	-2.1	1.4	0.6
Chaebol	0.4	-0.5	-2.4	1.1	0.3
Non-*chaebol*	2.7	0.4	-1.2	2.4	1.5
Net income to sales (ROS)	0.5	-0.7	-4.3	0.3	-1.5
Chaebol	0.1	-0.7	-4.2	0.0	-2.0
Non-*chaebol*	1.7	-0.9	-4.8	1.4	0.3
Memorandum items:					
Return on assets (ROA)	0.5	-0.6	-3.8	0.3	-1.5

1/ EBITDA (earnings before interest, taxes, depreciation and amortization divided by interest payments.

Figure V.3 Distribution of ROS



17. *Chaebol* firms, in general, were less profitable despite having lower financial expenses. Operating income to sales for *chaebol* firms improved from 4.6 percent in 1996 to 6.1 percent in 2000 while it remained steady for non-*chaebol* firms, albeit at a higher level. *Chaebol* also had lower financial expenses, but this was not enough to generate positive net returns. After accounting for financial expenses, taxes, and investment losses, the *chaebol* recorded negative or zero returns on sale in 1999 and 2000, compared to small but positive returns for the smaller firms (Figure V.4).



18. Although average borrowing costs on debt have come down steadily from its peak in 1998, they still remain above pre-crisis levels (Table V.4). Part of the reason is that most of the corporate bonds issued after the crisis were at fixed rates and consequently were unaffected by the subsequent decline in interest rates. Prior to the crisis, smaller companies faced higher borrowing costs than the larger *chaebol*, most likely reflecting their difficulty in accessing directly the capital markets. This pattern, however, reversed starting in 1997 as non-*chaebol* enjoyed lower interest rates on their borrowings, by as much as 400 basis points in 2000. This premium perhaps reflected their lower credit risk and greater progress in restructuring. Smaller companies that survived the crisis were in general less indebted, more liquid, and more profitable than the larger *chaebol.*

Table V.4 Korea: Indicators of Financial Costs, 1996-2000
(in percent)

	1996	1997	1998	1999	2000
Net financial expenses / Total expense	4.5	6.6	6.3	3.9	5.8
Chaebol	4.2	6.3	5.9	3.4	5.8
Non-*chaebol*	5.1	7.5	7.7	5.5	5.8
Net financial expenses / Sales	4.3	5.8	5.8	3.4	5.8
Chaebol	4.2	6.3	6.1	3.4	5.9
Non-*chaebol*	5.0	7.5	8.0	5.4	5.7
Interest expense / Debt	9.6	7.8	12.6	12.1	11.5
Chaebol	9.5	8.3	13.7	13.7	13.2
Non-*chaebol*	9.8	6.9	10.5	9.6	9.0

Activity and Productivity

19. After three sluggish years, sales rebounded strongly in 2000, spurred by the rapid recovery of the economy (Table V.5). However, the pickup in sales did not necessarily translate to higher profits as indicated in the previous section. Part of the reason may have been that much of this increase in sales took place internally between *chaebol* affiliates and was not based on market terms. Facing the threat of a breakup, *chaebol* groups struggled to support weaker affiliates by transferring resources from their healthy ones. This is partially borne out by the fact that *chaebol* affiliated firms featured higher asset-turnover ratios but lower profit margins than non-*chaebol* firms. In 2000, the asset turnover ratio (sales to asset) for *chaebol* was more than double that for non-*chaebol* firms. Moreover since 1997, *chaebol* have increased their turnover ratio while non-*chaebol* lowered theirs.

Table V.5 Korea: Turnover and Productivity, 1996-2000
(in percent)

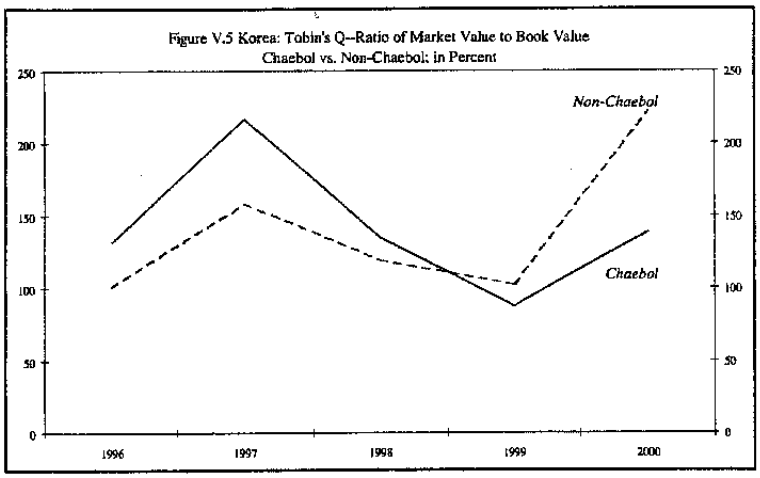
	1996	1997	1998	1999	2000
Sales / Assets	96.8	87.3	88.7	86.8	100.5
Chaebol	117.6	104.5	108.9	108.4	128.6
Non-*chaebol*	66.0	60.3	57.6	54.1	60.2
Operating profit per employee (1,000 won)	17,043	24,790	22,353	28,551	38,147
Sales per employee (1,000 won)	310,929	388,682	493,423	536,644	597,247
Net income per employee (1,000 won)	1,698	-2,853	-21,289	1,734	-8,764
Memorandum items:					
Number of employees	799,683	732,114	613,121	618,855	622,044

20. Productivity showed some signs of improvement, as the labor force was reduced. Sales per employee rose steadily over the period due to large layoffs rather than higher profits. The number of employees in the sample companies fell by 22 percent between 1996 and 2000. However, despite this large reduction in labor costs, net income per employee declined over the period and turned negative in 2000.

Market Valuation

21. Prior to the crisis, markets appeared to value *chaebol* firms more highly than non-*chaebol* firms. Using a Tobin's q-measure of market value to book value, *chaebol* firms on average were valued about 34 percent higher than non-*chaebol* firms in 1996 (Figure V.5).

However, this *chaebol* premium peaked in 1997 and then turned negative. By 2000, markets were valuing *chaebol* firms at a 37 percent discount compared to non-*chaebol* firms. As described earlier, the same turnaround occurred in the relative interest rates charged to *chaebol*, but some two years earlier.



D. The *Chaebol* Factor

22. The *chaebol* were heavily criticized for causing and contributing to the severity of the crisis. Their over reliance on debt financing, dominant position in several industries, poor corporate governance practices, and complex linkages left the corporate sector weak, uncompetitive, and ultimately vulnerable to a financial crisis. In particular, cross-debt guarantees and shareholdings diluted accountability for poor business decisions by creating soft-budget constraints for weaker affiliates. Cross-shareholdings also allowed a large investor, typically a family owner, to control the company with little of his own capital at risk. Owners took advantage of this to expand into non-core areas or extend control at the expense of minority shareholders. The lack of corporate transparency also deterred outsiders from investing in Korean companies.

23. Empirical research on the *chaebol* has found evidence that the *chaebol* structure hindered corporate performance. Shin and Park (1999) compared the financing constraints of the *chaebol* and non-*chaebol* firms and found that the soft budget constraint within the *chaebol* structure permitted *chaebol* firms to invest more than non-*chaebol* despite the poorer growth opportunities. Joh (2000) found firm-level evidence that greater control-ownership disparities created conflicts of interest among shareholders and lead to poorer firm performance. More broadly, Johnson et al (2000) have argued that weak corporate governance can leave a country vulnerable to a sudden loss of investor confidence, resulting in a collapse in the exchange rate and a sharp fall in asset prices.

24. The findings in this paper are consistent with the findings of previous studies. In many respects, the *chaebol* lagged behind their smaller counterparts in improving their capital structure, profitability, and productivity. At the start of the crisis, *chaebol* had weaker operating performance, lower financial expenses, and lower returns on assets and sales than their smaller counterparts (see Table V.6 for a comparison of the two groups). Yet despite these drawbacks, *chaebol* firms received more favorable borrowing terms and higher market valuations, suggesting that either equity investors and financial institutions were not paying

adequate attention to corporate fundamentals or they considered the larger *chaebol* "too big to fail." With just two exceptions—Kukje in 1985 and Woosung Construction in 1996—no large business or nationwide bank was allowed to fail until 1997.

25. However, this perception changed after the crisis as both investors and financial institutions began to look more carefully at the weaknesses in the *chaebol* structure. Starting in 1999, the *chaebol* premium quickly turned to a discount as *chaebol* firms faced significantly higher borrowing costs and lower market valuations compared to their smaller counterparts. The string of large bankruptcies, which began in early 1997 followed by the bankruptcy of the Daewoo group in 1999, changed investors' perception of the large *chaebol* and reoriented focus to the less risky and better performing non-*chaebol* firms. In addition, with the restructuring of the banks and improved supervision and loan classification practices, banks became more aggressive in assessing the credit worthiness of their borrowers which was reflected in their loan pricing.

E. Regression Analysis

26. Rather than a firm optimization model, the paper uses regression analysis to examine the correlation between firm profitability and their various determinants. As posited in the literature, these determinants include: firm size, financial structure, turnover, and industry and firm-specific characteristics. Three different measures of profitability—operating income, ordinary income, and net income to sales are used.[4] Operating income focuses mainly upon earnings from the regular business operations of the firms; ordinary income accounts for financial expenses/earnings, such as on interest payments; and net income is the final measure after taxes and extraordinary gains and losses.

For the determinants of profitability, the following independent variables are included:

- *Log of sales* as a control for firm size.
- *Sum of current maturities and short-term borrowing to total liabilities* as an indicator for the maturity structure of debt.
- *Liabilities to assets ratio* (or debt-equity ratio) as a measure of leverage or corporate gearing.
- *Net financial expenses over total expense* to measure the impact of financial burden affects profitability.

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[4] Dividing by sales rather than by assets is more applicable to the Korean case since *chaebol* had higher asset turnover (sales / assets) than non-*chaebol*. In order to account for the large amount of intra-unit trading among *chaebol* affiliates, dividing by sales rather than assets provides a more accurate picture of profit margins.

Table V.6 Korea: Comparison of *Chaebol* vs. Non-*Chaebol*
(in percent)

		1996	1997	1998	1999	2000
1. Interest Coverage Ratio	*Chaebol*	205	170	97	194	171
	Non-*Chaebol*	270	233	169	291	298
2. Debt / Equity	*Chaebol*	325	444	344	178	209
	Non-*Chaebol*	170	232	219	145	137
3. Profitability						
Operating Income / Sales	*Chaebol*	4.6	5.8	3.7	4.5	6.1
	Non-*Chaebol*	7.7	8.0	6.8	7.7	7.2
Ordinary Income / Sales	*Chaebol*	0.4	-0.5	-2.4	1.1	0.3
	Non-*Chaebol*	2.7	0.4	-1.2	2.4	1.5
Return on Sales	*Chaebol*	0.1	-0.7	-4.2	0.0	-2.0
	Non-*Chaebol*	1.7	-0.9	-4.8	1.4	0.3
4. Liabilities / Asset	*Chaebol*	76.4	81.6	77.5	64.0	67.6
	Non-*Chaebol*	63.0	69.9	68.7	59.3	57.9
5. Current Asset / Current Liabilities	*Chaebol*	94.3	91.1	89.1	90.3	70.1
	Non-*Chaebol*	107.7	94.3	85.8	93.9	96.8
6. Debt Structure						
Short-term Borrowing / Liabilities	*Chaebol*	33.2	33.3	29.5	25.3	31.1
	Non-*Chaebol*	28.9	29.7	28.3	23.1	23.4
7. Financial Burden						
Net Financial Expense / Total Expense	*Chaebol*	4.2	6.3	5.9	3.4	5.8
	Non-*Chaebol*	5.1	7.5	7.7	5.5	5.8
Net Fin. Expense / Sales	*Chaebol*	4.2	6.3	6.1	3.4	5.9
	Non-*Chaebol*	5.0	7.5	8.0	5.4	5.7
Interest Expense / Debt	*Chaebol*	9.5	8.3	13.7	13.7	13.2
	Non-*Chaebol*	9.8	6.9	10.5	9.6	9.0
8. Sales / Asset	*Chaebol*	117.6	104.5	108.9	108.4	128.6
	Non-*Chaebol*	66.0	60.3	57.6	54.1	60.2
9. Market Value / Book Value	*Chaebol*	131.7	216.6	134.7	87.7	138.9
	Non-*Chaebol*	100.9	158.4	118.9	102.2	221.3

- *Ratio of new fixed assets to total assets* as a measure of new investment.

- *Asset turnover ratio* (assets / turnover) to examine the correlation between sales and profitability, particularly as they relate to intra-unit trading within *chaebol* groups.

- *Chaebol dummy variable* to account for any *chaebol*-specific factors.

To control for firm and industry-specific characteristics, a fixed effect regression, with both industry and time dummies, was utilized.

27. In addition to the standard determinants of profitability, the relationship between ownership structure and profitability was also examined. To measure the relative power of major shareholders over minority holders, the Zeno-index (Z-index) measure of ownership was used. The conventional measure of shareholder power is the Herfindal index, which is simply the share of the majority or largest investors. The Z-index is more a more powerful measure of corporate control as it looks not only at the absolute power of a single shareholder, but also at the concentration of voting rights. In other words, the Z-index captures the ability of swing voters (e.g., votes of affiliated firms) to change outcomes and could be considered a more robust indicator of shareholder power in the Korean case.[5]

Results for Profitability

28. Table V.7 summarizes the results of the regression using the three different measures of profitability. The regression using operating profits yielded the greatest explanatory power and with net income the least. In all three regressions, size of the firm mattered, and year and industry dummies were generally significant. The main findings are as follows:

- *Leverage was negatively associated with profitability and was significant in all three regressions.* Higher financial expenses, as represented by the share of net financial expenses in total expenses, depressed ordinary and net income but not operating profits. This may not be surprising as operating profit is a gross term that does not include financial cost and may have benefited from the higher debt-financed investment.

- *New investment raised operating profits but did not yield significant positive net returns.* New investment (as measured by new fixed assets over total assets) was positively associated with operating profits but had no significant link with ordinary or net income, suggesting that new investment failed to generate positive net returns.

[5] For more details, see Crama et al. (1999, 2001).

Table V.7 Korea: Regression Results-Determinants of Profitability, 1996-2000

	Operating Profit/Sales		Ordinary Income/Sales		Net Income/Sales	
Dependent Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Ln (Sales)	0.03*	18.96	0.04*	12.01	0.05*	7.37
(Short Term Borrowing + Current Maturities) / Liabilities	-0.06*	-6.33	-0.02	-1.37	0.03	0.83
Total Liabilities / Asset	-0.28*	-23	-0.33*	-14.71	-0.30*	-9.7
Net Financial Expenses / Total Expense	0.21*	8.15	-0.87*	-18.23	-0.97*	-13.21
New Fixed Asset / Asset	0.003**	1.81	-0.003	-0.7	-0.002	-0.37
Sales / Asset	-0.005*	-3.68	0.004	1.5	0.002	0.43
Current Asset / Current Liabilities	-0.012*	-6.28	-0.002	-0.55	0.009	1.52
Chaebol Dummy	-0.027*	-6.82	-0.037*	-5.07	-0.044*	-3.11
Z-index	0.009*	8	0.016*	7.92	0.010*	2.61
$(Z\text{-index})^2$	-0.0001*	-8.06	-0.0001*	-7.97	-0.0001*	-2.65
Year	Yes		Yes		Yes	
Industry	Yes		Yes		Yes	
R-squared	0.52		0.48		0.27	
Adjusted R-squared	0.52		0.48		0.26	
S.E. of regression	0.38		0.75		2.49	
F-statistic	101.02		87.34		34.56	

*Significant at 5 percent level
**Significant at 10 percent level

- *Higher turnover did not generate more profits.* In fact, the turnover ratio (sales over assets) was negatively correlated with operating profit and insignificant with ordinary and net income, indicating that the higher turnover within the *chaebol* was not profitable. This is consistent with the notion that much of this inter-unit trading was done to support weaker loss-making *chaebol* affiliates.

- *Chaebol affiliation meant lower profits.* Even after accounting for the standard determinants of profitability, being affiliated with a *chaebol* was negatively associated with profitability, both on an operating and on a net basis.

- *Ownership concentration was negatively associated with profitability.* In all three regressions, the Z-index featured a positive coefficient on the linear term and a negative one on the square term, indicating the existence of a non-linear relationship between ownership concentration and profitability. When calculated at the average Z-index level, the combined coefficient was negative, suggesting that higher ownership concentration lowered profitability, perhaps by distorting corporate decision-making and accountability.

Results for Market Valuation

29. Regressions were also run to examine how markets valued firms and whether this perception changed since the crisis (Table V.8). The sample was divided into two periods: a pre-crisis period (1996–97) and a post-crisis period (1998–2000). The dependent variable is a Tobin-q ratio of market to book value. Based on the results of the profitability test, the following independent variables are used: log of sales, current ratio (current liabilities over current assets), debt-equity ratio, financial burden, new investment rate (new fixed assets / assets), liquidity ratio, interest coverage ratio, *chaebol* dummy, and the Z-index.

Table V.8 Korea: Regression Results-Market Value to Book Value, 1996-2000

	1996-2000		1996-1997		1998-2000	
Dependent Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Ln (Sales)	-0.10*	-12.34	-0.45*	-49.28	-0.04*	-5.96
Current Liabilities / Asset	0.42*	6.47	-0.64*	-6.16	-0.16*	-3.86
Debt / Equity	-0.33*	-10.49	0.31*	94.08	0.02*	17.92
Net Financial Expenses / Total Expense	-0.12*	-2.4	-0.14	-1.01	-0.06*	-4.05
New Fixed Asset / Asset	0.04*	5.42	-0.02	-0.81	-0.003	-0.58
Curr. Asset/Curr Liab	0.03*	2.99	0.01	0.31	0.03*	3.74
Interest Coverage Ratio	0.0	0.78	0.01*	4.02	0	1.62
Chaebol Dummy	0.06*	2.5	0.05**	1.89	-0.04*	-2.35
Z-index	-0.003	-0.55	-0.007	-1.27	0.03*	5.9
$(Z\text{-index})^2$	0.0	0.8	0.0001	1.53	-0.0002*	-5.7
Year	Yes		Yes		Yes	
Industry	Yes		Yes		Yes	
R-squared	0.64		0.95		0.71	
Adjusted R-squared	0.64		0.95		0.7	
S.E. of regression	2.98		3.14		1.12	
F-statistic	164.66		799.05		145.32	
Total panel observations	2251		904		1347	

*Significant at 5 percent level
**Significant at 10 percent level

30. In general, it appears that markets did focus on corporate fundamentals, such as liquidity, leverage, and profitability in valuing firm's equity, in addition to other factors such as ownership and *chaebol* affiliation.

- *Before the crisis, markets assigned higher valuation to chaebol than to non-chaebol firms.* In the 1996–97 regression, the coefficient on the *chaebol* dummy was positive and significant at the 10 percent confidence level, suggesting that *chaebol* affiliated firms received a premium by the markets over non-*chaebol* firms.

- *After the crisis, the chaebol premium disappeared and turned negative.* Even after controlling for other factors, *chaebol* firms were still assigned lower values by the market than non-*chaebol* firms. Possible reasons include the undoing of the "too big to fail" perception following the collapse of several large *chaebol* and greater investor emphasis on corporate governance.

- *After the crisis, a significant link between ownership concentration and market valuation appeared.* The combined coefficient for the Z-index (evaluated at the mean level) turned strongly negative and significant in 1998–2000, suggesting that markets were more focused on the ownership structure of firms after the crisis. One possibility is that investors, particularly foreigners, began paying more attention to the treatment of minority shareholders by major shareholders in their investment decision. Foreign ownership in the Korean stock market rose rapidly during this period, from 13 percent in 1996 to over 30 percent in 2000 following the removal of limits on foreign ownership of Korean equity.

- *Liquidity also appeared to matter more after the crisis.* The coefficient on the current assets to current liabilities ratio turned significantly positive in 1998–2000.

F. Conclusion

31. The paper identifies factors that contributed to the poor corporate performance since the crisis. Excessive leverage depressed profitability, mainly through the large interest burden, and lowered market valuation. New investments on average did not generate significant positive returns, suggesting that companies that chose to expand instead of consolidate during the period fared poorly. In particular, the increase in turnover among the *chaebol* firms was not profit-generating, offering evidence that intra-*chaebol* trading may have been directed to support weaker affiliates.

32. In addition, financial markets and institutions appeared to have signaled that the old *chaebol* structure no longer provided significant advantages. The premium once enjoyed by the *chaebol* in terms of lower borrowing costs and higher market valuations disappeared in 1999 and switched to a large discount. Strengthened supervision, the emergence of sound banks and a new credit culture, and the undoing of the important lesson of "too big to fail" might have contributed to souring market perception on the *chaebol*. The negative view may also reflect the slow progress by the large *chaebol* since the crisis in reducing leverage and improving profitability compared to their non-*chaebol* counterparts.

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VI. Bank Privatization In Korea: Developments and Strategies[1]

There has been only limited progress in privatizing banks that were nationalized in the aftermath of the 1997 financial crisis in Korea. With the gradual improvement in the health of nationalized banks and increased consolidation of the banking system, the government's privatization efforts are moving into higher gear in 2002. For success, a clear strategy is needed to oversee and coordinate the privatization process for all institutions. This paper discusses the challenges of defining such a strategy, with emphasis on the trade-offs between multiple objectives of privatization, the constraints imposed by the existing condition of banks to be privatized, and the choice of privatization methods that could be adopted.

A. Introduction

1. The restructuring of the Korean financial sector has resulted in an significant increase in government ownership of banks. The conflicting role of the government as owner and supervisor of banks is stalling the pace of restructuring the corporate sector as it raises the risk that creditors do not make decisions based on their own commercial interests and inappropriately prop up failing companies. With the substantial headway made in recapitalizing and restructuring of the financial sector, the Korean authorities' priorities are rightly shifting to the return of these institutions to the private sector. This process presents unique challenges and opportunities and will affect the future structure of the financial sector.

2. The paper is organized as follows: Section B describes the emerging structure of Korean banking sector and Section C summarizes the privatization efforts of the Korean government since 1999. Section D discusses the remaining challenges in privatization of government-owned banks, while Section E concludes.

B. Emerging Structure of Korean Banking Sector

3. Financial restructuring of the Korean banking sector resulted in a significant change in the ownership structure and concentration in the sector.[2] Prior to the crisis, the presence of foreign capital in the sector was limited to small portfolio investments and government ownership was significant only for specialized and development banks. In the process of financial restructuring the government injected W 85 trillion into 14 commercial and three specialized policy banks, increasing its control in the sector from 33 percent of banking sector assets at end-1996 to 54 percent at end-2000 (Table VI.1). Foreign ownership also

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[1] This paper was prepared by Meral Karasulu (MAE).

[2] For a detailed discussion of the structure of the financial sector before and after the crisis and a description of financial institutions in Korea, see Karasulu (2001) and Chopra et al. (2001).

increased through debt/equity swaps, the sale of 51 percent of a nationalized bank, and common stock and GDR sales in capital markets. At end-2000, foreigners held 32 percent of commercial bank assets. Concentration in the sector has also increased through the purchase and assumption of assets and liabilities of closed banks, forced mergers by the government in intervened banks, and voluntary mergers that followed government's pronounced preference for larger banks in the sector.

Table VI.1. Korea: Change in Ownership in the Banking Sector 1/

	Dec-96		Dec-00		
	Government Ownership (Percent)	Total Assets (tr. Won)	Government Ownership (Percent)	Foreign Ownership (Percent)	Total Assets (tr. Won)
Commercial Banks	**15.70**	**315.30**	**36.81**	**31.45**	**516.60**
National	**16.60**	**280.26**	**36.98**	**34.13**	**473.33**
Kookmin	17.08	31.41	6.50 5/	58.10	81.52
Hanvit	14.20 2/	57.46	100.00	...	69.85
Korea Housing & Commercial	26.32	28.08	14.50 5/	66.38	60.44
Cho Hung	6.55	32.64	80.05	0.22	48.89
Shinhan	3.29	21.70	0.00	32.17	47.51
Korea Exchange	47.88	35.27	32.16	33.50	44.55
Hana	9.06 3/	11.89	0.00	32.17	41.77
Korea First	7.00	29.93	49.01	50.99	25.45
KorAm	4.74	6.69	0.00	61.49	28.17
Seoul	7.47	21.00	100.00	...	19.14
Peace	19.17 4/	4.20	100.00	...	6.04
Regional	**8.40**	**35.04**	**34.93**	**2.17**	**43.25**
Daegu	7.59	8.99	0.00	0.79	13.03
Pusan	8.97	7.93	0.00	7.02	11.88
Kyongnam	8.97	5.43	100.00	0.00	7.44
Kwangju	8.33	5.02	100.00	...	6.09
Jeonbuk	9.40	2.22	5.91	0.05	3.44
Cheju	7.99	5.43	100.00	...	1.38
S&D Banks	**88.12**	**96.38**	**99.50**	...	**200.22**
Korea Development Bank	100.00	58.54	100.00	...	130.38
Industrial Bank	64.50	28.96	98.00	...	50.37
Export-Import Bank of Korea	86.80	8.88	100.00	...	19.47
National Agricultural Cooperative Federation					
National Federation of Fisheries Cooperatives					
Total	**32.64**	**411.67**	**54.32**	**22.67**	**716.80**

1/ The subtotals for government ownership are calculated as the sum of products.
of individual shareholdings and total assets.
2/ Includes shares in Commercial and Hanil banks that merged to become Hanvit Bank in 1997.
3/ Includes shares in Boram bank previous to its merger into Hana Bank.
4/ Through cross-ownership in other other banks.
5/ Kookmin and KHCB merged on November 1, 2001 diluting the shares of the government in the New Kookmin bank to 9.64 and increasing that of the foreigners to 70 percent.

4. Financial sector consolidation has gained momentum in 2001 following the example set by the government. The government established Woori Financial Holding Company (FHC)—which comprises Hanvit, Peace, Kyongnam and Kwangju banks, and a merchant bank, all state-owned—in April, 2001. This was followed by the voluntary merger of two privately owned banks—Kookmin and Housing and Commercial Bank—creating the largest bank in Korea in November 2001. Shinhan Bank followed suit by launching its own FHC at end- 2001 and assuming management responsibility of another nationalized small bank with a strategic regional network. As a result of these developments concentration in the sector increased significantly (Table VI.2).

Table VI.2. Korea: Concentration in Commercial Banking

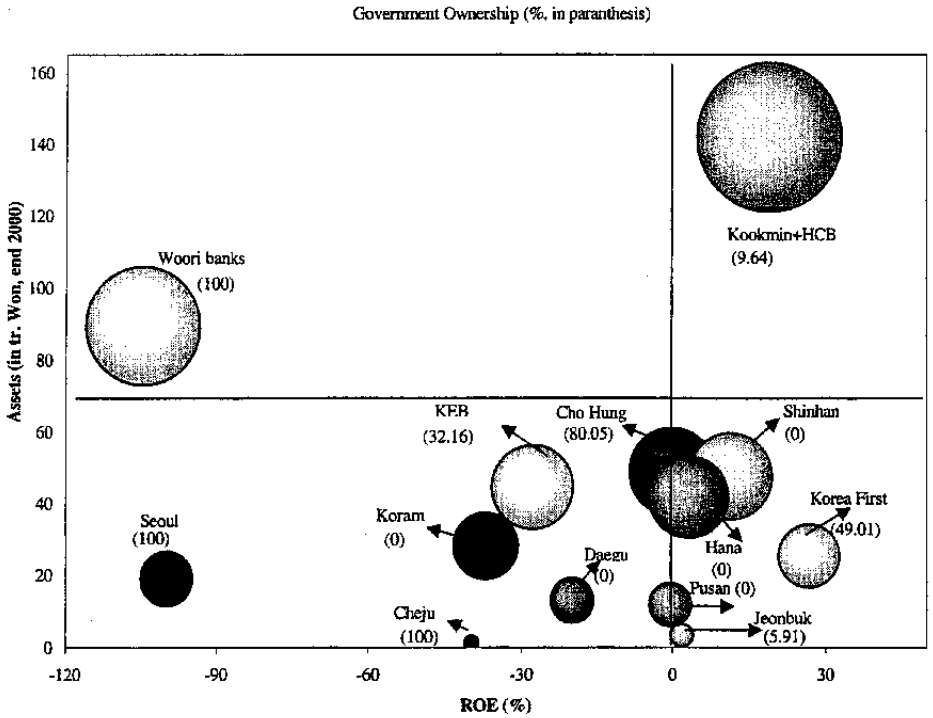
	1997 Dec.	2000 Dec.
Number of commercial banks	27.0	16.0
Share of assets of three largest banks[1]	26.7[2]	54.3
Share of assets of five largest banks[1]	--	72.1
Memorandum item:		
Total Assets (in trillion won)	437.71	516.6

Sources: FSS and staff calculations.
[1] Includes Woori FHC as one bank and New Kookmin.
[2] Beck, Demirguc-Kunt, and Levine (1999).

5. The consolidation trend is likely to continue in 2002 with the government as a precursor to the government's privatization strategy. The government, in an agreement with the labor unions, had postponed possible mergers under the Woori FHC until 2002, which also delineates the self-imposed deadline to begin the privatization of government-owned banks. Under political pressure to maximize the recovery of injected public funds, the merger of the smaller banks under Woori FHC into Hanvit bank may emerge as a means to increase the market value of the merged bank. In addition, Seoul and Chohung banks, and Korea Exchange Bank (KEB) have recently indicated interest in several merger combinations involving these three banks.

6. In this transformation process, a two-tier banking structure is starting to emerge that can be broadly differentiated along the lines of ownership, scale, and profitability. Out of the remaining 16 commercial banks, seven are under the ownership of dispersed private owners, while the remaining nine banks are either majority government owned or co-owned by the government and private owners (Figure VI.1). Among national commercial banks, this two-tier structure is even more pronounced with only four banks (Kookmin, Shinhan, Hana, and Koram) under dispersed private ownership, while four banks (Hanvit, Chohung, Seoul and Peace) remain under full government control, and the remaining two (KEB and Korea First Bank (KFB)) are jointly owned by the government and foreign private owners. In terms of scale, the two large banks that emerged after the establishment of Woori and the merger of Kookmin/HCB dominate the market with a combined market share of about 50 percent both in deposit and loans, while the second-tier banks lag the two market leaders by a considerable margin in terms of scale. Profitability differences provide yet another dimension along which commercial banks are divided into a two-tier structure. Among the four privately held national commercial banks, only Koram Bank has reported negative return on equity (ROE) in 2001Q1, whereas all banks under majority government-ownership registered a negative ROE, although significant performance differences prevail within this group.

Figure VI.1. Korea: Two-Tier Structure in Commercial Banking (end-March, 2001)



7. Another byproduct of the financial restructuring process has been the increasing importance of government-owned specialized banks in financial intermediation. Since their establishment in the 1960s the role of specialized banks was limited to providing funds to sectors that were given priority in Korea's successive development plans and complement commercial banks in areas where they could not supply enough funds due to limitations in funding, profitability and expertise.[3] With subsequent changes in the financial environment, however, the specialized banks were allowed to expand their business into commercial banking areas, including lucrative consumer banking and credit card operations, although their balance sheets still maintain a structure consistent with their establishment goals. For their funding they rely heavily on public funds and the issue of domestic and foreign debentures, but they compete with commercial banks for deposits. In the recovery process from the crisis they became instrumental in successfully avoiding a liquidity crunch in the corporate bond market and providing credit to small and medium enterprises, which otherwise would have been priced out of the market due to the inexperience of commercial banks and other financial intermediaries in pricing and accepting risk in an environment of high uncertainty. Notwithstanding their success in these areas, their encroachment into commercial banking with the backing of public funds and under the full ownership of government creates an uneven playing field in the otherwise competitive commercial banking sector.

[3] For a detailed description of specialized banks see Financial Supervisory Service (2000).

C. Privatization Efforts in 1999–2001

8. Mindful of the inefficiencies generated by the dominance of the government in the banking sector, the Korean authorities have committed to return government-owned banks to private ownership. This commitment was present starting in the immediate aftermath of the crisis. The government offered Seoul Bank and KFB, the first two banks nationalized in the aftermath of the crisis, for sale in 1999. A majority stake of KFB was sold to Newbridge Capital in 1999, but attempts to sell Seoul Bank to strategic investors proved to be unsuccessful, prompting additional restructuring measures.[4] These measures included a management agreement with Deutsche Bank, which was hoped to end in an eventual equity partnership, and additional capital injections to reduce the overhang of impaired assets. At end 2001, new potential buyers, including some domestic industrial groups, have entered into negotiations to buy Seoul bank.

9. Following these initial attempts, the Korean government announced in mid-2000 its plans to sell commercial bank shares acquired since the crisis. The plan included (i) a redemption schedule of preferred shares in five banks that received funds in return for their P&A of five closed banks; and (ii) a flexible approach for the sale of common stock in five intervened banks (Hanvit, Seoul, Chohung, KFB, and KEB) that was conditional on the return of these banks to profitability, a thorough clean-up of their balance sheets, and market conditions. When the plan was announced it was hoped that these preconditions could be met in early 2002. The redemption of preferred shares have been continuing according to schedule, and it is excepted that all shares will be redeemed before the 2004 deadline. The government expects to recover W 1.3 trillion from this operation.

10. Additional capital deficiencies that emerged after the Daewoo crisis stalled privatization efforts. The fallout from Daewoo crisis and other work-out cases revealed additional capital deficiencies in the banking sector, concentrated mostly in banks that had already received public funds and some smaller private banks. As a result, the government nationalized Hanvit Bank and four smaller banks and provided additional capital injections to reduce impaired assets at these banks.

11. With the approach of their target date to begin privatization, the government issued so-called OPERA bonds for Woori FHC and Chohung Bank to stress its commitment to privatization.[5] Despite their complex structure, the four-year OPERA bonds issued by the

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[4] Negotiations to sell Seoul Bank to Hong Kong and Shanghai Banking Corporation (HSBC) broke down in mid-1999. HSBC's preference to focus on retail banking and reduce large corporate exposure by having the government assume a hefty share of the loan portfolio contributed to the failure of the deal. Talks between the government and the Deutsche Bank Capital Partners also ended in failure in September 2001.

[5] OPERA is an acronym for "Out-performance Equity Redeemable in any Asset." Similar bonds were used first in China in early 1990s and most recently in Italy for privatization and to raise funds.

KDIC in December 2001 are in essence bonds that may become exchangeable into common shares of either institution if the government succeeds in meeting a free float condition by 2004 (see Section D). The issuance of the bonds does not achieve an immediate change in ownership, and is likely to result in increased private ownership in only one bank. Nevertheless, it provides incentives to the government to increase private ownership in order to meet the float requirement.

12. A specific privatization strategy for KEB and KFB has not been identified yet. These banks have been capitalized jointly by the government and foreign strategic partners in the aftermath of the crisis. A privatization strategy of government's stake in these banks will have to take into account the foreign partner's business strategies and may require a joint decision with the respective foreign partners for the privatization method. The presence of a capital fund as the strategic partner in KFB instead of a banking group, as in KEB, may provide more options for the sale of government's shares in this bank.

D. Remaining Challenges in Bank Privatization

13. Past experience in privatization of state-owned banks highlight the challenges confronting the Korean government. These challenges can be broadly described in terms of a constrained optimization problem that includes: (i) a multiplicity of objectives; (ii) the constraints imposed by the existing condition of the banks to be privatized and the overall economic and political conditions; and (iii) the choice of privatization methods that can address the objectives within the unique political and economic context of the country. Accordingly, three well-defined stages in a privatization process can be outlined: (i) a mechanism for strategic choices; (ii) preparation of the state-controlled banks for privatization; and (iii) the mechanics of disposal. This section discusses these challenges within the Korean context and assesses the recent privatization efforts of the government.

Multiplicity of Objectives

14. Most privatization programs are identified with explicit or implicit multiple objectives that can potentially be in conflict with each other; a mechanism for strategic choices is needed to address these conflicts. The plethora of objectives includes revenue generation for the state, capitalization of banks, improvement of corporate governance and transparency, development of capital markets, improvement of managerial and technical know-how, and economic efficiency and competition.[6] The potential trade-off between these different objectives necessitates an overall privatization strategy that defines the relative priority attached to each objective and a decision-making mechanism that will identify the feasible options and make the strategic choices, while remaining accountable to elected

[6] See, for example, Heald (1985) and Braz(1999).

representatives of the taxpayer within the context of defined goals. The "success" of a privatization program can only be defined with respect to clearly defined policy objectives and without them it is likely to remain a politically contested issue.

15. The extensive public focus on revenue generation in Korean privatization efforts may have overshadowed other important objectives. As in other systemic crisis episodes, the restructuring of banks involved significant injections of public funds to ailing institutions (Box VI.1). The strong tradition of fiscal prudence and the political cycle are dictating a fast and substantial recovery of public funds, to which the Korean government responded with deadlines to return government-owned financial institutions to private ownership. However, the focus on revenue generation has created public expectations that would be hard to fulfill under the existing condition of the institutions that are targeted for privatization. Although the recovery of public funds should remain an objective in the privatization process, management of expectations is equally important to deter a public perception of fire-sales.

16. Equally relevant goals for the Korean banking sector are the improvement of corporate governance and transparency, development of managerial know-how, and maintaining efficiency and competition. Although the restructuring process led to a paradigm shift in the banking sector with stronger prudential regulations that also stress transparency and corporate governance, and a management culture that increasingly focuses on shareholder value rather than asset growth, much remains to be done. Privatization, depending on the choice of divestment method, could be a driving force in entrenching this emerging management culture. Despite the sharp increase in concentration, no clear signs of lack of competition have emerged in the sector. This is perhaps attributable to the leading role of the government in the consolidation process. If anything, there is increasing competition in the new growth areas, such as retail banking and credit cards, in an attempt to reduce exposure to large business groups and improve profitability. However, the privatization of large banks in a concentrated market may have significant implications for competition, economic efficiency, and future stability of the system. Although anti-trust policies should be the main policy tool to maintain a competitive market, the privatization method adopted may also be conducive to balancing the concentrated market structure with a dispersed ownership structure to mitigate risks of financial monopolies by a handful of owners.

17. Korea took steps to centralize the decision making process for the use of public funds; a similar mechanism is needed in the privatization process to balance these goals and the available privatization options. The efforts to privatize some banks and other NBFIs have been somewhat isolated efforts without a sufficiently clear strategy. With significant amounts at stake during the privatization process and the need to balance the above-mentioned objectives, a decision making mechanism is needed to establish a privatization program to oversee the sale of all state-owned financial institutions in a transparent manner, and take strategic decisions on timing and method of privatization consistent with established goals of

Box VI.1. Use of Public Funds and Recovery Prospects

Substantial public funds have been used to facilitate financial sector restructuring. As of end September 2001, gross of recoveries, a total of W 148.3 trillion (27½ percent of 2001 GDP) has been spent, out of which 60 percent was used for the banking sector. Two government agencies conduct most of the injection of public funds. KAMCO is responsible for the purchase of impaired assets whereas KDIC is charged with recapitalization of financial institutions, loss coverage and depositor protection. As a result of its function, KDIC become the largest single owner of commercial bank equity in the sector.

Of the total injections, 25 percent has been recovered as of end-September 2001. KAMCO and KDIC had widely different recovery rates reflecting the differences in their methods of public funds injections; KAMCO has recovered 63 percent of total funds it has injected, through various methods of disposing impaired asset it has purchased from financial institutions[1], whereas KDIC recoveries amounted to only 14 percent of total funds it has injected, mostly through dividends recovered in the liquidation process.

The recovery prospects of KAMCO and KDIC may shift significantly with the decline in asset value in KAMCO's portfolio and the start of the privatization process. Although KAMCO succeeded in rapid recovery of public funds so far, its remaining portfolio includes loans, including those of Daewoo that are more difficult to dispose with lucrative returns. KDIC, on the other hand, has an improving prospect to recover funds through the sale of its equity stakes in financial institutions.

Korea: Use and Recovery of Injected Public Funds
(end-September 2001, in trillion W)

	Total Injections	Total Recoveries
KDIC	90.9	12.5
KAMCO	38.4	24.2
Government	18.1	-
BOK	0.9	-
Total	**148.3**	**36.7**

Expectations of high recovery rates of pubic funds injected into the banking sector may be overstated. Out of the W 85 trillion injected into banking system, only W 34 trillion was spent to acquire equity and W 14 trillion was used for capital contributions. A large portion of these capital contributions may not be recovered in full, since they were used (i) to increase the capital of banks that acquired the five closed banks, in return for small preferred shares redeemable at par value; (ii) post-sale settlement of Korea First Bank and (iii) to recapitalize nationalized banks whose capital had to be written down due to past losses. Although bank stock prices have outperformed the market in 2001, a full recovery of funds injected into the banks may necessitate even higher price-to-book value ratios than those observed so far.

[1] For a summary of asset disposal methods used by KAMCO see Chopra et al (2001).

the program. An example of such a decision making process has been successfully used by the Korean authorities in the use of public funds. The Public Funds Management Committee (PFMC) established under the Ministry of Finance and Economics (MOFE) consists of government officials, academics and private sector participants and oversees the injection of public funds into the financial sector under clearly established guidelines for conduct and transparency. One possibility, therefore, would be to extend the PFMC's responsibilities to include decision making and oversight for the privatization process.

Preparation of Banks for Privatization

18. The preparation of state-owned banks for privatization is dictated by the financial conditions of the banks. Political and economic constraints, however, may turn this necessary step into a costly and drawn-out process. Most restructuring efforts include a combination of a clean-up of banks' asset portfolios, recapitalization, and cuts in operational costs. These measures are necessitated by the accumulated losses and the lack of profitability at these banks and usually justified as necessary steps to return them to private owners. However, the constraints—such as labor's resistance to some restructuring measures and privatization, the lack of political consensus on privatization or its timing and method, and the cyclical or structural weaknesses in demand by potential buyers—imposed by the overall economic and political conditions may also lead to misguided and costly pre-privatization restructuring, delays in privatization, and ultimately a reduction in the recovery rate of injected public funds.

19. In Korea's case, despite significant restructuring of government-owned banks, delays in corporate restructuring have led to concerns about the quality of banks' asset portfolios. All banks that were recapitalized by public funds implemented deep operational cuts that included labor shedding and branch closures and significantly reduced their impaired assets, first by direct sales to KAMCO and more recently by securitization of impaired assets. Despite these efforts, most of these banks recorded negative ROEs as of March 2001, although their performance has been on an upward trend since 2000. Also, their significant exposure to large work-out companies, whose restructuring has been delayed, and possible large gaps in classification and provisioning of these exposures by privately-owned- and government-owned banks are raising concerns about the true valuation of government-owned banks and adversely affecting market sentiment. Continued efforts to strengthen the balance sheets of government-owned banks, especially Chohung and Woori FHC, are therefore an essential prelude to privatization.

20. Consolidation of state-owned banks cannot address these underlying weaknesses and may prove counterproductive in the privatization process. The government's decision to consolidate Hanvit and three smaller banks under the Woori FHC may be a useful instrument of financial sector policy that favors large banks, but the concentration trend set into motion by Woori may also increase moral hazard in the system by creating banks that are considered to be too big to fail after privatization. In addition, sale of larger banks with questionable asset quality may require costly concessions to potential buyers to limit their downside risks. The restructuring measures enforced at Woori banks are also likely to entail additional costs

without clear benefits for increasing the recovery rate of injected public funds. For instance, Woori banks are in the process of consolidating different business lines of the group banks to benefit from economies of scale. Functional merger of activities may be helpful in reducing costs further, but the main concern about the asset quality of Hanvit Bank arising from its exposure to the corporate sector will remain the dominant issue in the privatization of the Woori FHC. Further, most government-owned banks, including Woori banks, engaged in costly overhauls of their image, including establishing new brand names and new business strategies. Although useful in laying the groundwork for a more profitable business, these measures may also reduce the base of potential suitors by pre-committing the banks to a certain business strategy that would be costly to redesign.

Methods of Privatization

21. The increasing sophistication of financial products provides several options for the sale of state-banks, but not all of them may be feasible for the objectives of privatization (Box VI.2). In addition to the trade-offs they pose for the attainment of various privatization goals, the feasibility of some disposal methods may be restricted by global macroeconomic conditions, the depth of domestic capital markets, and other regulatory restrictions.

22. The global downturn in 2001 and 2002 and the lack of a strong institutional investor base domestically are significant constraints on the Korean authorities' choice of disposal method. With the global downturn, expansion plans of major international players in the financial sector are likely to be postponed to focus instead on managing their existing risks in order to maintain profitability and shareholder value. This limits the possibilities for direct sale of banks to foreign strategic investors, who would be less eager to take over Korean banks that still retain under-provisioned exposures to work-out companies. Further, the continuing weaknesses in the insurance and ITC sectors limit the capacity of these sectors to provide institutional capital for privatization, leaving public share offerings as the other viable alternative.

23. Although these constraints point to public share offering as a viable privatization method, the Korean government, instead, opted for a strategy that buys time to overcome some of the constraints. The Korean stock market has sufficient liquidity and depth to absorb well-planned share offerings of government-owned banks. However, the concerns about the asset quality of banks and the stock market valuations that are likely to fall below expectations of the recovery of public funds made this option unattractive in the pre-election environment. In addition, the perception that the lack of strong ownership in the banking sector contributed to its malaise created a bias for either strategic or institutional investors to create a concentrated ownership structure. As a result, the Korean government chose a complex hybrid method to prepare for the privatization of Woori FHC and Chohung Bank while maintaining its approach of negotiating with strategic investors for direct sale or merger of the remaining banks.

Box VI.2. Privatization Methods

Public Share Offerings

There are three methods that have been utilized in public share offerings: Initial Public Offering (IPO), seasoned equity offerings (SEO), and private placements. In most privatization cases, the disposal involves a process that combines different issue types at different points in time depending on the depth and the performance of the stock market and the overall macroeconomic conditions.

This method can provide new capital to the privatized institutions or revenue for governments and contribute to the development of capital markets through dispersion of equity ownership. It may also help improve transparency, since stock exchange listings require strict disclosure measures. However, this method does not necessarily provide new managerial expertise and improve management accountability. Unless supported by strong corporate governance measures and rights for minority shareholders, agency problems between managers and dispersed owners may create incentives for excessive risk taking behavior by managers. These risks can be mitigated if there is a strong institutional investor base able to oversee the management and impose market discipline.

Sale to Strategic Investors

Sale to strategic investors can be accomplished either by trade sales through one-to-one negotiations or by tender auctions. Although their implications for attaining the goals of improved corporate governance, competition and profitability are similar, these methods may produce significantly different outcomes for revenue generation. Trade sales are more likely to include special provisions, such as option clauses designed to limit the downside risks to the investor.

Sale to strategic investors may provide gains in managerial and technical know-how, profitability, and improved corporate governance, because the sought-after strategic investor in most cases has sufficient experience and stature in running a bank and must have a convincing business strategy to improve the bank. However, for most emerging economies, this description often implies foreign strategic partners due to the absence of such managerial know-how domestically and may be shunned due to a national bias for domestic ownership.

However, securing the interest of a strategic investor is not always easy. Both domestic and international market conditions are critical for the success of privatization through this method. The financial health of the bank, its market share in the sector, the potential for growth of the sector and the bank are significant factors in attracting strategic investors. For foreign investors the ease of conducting business in the country, including the quality of the legal and supervisory frameworks in providing a well-supervised but business friendly and rule based environment, level of development of capital markets and openness of the capital account, the global consolidation trends in the banking sector may also play a role.

Hybrid Methods

Hybrid methods include a combination of the above methods for the sale of common stock or other forms of securities convertible to common stock (e.g., convertible bonds, and bonds with warrants). Although they can be useful to fine tune the offer to market conditions to optimize revenue generation, these methods may also dilute the advantages of pure methods of disposal they include. If convertible securities dominate the offer the transfer of ownership may be delayed postponing any gains in profitability, improved corporate governance and managerial know-how that may come with new owners. In addition, the valuation of different securities in the hybrid method may create transparency and marketing problems along with potential conflicts among targeted investor groups.

24. The issuance of the so-called OPERA bonds that may become exchangeable into either Woori or Chohung Bank shares is a nonbinding pre-commitment to privatization that may push strategic decisions into the future. The structure of the OPERA bonds comprise a fixed coupon bond for the first two years, which will afterwards transform into an exchangeable bond with an 18 percent conversion premium if a US$1 billion free float threshold for Woori FHC or Chohung Bank can be achieved. Despite its complicated structure, the bond provides flexibility to the government to pursue other privatization options other than the free float while providing protection to the investor.[7] The OPERA bond issue includes a nominal upfront equity option premium reflecting the risk that a conversion into an exchangeable bond may not take place if the government fails to meet the free float requirement. If the buoyant performance of bank shares in 2001 does not continue in 2002–04, the free float condition may require the government to sell shares at a price that they consider is not advantageous. However, even if a qualifying float can be achieved in the next two years, the structure of the bond suggests that would be a substantial increase in private ownership.

25. In the meantime the Korean authorities are taking steps to expand the domestic institutional investor base eligible to own banks. These steps include relaxation of bank ownership limits imposed on domestic investors and equity-investment limits on pension funds. Although the latter may help create a viable institutional investor base, the former has created concerns that bank ownership by *chaebol* may lead to abuse of banks through connected lending practices (Box VI.3). Prior to the crisis, the ownership restrictions separated industrial capital from financial capital, but failed to protect the financial sector from the abuse in the absence of strong limits on connected lending and large exposure, and also poor corporate governance. The government's proposal includes provisions to strengthen the connected lending limits, and a divestment requirement from industrial activity for *chaebol* to become eligible to own at least 10 percent of a commercial bank. Although these are significant steps to prevent abuse of banks by owners, the proposal could be strengthened further by including shares owned by all affiliated group companies in the calculation of the ownership ratio and the aggregate credit limits to connected parties.

E. Conclusion

26. The Korean authorities have stated that they are committed to privatizing government-owned banks. This is important, not least because a market driven corporate restructuring process will be greatly facilitated if it is led by sound and privately-owned banks. The privatization efforts since 1999 have, however, had only limited success, and the government faces several challenges as it strives to reinvigorate the process. An overall privatization program is needed to identify the goals of privatization, oversee the privatization of all state-owned financial institutions in a transparent manner, establish a consistent mechanism for the valuation of banks, and decide on the disposal methods. In

[7] If more than 25 percent in either bank is sold through a strategic sale or depository receipt issues, the notes can be put back.

Box VI.3. Bank Ownership Limits in Korea

Prior to the crisis, regulatory restrictions were instrumental in defining the ownership structure in the Korean banking sector. In order to discourage entry of *chaebol* into the banking sector in the course of bank privatization in early 1980s, ownership in Korean banks has been restricted since 1982. The stock holding limit for domestic investors was reduced from 8 percent in 1982 to 4 percent in December 1994 in nation-wide commercial banks, and was set at 15 percent for regional banks. However, during the restructuring process, holdings by the government and the KDIC as well as domestic shareholdings at merged banks were exempted from these restrictions. For foreign investors, the limit was set at 10 percent (15 percent for regional banks), but exemptions were possible with approval of the Financial Supervisory Commission/ Service (FSC/FSS) each time holdings exceeded 10 percent (15 percent for regional banks), 25 percent, and 33 percent. Domestic entities could also be granted similar exemptions as those applied to foreigners, but the subsidiaries of the top-30 *chaebol* could exceed the holding limits only in one bank.

Ownership restrictions served their purpose in form but not in gist. The main objectives of regulatory limits over bank ownership are to prevent abuse of the banks by large shareholders and other connected interests, protect depositors and safety nets, and ensure the stability of the financial system. In Korea, the restrictions were successful in deterring bank ownership by *chaebol*, but did not prevent abuse of the banks by large industrial groups.

Recently, the government announced plans to relax bank stock holding limits to remove reverse discrimination against domestic entities and to facilitate the sale of nationalized banks. The proposed amendment to the banking law will allow any single entity to own 10 percent of a commercial bank without advance reporting requirement. However, *chaebol* with more than 25 percent of capital invested in nonfinancial activities will not be able to exercise voting rights above 4 percent ownership, unless they spin off their affiliates in nonfinancial sector or commit to transform themselves into a financial *chaebol* within two years.

Although the proposal includes new measures to prevent abuse of banks by large shareholders it falls short of best practice. The proposed amendment includes the following measures: (i) a yearly fit and proper test; (ii) an aggregate credit limit of 50 percent of bank capital for large stockholders; (iii) a limit of 3 percent of bank capital on the acquisition of stocks affiliated to large stockholders; (iv) prohibition of cross-lending to other bank stockholders; (v) public reporting requirement of connected transactions above a certain size, which must be supported by at least two-thirds of the board of directors, and (vi) several other measures that increase the powers of supervisors in examining large stockholders and an amendment to the criminal law to strengthen penalties of noncompliance. Notwithstanding these useful steps, the high aggregate credit limit to large stockholders, and the exclusion of connected parties from the calculation of this limit falls short of best practice. Also, the 10 percent ownership limit does not include ownership through affiliated companies, except for securities firms under the group. This may become the Achilles heel of the law, as *chaebol* may exert power over banks through their cross-share holdings in other financial affiliates.

defining the goals, the recovery of injected public funds, although important, should not overshadow equally relevant goals of bank privatization, including the entrenchment of a management culture that favors shareholder value over asset growth. It should be recognized that managers will not be responsive to the market unless there is a market for the bank stocks.

27. In the period ahead, priority should be given to increase the free float of Chohung Bank and expedite the listing of Woori FHC to complete the process that started with the issuance of the OPERA bonds. This, however, is likely to require further clean-up of the balance sheets of these banks to convince markets and potential investors that known credit costs have been met. Indeed, until nationalized banks can demonstrate a capacity to earn sufficient profit to remunerate their capital and meet new credit costs in the future, privatization will remain difficult. The privatization strategy for Seoul bank, which is much smaller and apparently has a stronger balance sheet, could include an initial public offer and efforts to attract strategic investors.

28. The focus on the privatization of majority government-owned banks should not overshadow the sale of minority stakes in KEB, KFB and Kookmin Bank. The performance of Kookmin Bank and its improved potential after its merger present an excellent opportunity to divest the government's shares in the local market, and would send a strong signal of the government's commitment to privatization. For KEB and KFB, the approach chosen will need to take account of the business strategies of the existing strategic partners in these banks. If the current partners are not interested in increasing their share in these banks, a well-planned initial public offer presents a viable alternative.

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VII. Reform of Korean Insolvency Laws: A Review of Critical Issues [1]

The current insolvency regime in Korea does not provide appropriate tools to promote the orderly exit of nonviable companies and the rehabilitation of viable companies that are experiencing temporary problems. The laws are outmoded and inconsistent in policy direction. The government recognizes these problems and has initiated legislative reform to upgrade the insolvency regime so that it can better serve Korea's current and prospective needs, especially the development of vigorous banking and corporate sectors. This paper outlines the desirable elements of a reform program, including the advantages of a unified insolvency system, ways to enhance timeliness and predictability, options for addressing inter-creditor issues, steps to encourage debtor and creditor participation, and enhancements to the law of secured transactions.

A. Introduction

1. There is an urgent need for reform of insolvency laws in Korea. At a basic level, the laws are outmoded and inconsistent in policy direction. The laws include the Bankruptcy Act (based on German law prior to the major 1994 amendments), the Corporate Reorganization Act (based on the corporate reorganization procedures in the pre-1978 U.S. Bankruptcy Code), the Corporate Restructuring Act (based on 1950s Austrian law), and the unprecedented Corporate Restructuring Promotion Act. These laws do not provide appropriate tools to develop vigorous corporate and banking sectors in Korea. Hence, the insolvency regime does not serve the current or prospective needs of Korea.

2. The crisis that erupted in 1997 provided the initial impetus to insolvency law reform, principally to expedite the exit of nonviable firms and facilitate corporate restructuring. The Korean government made some headway in reforming the insolvency regime, albeit in a somewhat piecemeal fashion. For example, the legal amendments in 1998 included the enabling of a Management Committee of private sector professionals to lend expertise to the courts and the establishment of Creditors' Committees to take collective decisions with respect to the debtor enterprise. Furthermore, procedural and institutional reforms were introduced to improve the speed and efficiency of bankruptcy-related adjudication in the court system. These included issuance by the Supreme Court of a revised protocol on the corporate reorganization process, the imposition of some procedural time limits in court proceedings, and the establishment of specialized bankruptcy courts in the Seoul District and four provinces. More recently, in April 2001, legislation was introduced to sanction "pre-packaged" bankruptcy plans, which in principle would allow for expedited court approval of a reorganization plan if agreed beforehand by creditors. Lastly, the introduction of the

[1] This paper was prepared by Thomas Laryea (LEG).

Corporate Restructuring Promotion Act in September 2001 is perhaps the most striking reform of the Korean insolvency regime. This Act formalizes corporate work-out procedures by, inter alia, providing legal mechanisms for "bailing-in" dissenting creditors.

3. However, these reforms, and others at the margin, have not gone far enough to address the fundamental weakness in the system. There is a significant overhang of insolvent companies for which the insolvency regime has failed to provide an effective exit mechanism. Without the credible threat of bankruptcy, debtor firms in concert with lenient creditors have evaded the responsible resolution of chronic financial problems. Further, dissenting creditors have been able to block agreement on restructuring plans until their narrow demands have been met. The recent case of Hyundai Engineering and Construction (HEC) highlights some of the basic problems in the operation of the current insolvency law regime. Dissenting creditors in the HEC case were able to delay agreement on a debt-equity swap. This delay led to HEC incurring additional losses. In the end, the government stepped in with bond guarantees to bring about an agreement, albeit on terms that are unsatisfactory to some creditors and that left the company's viability suspect.

4. This paper provides a preliminary review of the issues that insolvency reform in Korea will need to address. Section B covers the principal elements of effective insolvency reform, including the advantages of a unified insolvency system, ways to enhance timeliness and predictability, options for addressing inter-creditor issues, steps to encourage debtor and creditor participation, and enhancements to the law of secured transactions. The goal is to provide a general outline of the key issues that will need to be addressed; precise recommendations on how these issues might be addressed in the Korean context would require further analysis. Section C offers some concluding remarks.

B. Principal Elements of Effective Insolvency Law Reform

5. The success of any reform effort to improve the insolvency legislative framework is, of course, interdependent on a number of factors. The first of these is discipline in the financial system. Financial sector reform should therefore be viewed in conjunction with insolvency reform, but is an area that is beyond the scope of this paper. Second, the creation and enforcement of security interests underpins the insolvency regime. Weaknesses in the law of security interests are reflected in the insolvency regime. Third, the successful operation of any insolvency regime relies on the enforcement mechanisms in the court system. Accordingly, this paper also notes aspects of the law of secured transactions and the court system in Korea that will need to be addressed with insolvency law reform.

Objectives of an Effective Corporate Insolvency System

6. An effective corporate insolvency regime strives to allocate risk among market participants in a predictable and transparent manner and to maintain economic value. These objectives are typically achieved through two complementary techniques: (i) direction of the orderly exit from the economy through liquidation of inefficient businesses; and

(ii) rehabilitation of viable and productive business that are experiencing non-fundamental liquidity or operational difficulties. The main guide-posts for designing the law to achieve the objectives of an effective insolvency regime are outlined below.

Creation of a Unitary Insolvency Law System

7. Korean general insolvency laws is strikingly fragmented. In addition to the Bankruptcy Act, the Corporate Reorganization Act, the Corporate Restructuring Act, and the Corporate Restructuring Promotion Act, there are other provisions related to insolvency law, such as in the Corporate Restructuring Vehicle Act. At a minimum, harmonization of these laws is warranted in order to bring predictability and certainty to the insolvency regime.

8. Going beyond harmonization, the creating a "unitary" insolvency law would be even more advantageous. Consistent with the approach that has been recently adopted in a number of countries—most notably Germany—a unitary law would eliminate the complication of converting a rehabilitation proceeding into a liquidation proceeding (and vice versa). Under a unitary approach, the appropriate insolvency resolution technique can be determined within a prescribed period in the proceeding based on an assessment of viability of the debtor's enterprise. Such a unified approach thus provides a framework for discipline and flexibility in the conduct of insolvency proceedings. A unitary approach also ensures that once a corporation is in the insolvency law regime, it cannot escape without a legal determination of its fate. Adoption of a unitary approach would yield substantial benefits in Korea given the extent of the current delays and uncertainty in the resolution of insolvency cases.

Timeliness and Predictability

9. Timeliness and predictability of an insolvency regime would provide considerable benefits to the restructuring process. To enhance timeliness and predictability in Korea, the following issues will need to be considered:

- ***Time Limits***—The absence of time limits (or at least the lack of their enforcement) have contributed to considerable delays in the current system. For instance, despite the 1998 streamlining of the Bankruptcy Act procedures, liquidations are projected to take five years, largely due to indeterminate procedures for the selling and distribution of debtor's assets. The imposition of time limits at all stages of the proceedings, with penalties for noncompliance, would improve predictability in the insolvency regime.

- ***Stay on Creditor Enforcement***—Under the existing law, a stay on creditor enforcement only comes into force once the court decides that a bankruptcy action should "commence." Prior to that decision, the imposition of the stay is subject to the discretion of the court. To enhance the predictability of the law, the stay could apply automatically once a creditor or debtor formally initiates proceedings.

- ***Pre-packaged Bankruptcy***—In circumstances where a debtor and the requisite majority of creditors have reached an out-of-court agreement on a restructuring, the law should provide for a "fast-track" mechanism that enables the plan to be approved shortly after filing, thereby avoiding the time and expense of full proceedings. The recent amendment to the Corporate Reorganization Act does not provide for such effective pre-packs.

Inter-Creditor Issues

10. Inter-creditor issues involve a number of competing considerations. On the one hand, the chances of a successful rehabilitation are increased when the leverage of dissenting creditors is reduced. This is particularly important where corporate insolvency is systemic and the option of wholesale liquidation of the corporate sector is not viable. On the other hand, the introduction of strong "cram down" rules against dissenting creditors weakens creditor rights. In the long term, strong cram down may reduce the availability of credit in the system. Furthermore, there may be concerns that cram-down rules will not be consistently applied by the courts in an equitable and predictable manner.

11. The benefits of cram down generally outweigh the disadvantages. However, a cram down mechanism will need to include principles on: (i) differentiating classes of creditors (based on both priority under liquidation and varying economic interests); and (ii) minimum protection for dissenting creditors. Cram down should be subject to rules providing that each dissenting creditor receive at least liquidation value (thereby safeguarding against forced rehabilitation where liquidation would be more efficient). And, a dissenting class should only be overridden where creditors in that class receive the full value of their claim or junior classes receive nothing (thereby safeguarding equitable treatment among creditor classes).

Debtor and Creditor Participation

12. The balance between debtor and creditor participation is a difficult but unavoidable issue in the design of insolvency law. Resolution of this issue needs to take account of institutional capacity of the courts and professional trustees to handle the potentially large volume of insolvency proceedings in Korea.

Debtor Involvement

13. Korean laws are inconsistent on removal of incumbent management of the debtor. Under the liquidation procedure of the Bankruptcy Act and the court-supervised rehabilitation procedure of the Corporate Reorganization Act, the incumbent management is removed by a court appointed administrator/receiver. By contrast, in a composition under the Corporate Restructuring Act, incumbent management remain in place. And, under the Corporate Restructuring Promotion Act, incumbent management can be removed by the creditors' committee even before the plan is "agreed" among the creditors and the debtor company.

14. Skepticism about the involvement of incumbent management is justified given the record of corporate governance practices in Korea. These concerns, however, should be balanced by other considerations. First, where the law provides a blanket rule of ejection, incumbent management have a strong incentive to forestall or frustrate insolvency proceedings, which will often further undermine the chances of a successful rehabilitation. Second, the "trustee" model in Korea places inordinate reliance on the availability of suitable professionals to manage the debtor's businesses during the insolvency proceedings.

15. The self-interest of management can be leveraged positively by providing management with a qualified right to operate the business. The law could provide for a specified exclusivity period in which the debtor can propose a rehabilitation plan, thereby encouraging the debtor to take early initiative. However, the conduct of management should be subject to oversight by a trustee and recourse to the courts where there is fraud or mismanagement. Further, the law could provide for mandatory grounds for debtor filing of insolvency proceedings and for liability for directors in "trading while insolvent." Violation of the mandatory filing requirements would be a factor in removal of management during the insolvency proceedings.

Creditor Involvement

16. Two reforms would help optimize creditor involvement in the insolvency proceedings. First, the law could provide that the reasonable costs incurred in the operation of creditors' committees (including the retention of professionals advisors) shall be borne by the debtor's estate as an administrative expense. Such a rule would encourage more effective creditor participation. Second, upon the expiration of the period in which the debtor has the exclusive right to propose a plan, creditors could be allowed to propose their own rehabilitation plan.

Law of Secured Transactions

17. The Korean law of secured transactions apparently derives from German law. Under the German law model, the possessory pledge is the only recognized security interest in personal property (i.e., property other than land and fixtures on land). Because creation of a possessory pledge requires the transfer of the collateral to the creditor, the possessory pledge is of limited commercial utility when the collateral comprises assets used in the operation of the debtor's business. A consequence of the legal limitation on creating security interests is that it prevents collateralization of valuable assets such as inventory and accounts receivables. Such a legal framework encourages an over-reliance on real estate collateral. This is the case in Korea, even though the value of real estate typically falls significantly short of covering the debt. These legal factors appear to have contributed to indiscriminate lending practices in Korea.

18. Modern German law, as demanded by a market-driven economy, has developed quasi-security interests in personal property (such as the fiduciary transfer of title) that have overcome the traditional limitations of that law. Korean law, however, has not moved in this direction. Reform of the law of secured transactions will therefore need to be a high priority.

19. The capacity to enforce the security interest is a critical element in the value of collateral. Specifically, swift and efficient foreclosure on collateral is vital. The effectiveness of such foreclosure proceedings depends on the operation of the court system. In Korea, the judicial procedure by which collateral is auctioned involves substantial delay. Such delay in effect deprives the creditor of the commercial value of the security interest. In particular, the practice of debtors (and their associates) in repeatedly filing appeals that automatically stay the auction procedure will need to be curtailed.

20. Improvements in the law of secured transactions and in the enforcement mechanisms would have a substantial cross-benefit to the Korean insolvency regime. It would support the *ex ante* differentiation of good and bad companies (in credit-risk terms) and provide an efficient alternative to insolvency proceedings for the recovery of credit claims.

The Court System

21. The effectiveness of the court system is fundamental to the operation of the insolvency regime. This point is valid whether the insolvency resolution either takes place directly in the courts or in an informal workout conducted in the shadow of the court system. As is the case with most jurisdictions across the world, it appears that the resources of the Korean court system are not sufficient to ensure the timely disposition of commercial cases. The initiative of the Korean government in establishing exclusive bankruptcy judges, six in Seoul and in three each in four other major cities, is welcome. This reform is appropriate in expediting the resolution of insolvency cases and in enhancing the quality of judicial determinations in those cases. Further streamlining of court procedures should be possible. For example, an extension of the three year service period in bankruptcy court of judges that have acquired expertise in insolvency matters would be beneficial.

C. Conclusion

22. The partial reforms of the insolvency system over the last four years did not go far enough, and getting the basis legal framework right will be indispensable to overcome the weakness in the corporate sector and support the development of a more market-driven economy. It is most encouraging that the Korean government recognize the need for further insolvency law reform, and that it has formed a task force to make proposals for such reforms. It is notable that the issues presented in the reform of insolvency laws are not unique to Korea. There is a wealth of comparative law experience out of which "best practices" in the design and implementation of insolvency law have evolved. Drawing on this experience, this paper has offered some preliminary guide posts on the critical issues that will need to be considered as this reform process moves forward. The recent reforms of German insolvency law may also provide some useful analogues for Korea.