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REPUBLIC OF KOREA

Selected Issues

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Approved by the Asia and Pacific Department

August 17, 2007

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EXECUTIVE SUMMARY

With Korea's near-term economic prospects strong and risks modest, this year's four Selected Issues papers focus primarily on addressing longer-term challenges. Korea is experiencing solid growth with low inflation and vulnerabilities to potential shocks appear low. Looking ahead, however, Korea is set to age rapidly, with enormous implications for fiscal policy. Moreover, Korea faces serious medium-term challenges to its competitiveness. Finally, while the Korean financial sector is in good health, further development will be critical in sustaining growth and taking full advantage of the globalization of capital markets.

Chapter I analyzes long-term fiscal challenges from aging. With Korea aging at an almost unprecedented rate, spending on pensions, health and long-term care could rise by as much as 11 percent of GDP over the long term, threatening fiscal sustainability. Making use of the Fund's Global Fiscal Model, the chapter finds that the key to successfully addressing this challenge is to act early and with a range of policy tools, including tax base broadening, improved tax administration and pension reform.

Chapter II examines Korea's global competitiveness, with a particular focus on challenges presented by Japan and China. Korea has maintained its position as an export power in recent years, primarily by raising productivity and specializing increasingly in high-skill products. However, a sharp appreciation of the won, in particular relative to the yen, is pressuring bottom lines in a number of industries, while China is rapidly evolving from a production platform for Korea—and Asia more generally—into a competitor in global trade. Responding to these challenges will require progress on a range of structural reforms.

Chapters III and IV examine two aspects of financial development:

- Korea has been moving to liberalize its foreign exchange market and deregulate its financial system, with a view to creating a regional financial hub. In this context, Chapter III examines efforts being made to internationalize the Korean won and weighs the potential benefits and risks of such a development. The chapter concludes that some increase in the international use of the won may be forthcoming as a natural consequence of financial development—and that such an outcome would be welcome—but that this should not be pursued as an independent policy objective.

- While risks facing financial institutions appear quite manageable, the authorities have been focused on risks to the highly-indebted household sector. In particular, concerns related to a potential housing bubble have generated a number of measures to suppress housing prices, including a tightening of prudential standards for mortgage loans. However, as emphasized in Chapter IV, a more effective approach to housing-related risks over the medium term will hinge on continued development of the mortgage market and, in particular, long-maturity and fixed-rate mortgages. The Korean Housing Finance Corporation can play an expanded role in this regard.

I. Achieving Long-Term Fiscal Sustainability in Korea[1]

A. Introduction

1. **Korea will confront a number of fiscal challenges in coming decades, notably accommodating spending pressures brought on by rapid population aging.** As Korea undergoes a dramatic transformation from a relatively young population to one of the oldest, spending on the elderly—in the form of pensions, health care and long-term care—is, absent any adjustment, projected to increase by almost 11 percent of GDP over the next 50 years. In addition, the government's desire to increase social safety net spending to average OECD levels by 2030 and potential cost from reunification with North Korea may also put strains on the budget.

2. **This paper simulates the impact of age-related fiscal pressures on Korea's economy and discusses options for addressing them in a sustainable manner.** As the authorities are well aware, the current fiscal stance is not sustainable. The fiscal pressures will not show in the near term as the pension system continues to accumulate assets. However, in the absence of offsetting measures, as age-related spending pressures mount in the long term, both the fiscal deficit and public debt would balloon and the external current account deficit would grow rapidly. Our analysis suggests that the preferred approach to addressing these pressures would likely involve efforts on a number of fronts, including tax base broadening, improved tax administration, pension reform, and expenditure reallocation. Moreover, the earlier these measures are taken, the lower the adjustment costs.

B. Demographic Change and Related Fiscal Pressures

3. **In the coming decades, the demographic structure of Korea is expected to undergo significant changes.** The fertility rate—having fallen sharply from around 6 in 1960 to just over 1—is among the lowest in the world and life expectancy will increase by about 8 years over the next 45 years (UN, 2004). As a result, the working-age population is projected to decline by about 30 percent, while the elderly population is expected to expand by more than 240 percent. These changes imply an extraordinary large increase in the old-age dependency ratio from about 15 to 65 percent. Although population developments in the G7 countries show similar patterns, the magnitude of the changes is much less pronounced, with this ratio increasing on average from 25 to 45 percent.

4. **Given the demographic outlook, it is estimated that—absent any adjustment—public age-related expenditures will increase by as much as 11 percent of GDP over the next half century.** Aging is expected to lead to a sharp rise in pensions (including occupational pensions)[2] of

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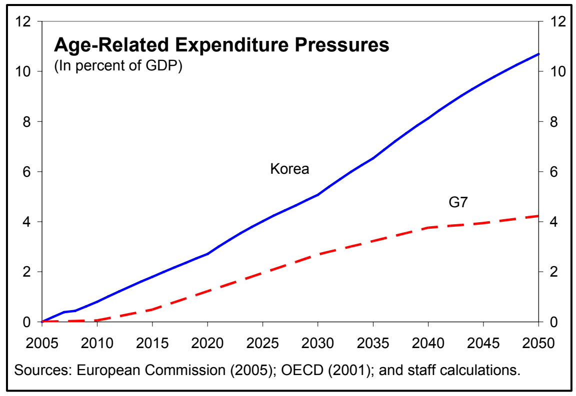
[1] Prepared by Tarhan Feyzioğlu, Michael Skaarup, and Murtaza Syed.

[2] In addition to the National Pension System, separate occupational pension schemes operate for government employees, private teachers and military personnel, and currently insure around 8 percent of the labor force.



some 4-5 percentage points of GDP[3], and a rise in health and long-term care expenditure of 6-7 percentage points of GDP (OECD, 2006; Yun, 2005). Because of the severity of population aging in Korea, the total projected increase is almost three times that in the average G7 economy.

5. **Korea has a number of options to ensure fiscal sustainability in the face of these spending pressures.** The government recently passed a limited pension reform and is also considering steps to broaden the tax base and improve tax administration. Further changes to the pension system will also be needed. In addition, reforms could be implemented in the health care sector and non-age-related expenditure growth could be restrained.

C. Applying the Global Fiscal Model to Korea

6. **The GFM is a dynamic general equilibrium model designed to examine fiscal policy issues.**[4] The GFM analyzes the impact of fiscal policy on real activity through both aggregate demand and supply channels. Aggregate demand responses result from the absence of debt-neutrality and consumers' impatience, and aggregate supply responses arise from the distortionary effects of taxation. The model is calibrated to reflect the macroeconomic features of Korea. Several alternative scenarios are simulated and, while the precise permutations are largely illustrative, a number of interesting results emerge.

7. **The model confirms that, without adjustment, the fiscal position will not be sustainable.** Under staff's baseline, in the absence of any adjustment, the fiscal deficit increases steadily, reflecting debt-financed expenditure increases and growing interest payments, and the debt-to-GDP ratio enters an unsustainable upward trend (Figure I.1). This fiscal stance leads to other imbalances, as strong private consumption and investment growth, supported by large public spending, leads to a ballooning external current account deficit. The next 15 years look deceivingly stable, as the accumulation of assets in the pension fund allows public debt to remain below 50 percent of GDP while the fiscal deficit (excluding social security funds) remains modest. Moreover, rising fiscal expenditures raise GDP growth, employment, and wages. But, these developments mask the underlying pressures stemming from demographic changes. Since sufficient assets are not accumulated to pay for future expenditure, and structural reforms are not implemented to reduce

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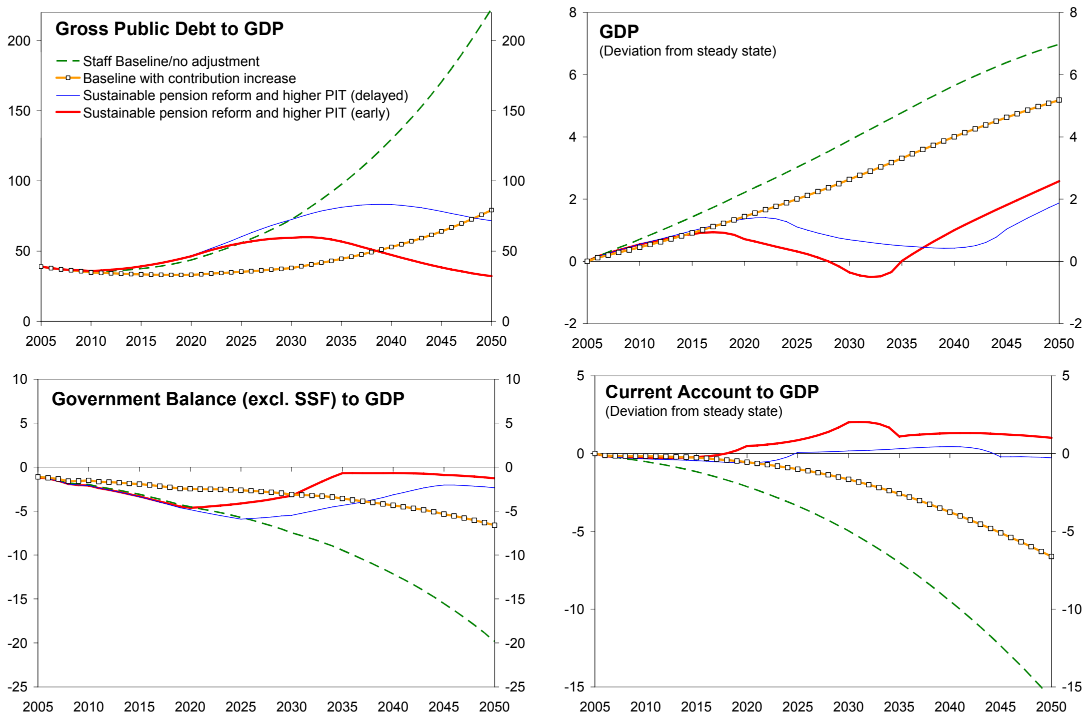
[3] Based on Feyzioğlu (2006), Gruenwald (2003) and Moon (2003), adjusted to include the effects of the recent pension reform bill, which is discussed later.

[4] See the Appendix for a more detailed description of the model.

expenditure pressures, increasing pension and health care expenditures push the fiscal balance into substantial deficit over the long term, with adverse consequences for long-run growth (which would enter a downward trajectory starting around 2060, with similar declines in consumption and investment).

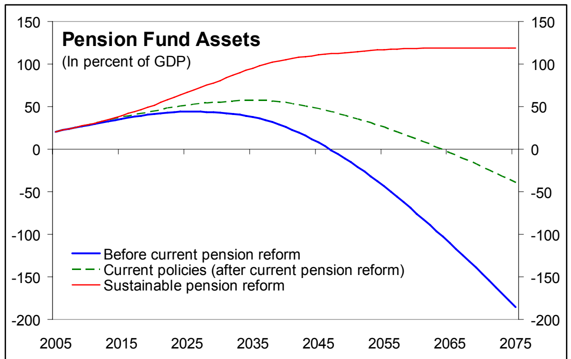
Figure I.1. GFM Simulations: Basic Results 1/



Sources: Fund staff estimates and projections.
1/ See text for details of the scenarios.

8. **Another possible representation of the baseline, based on hikes in health care contributions, would lower the projected long-term debt level but still place it on a upward trajectory.** Since the subsidy element of health care spending is limited to 20 percent by law, hikes in contributions could help to finance a large part of the anticipated rise in health care costs. Based on the assumption that the required increases in contributions take place, gross public debt remains lower, at around 80 percent of GDP in 2050, than the more than 200 percent under the previous scenario. However, these increases would still require discretionary action and would need to be large, rising from 3 percent of GDP now to 8 percent of GDP by 2050. Moreover, the consequences for the fiscal and current account deficits and growth in the long run, while somewhat less pronounced, would remain severe.

9. **The recently passed pension reform bill delays, but does not resolve, the problem.** Korea's National Pension Fund (NPF) is very young, having been introduced in 1988, and its assets will continue to be built up over the medium term, peaking in the mid-2030s.[5] However, as the number of pension recipients increases, its assets are projected to diminish rapidly. The recently passed pension reform bill will gradually reduce the pension benefit replacement rate from the current 60 percent of wages to 40 percent by 2028, but does not raise the contribution rate from its current 9 percent (Ministry of Finance, 2007). As a result, the assets of the pension fund will still be depleted, but about 15 years later than the pre-reform date of 2047. While the new replacement rate will be relatively low, Korea has, together with Australia, the lowest contribution rate among OECD countries, and the retirement age in Korea is also well below the OECD average.



Sources: Korean authorities and Fund staff estimates.

Pension Parameters in Selected OECD Countries

	Contribution rate	Retirement age	Replacement rate 1/
Australia	9.0	65	52.4
Belgium	16.4	65	63.1
Finland	22.9-33.0	65	78.8
France	16.4	60	68.8
Germany	19.5	65	71.8
Greece	20.0	65	99.9
Italy	32.7	65	88.8
Japan	13.6	65	59.1
Korea	**9.0**	60	**44.3**
Mexico	11.3	65	45.1
Netherlands	25.8	65	84.1
Norway	21.9	67	65.1
Spain	28.3	65	88.3
Sweden	18.5	65	68.2
United Kingdom	23.8	65	47.6
United States	12.4	67	51.0
Average	19.8	64.5	68.7

Source: OECD (2005).
1/ Net replacement rates on average earnings in mandatory pension programmes.

[5] Payment of regular old-age pensions will only begin in 2008, once the initial participants meet the minimum 20 years of contributions.

10. **Extending pension reform, for example by raising contribution rates, could put the pension fund on a sustainable footing.** For instance, a rise in contribution rates from 9 to 18 percent over the period 2011–30 would ensure stabilization of pension fund assets at a positive level and a continuation of surpluses on the pension fund balance. Smaller increases would be required to the extent that the payroll tax base could be broadened or the return to equity enhanced.[6,7] With this type of pre-funding strategy, a large part of the pension expenditure increases will be financed by the returns on the pension fund assets.[8]

11. **In addition to a sustainable pension reform, more measures would likely be needed to address increased pressures on health and long-term care expenditure.** Assuming that the pension reform is implemented in a sustainable way, rising health care costs are still projected to increase the fiscal deficit, especially after 2025. Without measures to raise revenues, reform the health sector or contain other expenditure, the fiscal deficit would likely remain on an unsustainable path.

12. **One option is to raise revenue to prevent fiscal deficits from widening** (Figure I.1). As discussed below, there appears to be considerable scope to raise tax revenues in Korea, in particular via base broadening. One strategy could be to start raising tax revenues—either through base broadening or by raising tax rates—only when the fiscal surplus (including the social security fund) is eliminated, which will shift costs to the next generation. To model this, the effective personal income tax (PIT) rate is assumed to increase gradually starting in 2025 to maintain fiscal balance.[9] This requires the effective PIT rate to rise by a cumulative 9 percentage points in 20 years. Under these assumptions, public debt stabilizes at around 70 percent of GDP, and a positive pension fund asset position is maintained. However, higher taxes lead private consumption and investment to decline over the medium term relative to staff's baseline.[10]

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[6] For example, our analysis suggests that if the payroll tax base is broadened by 30 percent during 2008–20, the increase in the contribution rate needed to ensure pension sustainability could be limited to 4 percentage points (from 9 to 13 percent, phased in during 2010–25). Presently, although coverage is notionally universal, only 60 percent of the labor force contributes to the national pension system (compared to around 85 for the OECD as a whole), largely reflecting the large number of self-employed and non-regular workers.

[7] While we only consider parametric reforms to the pension system, other options exist, such as increasing labor force participation of older workers and women, moving towards a defined contribution system, or improving the investment strategy of the system's assets.

[8] To limit potential concerns about political interference in the allocation of the pension system's assets, the governance and investment policies underpinning their management would need to be carefully designed.

[9] Base broadening cannot be distinguished from rate increases in the GFM, except in the case of payroll taxes. Hence, our simulations reflect increases in the *effective* tax rate, which could reflect either of the two.

[10] This deterioration is not reflected in the GDP figures because increasing government expenditure raises GDP.

13. **Long-term costs to the economy could be lowered by raising taxes earlier and/or faster.** Early action is preferable, given the unprecedented speed at which Korea is aging and the additional long-term pressures on its public finances, notably from increased social safety net spending and potential reunification.[11] As an illustration, if tax increases are brought forward and accelerated even slightly, so that the effective tax rate is allowed to increase continuously from 2021 until 2035, the effective PIT rate hike could be limited to 7½ percentage points. Relative to the previous scenario, the government maintains a comfortable overall surplus, and the current account remains in surplus due to interest returns on foreign assets. With the long-run effective tax rate lower when early action is taken, long-run GDP growth is also higher as both consumption and investment are raised.

14. **The type of tax increase also matters** (Figure I.2, Panel A). For instance, an effective VAT increase instead of a PIT increase would reduce distortions, and therefore lower the adverse impact of higher taxes on private consumption.[12] For instance, with a gradual rise in the effective VAT rate of 9 percentage points from 2010 until 2025, the decline in private consumption is less than one-fifth, and GDP growth almost doubled, relative to the case of an increase in the effective PIT rate. However, the choice between the PIT and VAT hike is likely to depend on equity as well as efficiency considerations.

15. **An alternative is to restrain expenditure growth** (Figure I.2, Panel B). This could take the form of cost efficiency gains from health care reform or measures to restrain non-age-related expenditure growth. We consider a scenario where, in addition to the sustainable pension reform, total expenditure growth is reduced by 4 percentage points of GDP over the period 2011–25, offsetting about half of the baseline increase in health and long-term care expenditure under staff's baseline. The results again show that early action makes a significant difference. Cost saving measures implemented in the next 15 years could put the fiscal stance on a sustainable path without an increase in taxes, because the return on assets accumulated early on would help pay later for the increased health care costs. The macroeconomic implications are also positive: domestic consumption and investment recover and the current account remains in surplus. However, relying solely on expenditure cuts is probably not feasible, as public spending in Korea is relatively low and additional long-term spending pressures, for higher social safety net spending and potential reunification with North Korea, are looming.

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[11] There may be other arguments in favor of timely action, including political economy considerations, as the elderly will soon represent the majority of the voting public, making it potentially more difficult to implement some reforms; and the possibility that capital markets may anticipate the consequences of long-term pressures and impose penalties—in the form of lower debt ratings, limited access to capital or higher borrowing costs—if they perceive that the government has not done enough to address these concerns.

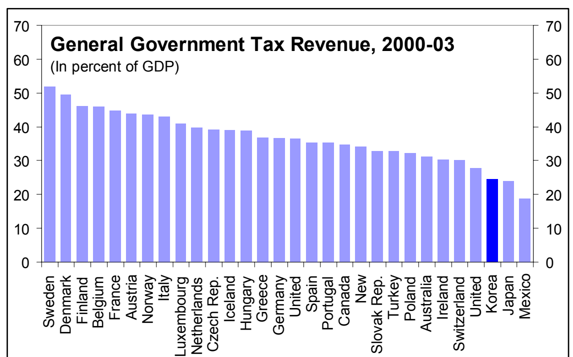
[12] This order of efficiency is consistent with evidence from various international studies—see Baylor (2005) for a survey—as well as results of a general equilibrium model for the Canadian economy (Department of Finance, 2004). See Baylor and Beauséjour (2004) for a detailed description of the model and a demonstration that the conclusion is robust under alternative values for important model parameters.

16. **Finally, the government may prefer to implement a combination of more modest policies in each of the areas mentioned above** (Figure I.2, Panel C). This could be particularly attractive if making large reforms in any one area would be difficult politically. A combination of higher taxes and expenditure restraint is considered, consisting of a pension contribution rate hike together with some payroll base broadening; limited hikes in the effective VAT and PIT rates; and a slowing of non-age-related expenditure growth.[13] Combining these policies does not change the main conclusions: as long as the fiscal stance is put on a sustainable path at an early stage, consumption and investment recover, GDP picks up, and the current account registers a moderate surplus relative to the baseline.

D. Policy Options for Achieving the Required Fiscal Adjustment

17. **While the GFM provides insights into the scope of the fiscal challenges that Korea faces and suggests broad solutions, this section discusses more concrete policy responses.** Unlike most other aging economies, Korea benefits from relatively high rates of economic growth, considerable scope for increasing tax revenue, and a low level of public debt. This provides more degrees of freedom in dealing with age-related fiscal pressures, and some specific recommendations are discussed below, in addition to pension reform.

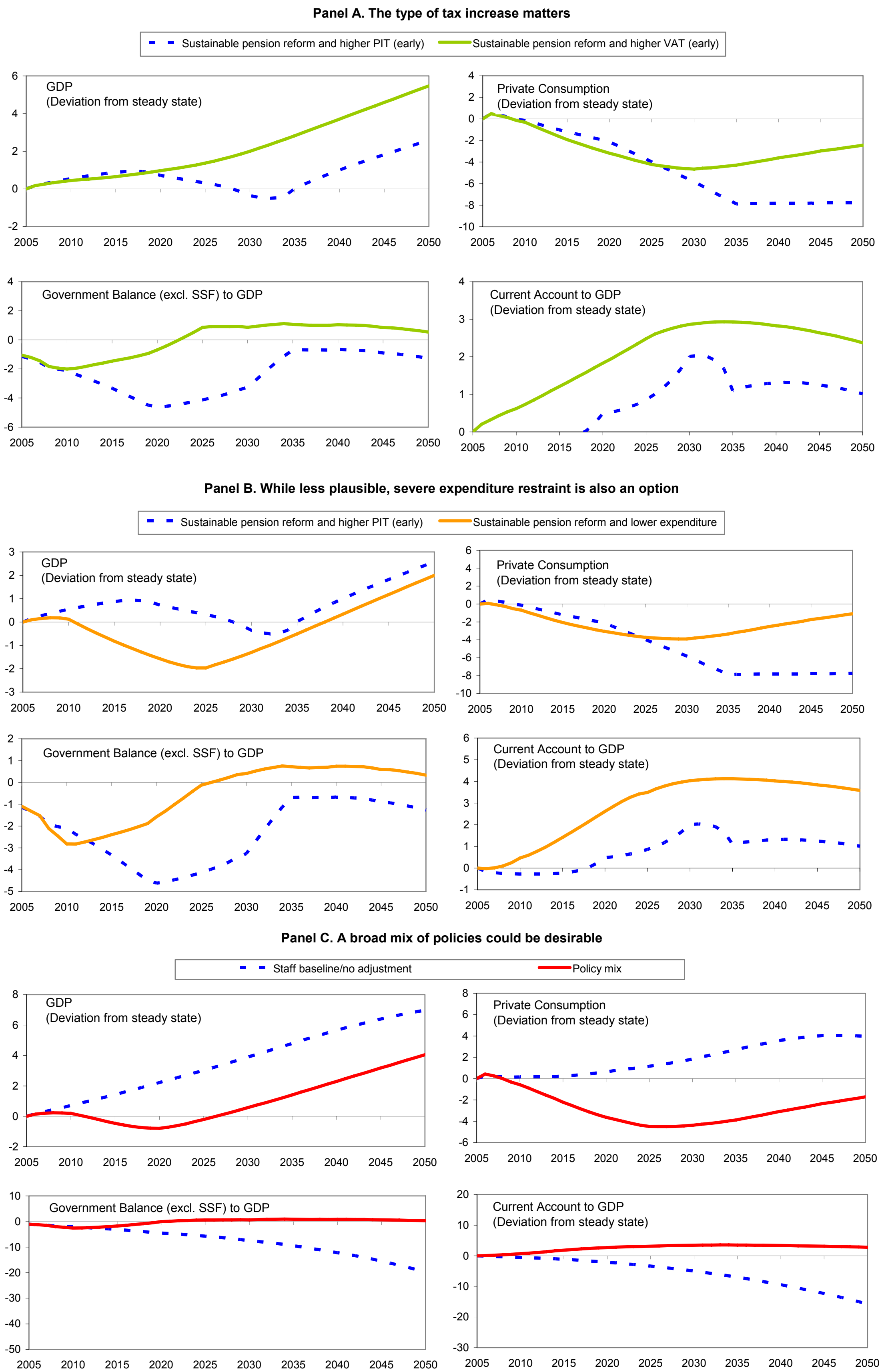
18. **First, there is considerable scope to boost tax revenue collections to accommodate Korea's future spending needs.** At around 25 percent, the revenue-to-GDP ratio is low relative to most OECD countries. For all major taxes in Korea, there is considerable scope for increasing the resource envelope through base broadening, even without increases in tax rates. Key options include:



Source: OECD, *Revenue Statistics Database*.

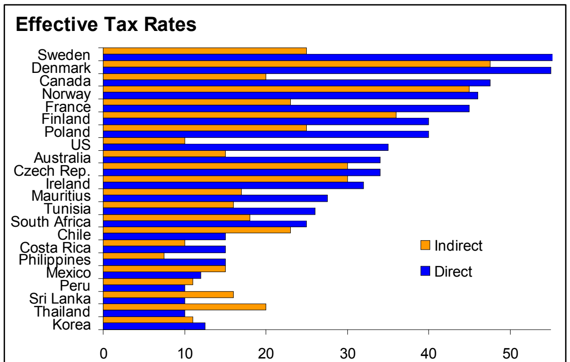
[13] More specifically, the scenario assumes a payroll base broadening of 30 percent during 2008–10 followed by a pension contribution rate hike from 9 percent to 13 percent during 2010–25; an effective VAT rate increase of 4 percentage points during 2011–20 and an effective PIT rate increase of 2 percentage points during 2016–25; and a cut in total expenditure growth of 1.5 percentage points of GDP during 2011–20.

Figure I.2. GFM Simulations: Further Results



Sources: Fund staff estimates and projections.

- *Personal income tax (PIT).* While personal income tax rates are broadly in line with those in most countries, PIT yields are very low. In Korea, PIT revenue accounts for roughly 3 percent of GDP and 14 percent of total tax revenue, compared to an OECD average of 10 and 26 percent, respectively. A key reason for this divergence is that relatively few people in Korea pay PIT: in 2003, the bottom 80 percent of wage and salary employees in the tax system accounted for only 10 percent of taxable income, while the bottom half had virtually no taxable income. This partly reflects the large number of allowable deductions—including for insurance premiums, medical expenses, and education expenses—which are not subject to an overall ceiling and are estimated to have reduced the potential tax base by nearly 43 percent of wage and salary income. Capping these wage deductions would broaden the PIT tax base. Moreover, it is suspected that many employees, particularly self-employed and non-regular workers, do not file returns or understate incomes.[14] In this context, improving tax administration by intensifying the auditing of the self-employed and strengthening penalties for misreporting income could also help.

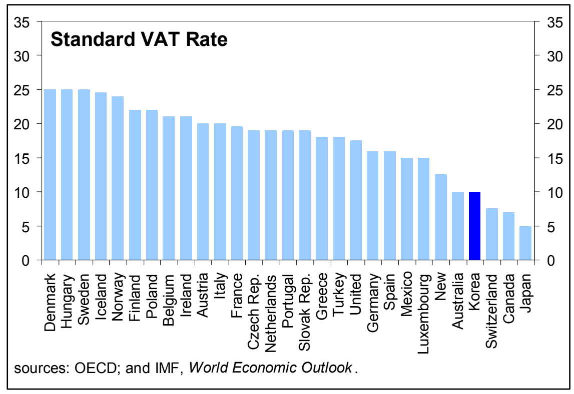


Source: IMF, *World Economic Outlook*.

- *Corporate income tax (CIT).* Corporate income tax is a core source of revenue in Korea, accounting for 3 percent of GDP or 14 percent of total taxes, the latter the fourth largest among OECD countries. However, over coming years, global pressures to lower statutory rates of corporation tax are likely to also be felt in Korea. This makes it important to safeguard this source of revenue by limiting tax incentives. In this context, honoring sunset provisions that exist for the elimination of various CIT incentives and introducing similar clauses for other special schemes would help. In addition, publishing on a regular basis ex post estimates and projections of tax expenditures would enhance fiscal transparency and contribute to the public debate on the use of tax exemptions.

[14] Unlike employees, self-employed workers must pay the full 9 percent contribution rate themselves, so that evasion is more attractive. With nearly two-thirds of Korea's labor force either self-employed or working as day laborers, unpaid family workers or short-term irregular employees, enforcing compliance is extremely difficult.

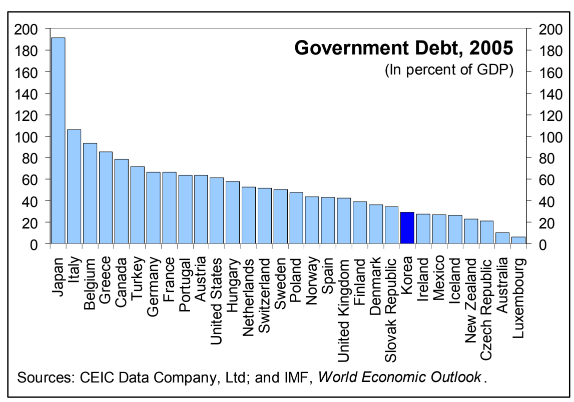
- *VAT and excises.* Korea makes relatively heavy use of consumption taxes, which raise over one-third of all tax revenue. However, the VAT rate of 10 percent compares to an OECD average of around 18 percent, and the VAT yield is around 4½ percent of GDP, compared with the OECD average of 7 percent. While the Korean VAT is well designed, base broadening in line with international best practice could be a potentially significant source of additional revenue. In the longer run, when gains from base broadening are exhausted, consideration could also be given to raising the VAT rate.



The authorities' own preliminary plans, as described in their draft *Directions for Tax Reform,* are broadly in line with these recommendations.

19. **Second, although the scope for expenditure-based responses appears more limited, greater efficiency and discipline with respect to non-age-related spending would also help.** About 40 percent of total central government expenditure is non age-related in the median OECD country, compared to nearly 75 percent in Korea. In particular, Korea allocates a relatively large share of GDP to public investment and economic affairs.[15] However, the scope for expenditure re-allocation remains limited—in particular as public spending is already relatively low in Korea and spending increases for the social safety net, and possibly for reunification with the North may eventually be required.

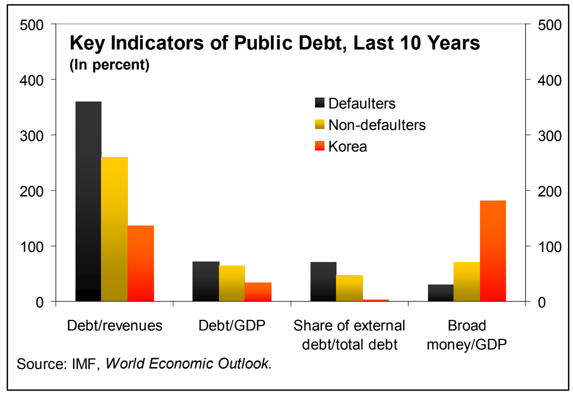
20. **There may also be some room for a limited rise in the debt-to-GDP ratio over the longer run.** At around 33 percent of GDP, Korea's public debt ratio is relatively low by OECD standards.[16] The government is justifiably keen to keep debt at around its current level ahead of the onset of the full effects of aging and given other long-term expenditure pressures, such as those related to potential reunification. However, as



[15] According to the OECD, public investment accounts for around 8 percent of GDP for the general government compared to 3 percent of GDP in the average OECD economy. Spending for economic affairs accounts for around 6 percent of GDP compared to the OECD average of about 4 percent of GDP.

[16] In emerging market economies, the average public debt ratio is currently around 70 percent of GDP.

spending pressures build, some rise in the debt-to-GDP ratio may become inevitable. While debt sustainability depends on a number of factors and needs to be carefully evaluated, international experience suggests that on average, countries with a low ratio of debt relative to GDP and revenues, a low proportion of external debt, and better-developed financial systems tend to be less susceptible to debt crises. On all these metrics, Korea currently performs well so that a modest rise in the debt level over the long term could likely be accommodated without a significant increase in vulnerabilities. At the same time, ongoing efforts to improve debt management, notably the implementation a five-year debt management plan, should continue.



21. **Finally, publishing a regular long-term fiscal report, as in several other OECD countries, could help address long-term challenges in a comprehensive manner.** A number of economies confronting population aging pressures, including Australia, New Zealand and the United Kingdom, routinely publish reports assessing risks to long-term fiscal sustainability, covering horizons of 30 to 50 years. Similarly, the European Commission publishes a comprehensive aging report for all EU member states, assessing fiscal sustainability, on an annual basis. Such reports can help to stimulate public debate and create an awareness of looming pressures that weigh on the conduct of fiscal policy, making it easier to build consensus on needed reforms.

E. Conclusion

22. **A number of important policy implications emerge.** First, the debt path without fiscal adjustment is unsustainable. Second, while Korea benefits from favorable initial conditions compared to other economies facing age-related fiscal pressures, the unprecedented speed of its demographic transition and the confluence of long-term fiscal pressures that it faces leave a relatively narrow window of opportunity. Third, addressing Korea’s long-term fiscal challenges will necessitate reform in a number of areas: in addition to pension reform, there is considerable scope for fiscal consolidation by increasing tax revenue, and some room for raising spending efficiency and reducing non-age-related spending as well as perhaps for some limited debt build-up, in tandem with further improvements in debt management. Building consensus for these reforms will not be easy, but the publication of a regular long-term fiscal report would help to communicate the underlying fiscal pressures to the public.

Appendix: The Global Fiscal Model

1. **The GFM is a four-country dynamic general equilibrium model based on the New Open Economy Macroeconomics (NOEM) tradition.**[1] The GFM extends the NOEM framework by introducing non-Ricardian features via three distinct channels to allow for thorough fiscal policy analysis:

- Households have finite horizons. As a result, even temporary changes in fiscal policy affect consumption patterns since any offsetting action required by the government's intertemporal budget constraint is (perceived to be) borne by future generations and there is no bequest motive.
- A fraction of households are liquidity-constrained and consume all their disposable income every period and thereby immediately respond to fiscal policy initiatives that change their disposable income.
- Labor and capital taxes affect incentives to consume and invest and thus are distortionary.

2. **The model has a number of other features consistent with general equilibrium models.** Consumption and production are characterized by constant elasticity of substitution functions, and firms and workers have some market power so that prices and wages are above their perfectly competitive levels. Both traded and non-traded goods are modeled to allow for a bias toward domestic goods in private or government consumption. Capital and labor are the two factors of production and are used to produce traded and non-traded goods. Capital and labor can move freely between sectors, but are not mobile internationally. Investment is driven by Tobin's Q with adjustment costs. Firms respond sluggishly to differences between the discounted value of future profits and the market value of the capital stock. There are two kinds of financial assets, government debt (traded internationally) and equity (held domestically). International trade in government debt implies the equalization of nominal interest rates across countries over time. However, real interest rates across countries could differ because of the presence of non-traded goods and home bias in consumption.

3. **The GFM provides a good platform for discussing the relative merits of alternative fiscal consolidation measures and has been applied to several countries.** The non-Ricardian structure of the model implies empirically plausible responses of key macroeconomic variables to changes in fiscal policy. The wide-ranging menu of taxes allows a detailed analysis of the composition of adjustment while the strong micro foundations allow consideration of the fundamental determinants of the effects of fiscal policy, such as the response of consumers and producers to changes in fiscal policy as well as the sensitivity to the structure of the economy.

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[1] See Botman and others (2006) for a detailed description of the GFM.

4. **The model is calibrated to reflect the macroeconomic features of Korea** (Table I.1). In particular, the ratios of consumption, investment, government spending, wage income, and income from capital relative to GDP are set to their current values. Similarly, key fiscal variables—revenue to GDP ratios from taxation of corporate, labor, and personal income and consumption tax, as well as government debt and current government spending—have been calibrated to Korea's fiscal structure. Also, the calibration reflects the trading patterns between Korea, the Euro Area, United States, and the rest of the world.

5. **The preliminary calibration of behavioral parameters is based on microeconomic evidence found in the literature** (Table I.2).[2] These include parameters characterizing real rigidities in investment, markups for firms and workers, the elasticity of labor supply to after-tax wages, the elasticity of substitution between labor and capital, the elasticity of intertemporal substitution, and the rate of time preference. In particular, the following calibration method was used:

- The baseline value of the sensitivity of labor supply to the real after-tax wage is equal to -0.05, which is at the low-end of those found by microeconomic studies.
- The elasticity of substitution between labor and capital in the production function equals -0.75.
- The baseline value for the elasticity of intertemporal substitution is 0.33. This parameter describes the sensitivity of consumption to changes in the real interest rate.
- The wedge between the rate of time preference and the yield on government bonds determines consumers' degree of impatience and has not been subject to extensive microeconomic analysis. We have set the baseline value of the wedge to 4 percent (corresponding to a planning horizon of 25 years).
- The baseline assumes that 40 percent of consumers are liquidity constrained (i.e., excluded from participating in financial markets). As these consumers have no wealth, these households consume a quarter of aggregate consumption.
- The baseline assumes that the markup over marginal cost in the tradables sector equals 11 percent and in the nontradables sector equals 14 percent.
- The baseline expenditure projections are based on the assumption that all non-age-related expenditure remains constant in percent of GDP. In addition, pension expenditure increases according to Moon (2003), and health care and long-term care expenditure gradually increases (linearly, and broadly in line with the change in old-age dependency ratio) from the current level to the level predicted by OECD (2005) by 2060.

[2] Other structural parameters have been calibrated using evidence from Laxton and Pesenti (2003) and Batini and others (2005).

Table I.1. Korea: Key Macroeconomic Variables in the Initial Steady State

National expenditure accounts at market prices

Expenditure ratios		Factor Incomes	
Consumption	55.6	Capital	44.1
Government consumption	14.8	Labor	55.9
Investment	26.7	Government	
Exports	41	Net debt	18.4
		Gross debt	36.4

Tax rates and revenue

Payroll taxes (worker and employer)		On personal income	
Effective	5.5	Effective	3.7
As percent of GDP	4.6	As percent of GDP	3.3
On corporate income		On consumption	
Effective	15.5	Effective	8.3
As percent of GDP	3.4	As percent of GDP	4.7

Trade flow matrix

	Korea	Euro area	United States	Rest of the world
GDP (percent share of world nominal output)	3.0	27.0	30.0	40.0
Total exports	41.0	25.0	15.0	20.0
To Korea	...	1.0	0.6	1.0
To Euro area	11.4	...	9.0	2.7
To United States	12.2	10.3	...	0.3
To rest of the world	17.4	13.7	10.0	...

Source: IMF staff estimates.

Table I.2. Korea: Behavioral Assumptions and Key Parameters in the Initial Steady State

Planning horizon of consumers	25 years
Labor disutility parameters	0.95
Fraction of rule-of-thumb consumers	0.40
Intertemporal elasticity of substitution	0.33
Elasticity of substitution between capital and labor	0.75
Depreciation rate on capital	
Capital adjustment cost parameters	0.50
Elasticity of substitution between varieties	
Tradables sector	10.00
Price markup over marginal cost	1.11
Nontradables sector	8.00
Price markup over marginal cost	1.14
Capital share in production tradables sector	0.58
Capital share in production nontradables sector	0.58
Utility from real money balances	0.02
Price stickiness parameters	0.00
Home bias in government consumption	Yes
Home bias in private consumption	No
Elasticity of substitution between traded and nontraded goods	0.50
Bias towards domestically produced tradable over nontradables	0.40

Source: GFM simulations.

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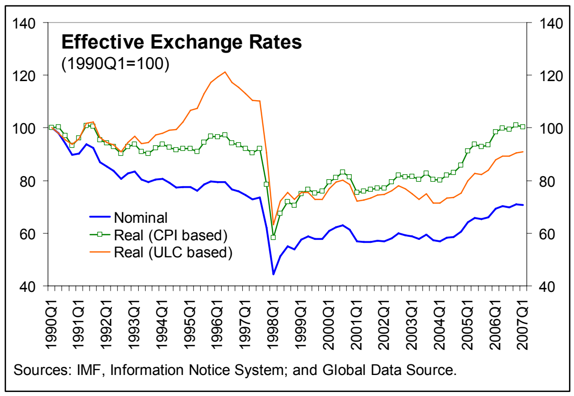
II. KOREA'S COMPETITIVENESS IN THE GLOBAL MARKETPLACE[1]

A. Introduction

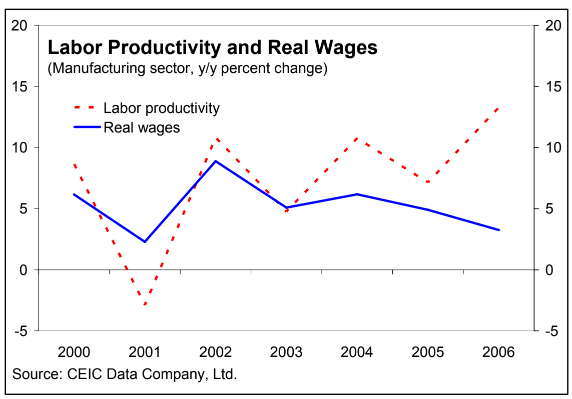
1. **Despite continued strong export performance, concerns have been raised recently about Korea's competitiveness.** Exports have recorded double-digit growth for the past four years, benefiting from Asia's growing trade and production links. At the same time, the won has appreciated by 20 percent in real effective terms since end-2004, among the highest in emerging Asia. Coupled with rising oil prices, this is squeezing the profit margins of some Korean companies, including those in key export sectors. In addition, competition with China and other low-cost countries is eroding Korea's industrial base, as companies are moving some of their operations overseas, resulting in stagnant investment and lower employment in manufacturing. Korea is perceived by some as being "sandwiched" between China, its key trading partner, which is catching up rapidly in terms of product technology, and Japan, its major export competitor, which is still technologically more advanced. This paper provides an assessment of Korea's external competitiveness, focusing in particular on challenges posed by China and Japan, and offers some policy recommendations.

B. Exchange Rate and Competitiveness

2. **Despite a steady appreciation of the won in recent years, Korea's external competitiveness has remained strong.** Since end-2004, the won has strengthened significantly against major currencies and in real effective terms. Nevertheless, exports reached $332 billion in 2006, making Korea the world's 11th largest exporter, while the nation's share of world exports has remained steady at about 3 percent over the same period. CGER-type analysis suggests that the exchange rate remains broadly in line with fundamentals, with estimates of the deviation of the won from its equilibrium ranging between -4 and +14 percent, depending on the methodology for exchange rate assessment. The won appreciation is also consistent with Korea's strong labor productivity growth



Sources: IMF, Information Notice System; and Global Data Source.

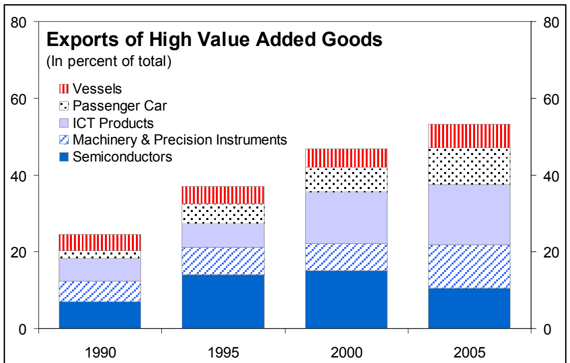


Source: CEIC Data Company, Ltd.

[1] Prepared by Varapat Chensavasdijai.

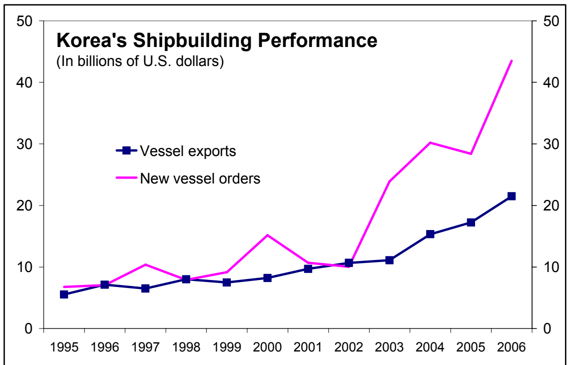
in manufacturing, averaging 10 percent during 2002–06, mainly driven by technological innovation and labor-shedding as part of corporate restructuring efforts.

3. **Korea has maintained its export growth by specializing in higher value-added products, while remaining relatively diversified.** Over the past fifteen years, there has been a clear shift in the production of low value-added goods to high value-added goods, as well as a marked improvement in the quality of Korean products. This can be largely attributed to the high level of R&D investment in product development and design. Indeed, Korea's R&D spending as a share of GDP is among the highest in the OECD, at close to 3 percent of GDP. High value-added products such as automobiles, consumer electronics, and ships now make up more than one-half of Korea's exports, up from just one-fourth in 1990, at the expense of light industry products such as textiles. Korea is currently home to the world's three largest shipbuilding companies, third largest steel producer, sixth largest carmaker, and leading producers of memory chips (including the biggest maker of NAND flash and the top two makers of DRAM chips), mobile handsets, and LCDs. The Herfindahl index, which measures the degree of trade specialization, increased from 0.03 in 1990 to 0.05 in 2005, suggesting that Korea has become more specialized over this period.[2] While the low values of the Herfindahl indices for Korea, Japan, and China indicate that exports of these countries are relatively diversified, Korea turns out to be the least diversified of the three.



Source: CEIC Data Company, Ltd.

4. **A good example of Korea's export success is its shipbuilding industry which has become a dominant global player over the past few years.** Exports of vessels have increased by 25 percent per year on average since 2004, and now account for 7 percent of Korea's total exports. Korea overtook Japan as the world's largest shipbuilding nation in 2000. By 2006, Korea's share in the global shipbuilding market was 40 percent in terms of new orders, followed by China and Japan at around 25 percent each. Korea has gained a competitive edge in shipbuilding

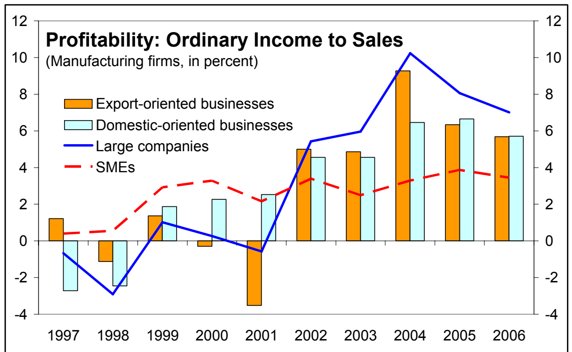


Sources: CEIC Data Company, Ltd. And Korea Shipbuilders' Association.

[2] The Herfindahl index is derived from the sum of squares of the share of a commodity in a country's total exports, across all industry subgroups. The index ranges from 0 to 1 and a higher value indicates that the country is more specialized in the production of a few goods.

through its high productivity, strong infrastructure and labor skills, advanced technology, and improved design and construction capabilities. Major shipbuilding exports include large tankers, liquefied natural gas (LNG) carriers, and mega-container ships. Korea's shipbuilders are benefiting greatly from the surge in global trade, oil prices and energy demand, as well as strong demand for offshore oil facilities, machinery, and construction equipment.

5. **The strong won appreciation is, however, having an impact on corporate profits.** Profits at large companies—many of which are export-oriented—have remained at healthy, albeit reduced levels, as foreign exchange hedging and the shift of operations overseas as well as other cost-cutting measures have helped them mitigate the impact of the currency appreciation. However, Korean SMEs are coping with difficulty, partly due to increased competitive pressures from China and other low-wage countries and slow progress on some structural reforms. Some large Korean companies have pressured local SME suppliers to reduce prices, while other have switched to lower-cost foreign suppliers altogether. In response to heightened competition, some SMEs have either gone out of business or relocated all or part of their production facilities overseas. As a result, investment in the manufacturing sector has been modest and manufacturing employment has declined. In addition, SMEs have not been able to benefit fully from the country's rapid technological advancement as R&D activities have been concentrated in a few large enterprises and in the manufacturing sector, notably in information and communication technology (ICT) and automobiles.[3] Thus SMEs faced difficulties in upgrading their products and technologies to remain competitive. This is worrying because SMEs—which account for about one-half of manufacturing output, one-third of exports, and 90 percent of total employment—are an important source of jobs and spending for the economy.

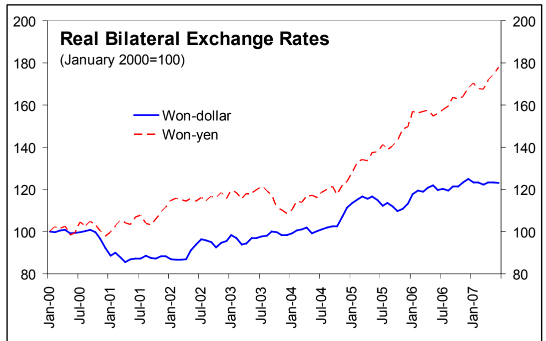


Source: BOK Financial Statement Analysis.

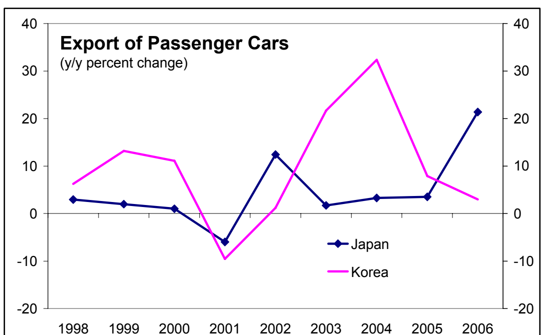
6. **In particular, the strengthening of the won vis-à-vis the Japanese yen is hurting Korea's competitiveness in some sectors.** The won has appreciated by 60 percent in real terms against the yen since end-2003, reaching a ten-year high recently. Partly as a result, Korea's trade deficit with Japan has continued to widen, reflecting the won's higher purchasing power as well as Korea's strong dependence upon Japan for imports of high-tech capital goods as well as parts and materials for its manufactured products. Japan is Korea's

[3] According to the OECD (2005), the ICT and automobile sectors accounted for 60 percent of business R&D expenditures in Korea in 2003, with the top five companies in these two industries accounting for 37 percent of total business R&D. In contrast, the service sector only made up 13 percent of business R&D.

closest competitor in major export industries, including electronics and automobiles.[4] Various measures of export competition in third markets, including the export similarity index and the index of trade competition, suggest that the degree of competition between Korea and Japan is the most intense and has increased significantly during the past two decades.[5] Thus the won appreciation relative to the yen is squeezing profit margins of some Korean companies, notably automakers. For example, Korea's export growth of passenger cars in unit terms decelerated sharply between 2004 and 2006, while that of Japan surged over the same period. The share of Japanese automobiles in the U.S. market rose from 29 percent in 2003 to 37 percent in 2007, while the share of Korean cars increased only slightly from 4 percent to 5 percent. Consequently, Korean automakers have recorded a fall in profit margin from 7 percent to 4½ percent since 2003, while profit margins at Japanese car companies have remained stable at about 5 percent.[6]



Sources: IMF, Information Notice System; and CEIC Data Company, Ltd.



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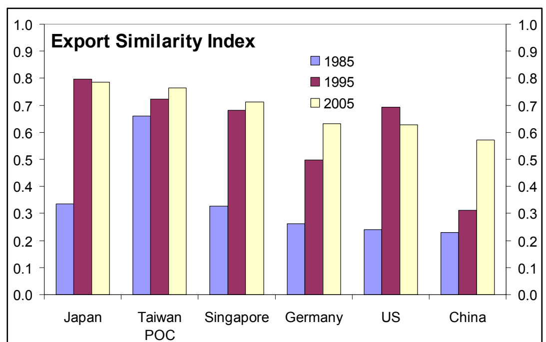

Source: Staff calculations.

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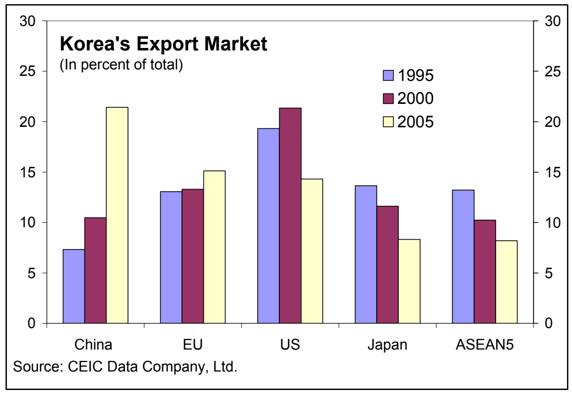
[4] Kang (2007) finds that the gap between the levels of sophistication of manufacturing exports for Korea and Japan has remained relatively unchanged (with the ratio of Korea-Japan export prices below one) since the mid-1990s, which means that Korea still lags Japan in the level of technological progress.

[5] The export similarity index measures the extent to which two countries compete by exporting the same products in world markets and is derived from the cosine of the vectors of the shares of each commodity in total exports for Korea against its trading partner, calculated using Standard International Trade Classification (SITC) 3-digit trade data. The index ranges from 0 to 1 and a higher value denotes that the composition of exports between the countries is more similar. The index of trade competition, another variant of the export similarity index, between Korea and Japan rose from 0.42 in 1985 to 0.64 in 2005, while that between Korea and China increased from 0.41 to 0.48 during the same period. See Cerra and others (2005) for details of the index.

[6] Profitability is measured by the ratio of ordinary income to sales for Korea (Financial Statement Analysis, Bank of Korea) and the ratio of operating profits to sales for Japan (Business Accounts of Corporations, Ministry of Public Management, Home Affairs, Posts and Telecommunications).

C. China: Trading Partner or Competitor?[7]

7. **China has been a key factor driving Korea's export growth during the past decade.** Korea's exports to and bilateral trade with China have increased by sixfold in value since 1998, reaching $70 billion and $120 billion in 2006, respectively. Through its booming economy and emergence as a regional production hub, China has become the most important destination for Korean exports, surpassing the United States in 2003 and accounting for one-fifth of total goods exports. Korea has its highest bilateral trade surplus with China, on the order of $20 billion on average during the past four years, exceeding even the surplus with the EU as a whole. At the same time, Korea's imports from China are rising, particularly in intermediate goods and, as a result, Korea's trade surplus with China began to narrow in 2006.



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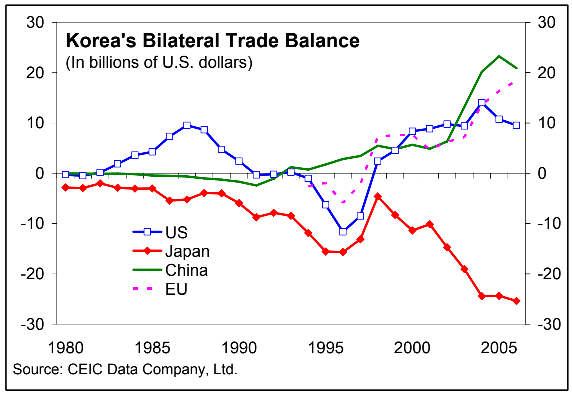
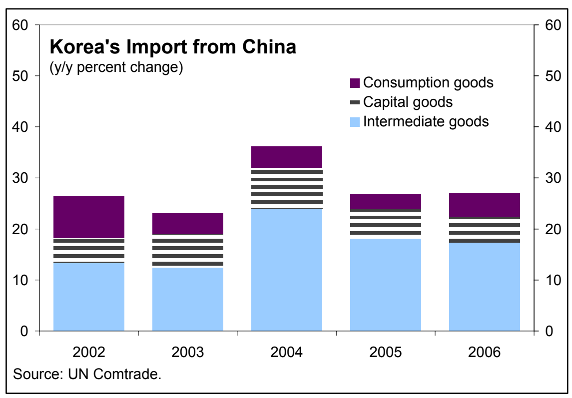


Source: CEIC Data Company, Ltd.

8. **Korea's trade with China has been driven by the expansion of production networks and the rapid growth of processing trade.** The fragmentation of production processes, prompted by low input costs and high labor productivity in China, has led to the development of production networks in Asia. This is reflected in the rise in China's role in Korea's trade in parts and components since the early 1990s. According to Kim and others (2006), China's share in Korea's total parts exports increased sharply from 1 percent in 1992 to 27 percent in 2004, notably in the electronics sector, replacing the United States as the major export market for parts.[8] The share of China in



Source: UN Comtrade.

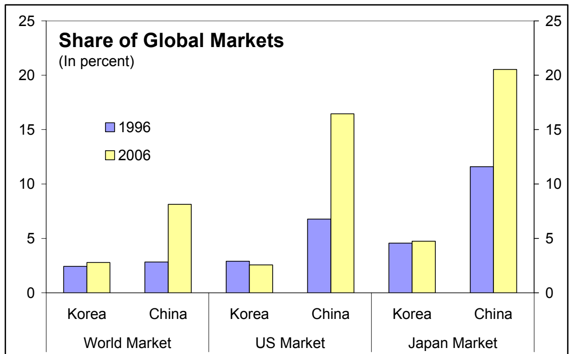
[7] The author is grateful to Murtaza Syed and Masahiro Hori for providing data for the analysis in this section.

[8] Estimates of the share of parts and components in Korea's total exports to China range from 50 percent (Kim and Park, 2006) to 70 percent (Ahmed and others, 2007). In China's manufacturing sector, parts and

(continued)

Korea's total parts imports also rose significantly from ½ percent to 12 percent, with Korea importing less from Japan and the United States. Similarly, Korea's share of parts imports by China grew from 2 percent to 12 percent over the same period. These highlight the role of China as a major assembler of parts and components into final goods as well as the strengthening of production linkages between China and Korea. Kim and Park (2006) note that on the whole China has thus far had a positive impact on Korean exports, due to the surge in China's processing trade and Korea's direct investment in China, both of which increased the demand for parts and materials from Korea.

9. **But China is also posing challenges for Korea.** On the domestic front, Korean firms are facing stiffer competition at home from the sustained rapid growth of low-price Chinese imports, for both raw materials and consumer goods. At the same time, China has also become a key competitor in the global markets, by catching up with other countries in terms of product technology, while offering lower prices for its goods. Over the last decade, China's rapid export expansion has displaced Korea's exports in major markets, notably in the United States and Japan. Korea's share in the U.S. market dropped slightly from 3 percent in 1996 to 2½ percent in 2006, while China's share rose from 7 percent to 16 percent over the same period. Similarly, Korea's market share in Japan remained at around 4½ percent during this period, although China's share doubled to 21 percent. Kim and others (2006) find that China's displacement of Korean exports in Japan and the United States between 1992 and 2004 occurred mostly in the low-tech and medium-low tech industries.[9] Nevertheless, Korea has been able to raise its market share in the high-tech and medium-high tech industries in the world's major markets, even as China was also increasing its own market shares in these industries. This more than offset the loss of Korea's export market share to China in the low-tech and medium-low tech sectors in world markets.



Sources: CEIC Data Company Ltd. and IMF WEO database.

10. **China is quickly moving up the value chain in many sectors.** China's export structure more closely resembles that of Korea today than it did a decade ago, with electronics comprising nearly 40 percent of total exports. Over the last decade, the share of China's IT exports in the world market has risen by more than fivefold. While a majority of

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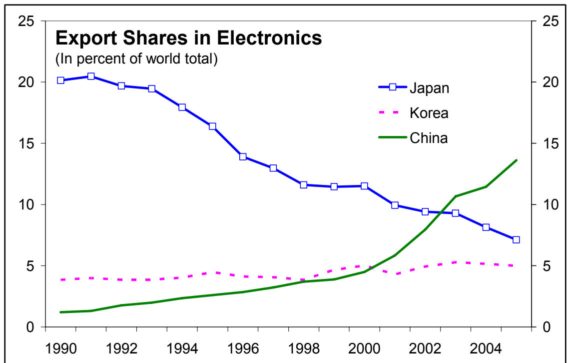
components account for 30 percent of total exports and 40 percent of total imports in 2005 (Ahmed and others, 2007).

[9] Kim and others (2006) follow the OECD classification of technology groups (low, medium-low, medium-high, and high) based on the International Standard Industrial Classification (ISIC).

high-tech products are still manufactured by foreign companies operating in China and the most sophisticated parts and components continue to be imported, China has made considerable effort in moving up the product ladder.[10] This has been aided by the strengthening of R&D by major multinationals in China's IT sector, especially consumer electronics. In a study by Samsung Economic Research Institute (2007), the number of overlapping exports among the top 100 items of Korea and China rose from 21 in 1995 to 29 in 2005, with half of these belonging in the medium-tech category and the rest in the high-tech category. In addition, the export similarity index indicates that China is beginning to compete with Korea in similar export products, particularly during the past decade.[11] Kang (2007) also shows that while Korea's manufacturing exports remain more sophisticated than those of China's, the gap between the levels of sophistication (proxied by relative export prices) of the two countries has narrowed sharply since 2001.[12] Moreover, Kim (2007) reports that China has already surpassed Korea in industrial competitiveness (based on price, quality, production, organization, and labor skills) in clothing and MP3 players, and is catching up rapidly in telecom equipment, digital TVs, and steel. However, Korea remains far ahead of China in the areas of auto parts, shipbuilding and petrochemicals.



Source: World Bank and UNCTAD, World Integrated Trade Solution.

11. **The shipbuilding industry in China is emerging rapidly.** According to Lim (2007), Chinese shipbuilders have now reached the world's top position in terms of new orders, which have accelerated in the past two years, with the strong support of the government. China has 31 shipbuilding companies among the world's top 100, compared with Japan's 30 and Korea's 15. Nevertheless, Korea is still ahead of China in key areas such as the production of high value-added ships. More than one-half of new orders at Chinese shipyards in 2007 were for low value-added bulk carriers, whereas orders placed in Korea were mostly for high-end LNG carriers and container ships. China also trails behind Korea when it comes to the level of productivity, technology, and domestic content of ships. For example, China

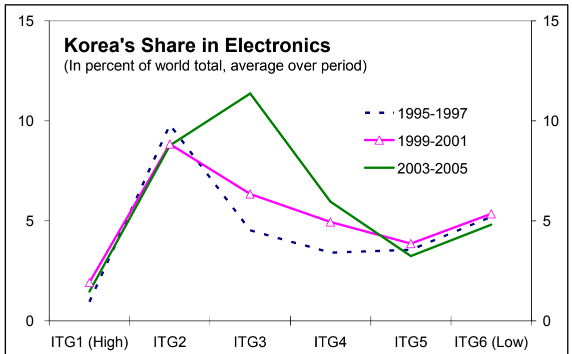
[10] SERI (2007) finds that foreign firms contributed around 80 percent of China's high-tech exports in 2005. Kim and Park (2006) also note that in 2005, 13 of the 100 largest exporters in China were Korean, constituting 9 percent of total exports. Fifty-nine enterprises were foreign, accounting for 55 percent of total exports.

[11] Schott's (2007) version of the export similarity index indicates that China's manufacturing exports have become more similar with those of the OECD as a whole, although prices of Chinese exports remain below those in the OECD, which suggests that they are of lower quality.

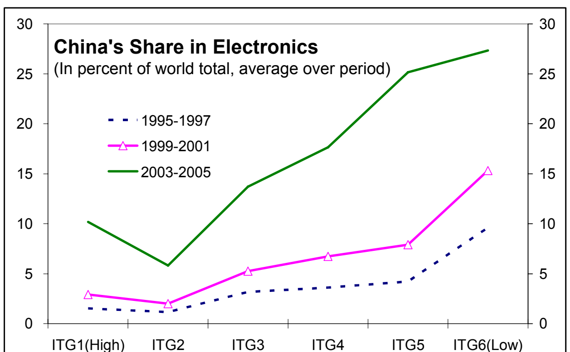
[12] Using a weighted index of per capita GDP associated with a country's exports to measure the level of sophistication, Rodrik (2006) also reaches a similar conclusion.

produces only 40 percent of required inputs for its ships domestically, compared with Korea's domestic content of 90 percent.

12. **China's level of export sophistication in the IT sector has increased markedly, but mainly at the lower end.**[13] While the expansion of IT exports over the past decade is evident across the entire technology spectrum, most of the increase has been concentrated at the lower end. Japan has lost market share across all groups, presumably to China and other low-cost countries where production has been outsourced. At the same time, Korea has managed to move up the value chain by raising its share of medium- to high-end IT products in world markets, although not at the highest end. As mentioned above, one plausible reason could be that Korean companies in China are producing and exporting these types of products, which along with other foreign companies has helped to lift China's export share at the higher end groups. These observations are consistent with the "flying geese" model, where innovation and the transfer of technology through production networks enable developing economies to catch up with more advanced ones.[14]



Source: Staff calculations.



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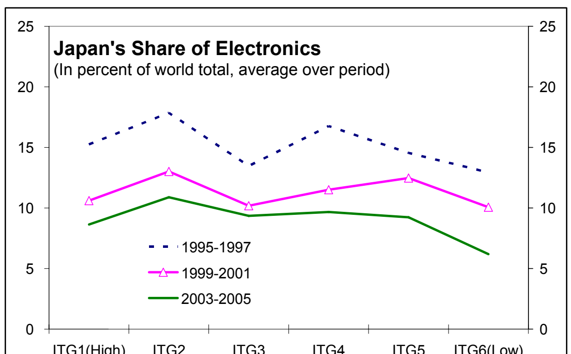
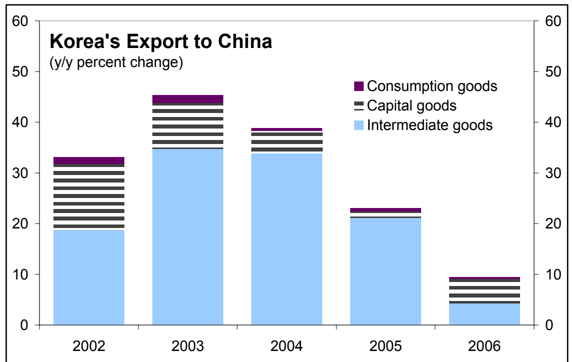


Source: Staff calculations.

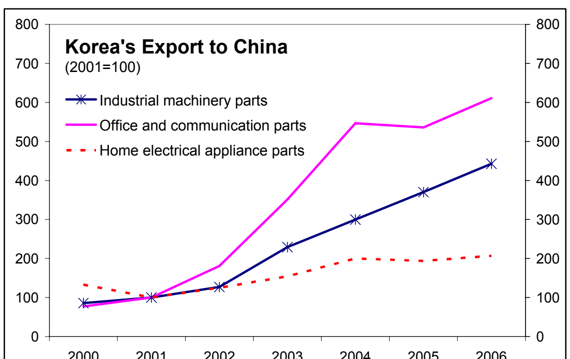
[13] Using SITC 5-digit trade data, the definition of IT products comprises a total of 129 goods within categories 75, 76, 771, 772, 773, and 776. The ordering of each product by level of technology is based on the weighted average of per capita GDP of the countries that export this product, where the weights are determined by the country's share of world exports of the product.

[14] See Hiratsuka (2005) for an application of the flying geese model in manufacturing in East Asia, with Japan identified as a frontrunner in the product cycle, followed by the NIEs (Hong Kong SAR, Korea, Singapore, and Taiwan Province of China), and finally China and four ASEAN countries (Indonesia, Malaysia, Philippines, and Thailand).

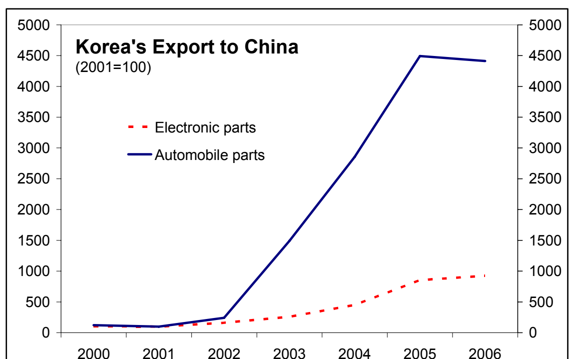
13. **China has also become more self-reliant, importing less from Korea.** Korea's export growth to China has dropped dramatically since 2003. The slowdown in exports to China has been particularly severe for intermediate goods, and to a lesser extent for capital goods, reflecting China's increasing production capacity and ability to produce these goods domestically.[15] Within intermediate goods, the slowdown has been mainly in the low-tech categories such as home electrical appliances and office and communication, while exports of automobile parts have held up well. In terms of sectors, Korea's exports of electronics to China have taken the biggest hit in the last few years, while exports of electrical machinery and manufactured goods (mostly iron and steel) have become stagnant more recently. But this is not a phenomenon unique to Korea. Indeed, China's total import growth has slowed in recent years, with the largest contribution to the slowdown coming from intermediate goods. These observations are not surprising, given that China has invested heavily in the production of steel and chemicals and has also benefited from substantial inflows of foreign direct investment in the electronics sector, both of which have enabled it produce domestically most of its raw materials as well as some intermediate goods in the more advanced sectors.[16]



Source: UN Comtrade.



Sources: UN Comtrade, CEIC and staff estimates.

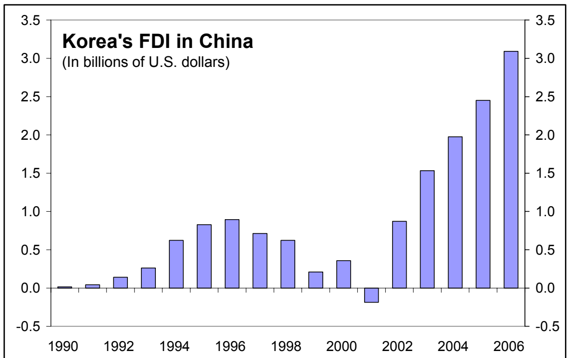


Sources: UN Comtrade, CEIC and staff estimates.

[15] Cui and Syed (2007), find that the domestic content of China's exports has increased. This is supported by the observation that the domestic production capacity of a number of raw materials has risen sharply, while exports of final goods have grown faster than their associated imported components, especially for low-tech products.

[16] Cui and Syed (2007) assess that while the sophistication levels of China's electronics exports and imports have increased over time, imports continue to have higher levels of sophistication than exports and the gap between the two remains significant. This suggests that China still relies on imports of high-tech intermediate inputs for the production of its more sophisticated final goods.

14. **Korea's substantial investment in China had initially boosted its exports.** Korean companies have been establishing a manufacturing base in China, to take advantage of its low production costs and to gain access to the rapidly expanding domestic consumer market, supported by China's openness to foreign investment.[17] Korea's direct investment in China has increased rapidly over the past several years, with FDI amounting to $10 billion during 2002–06. Since 2002, China has replaced the United States as Korea's largest destination for overseas investment, accounting for 45 percent of Korea's total outward FDI on average, more than twice the share in the 1990s. The setting up of Korean overseas affiliates, including through joint ventures with domestic Chinese firms, and the ensuing flows of FDI to China have fostered the transfer of technology and created a platform for the production of goods, mostly in the manufacturing sector.[18] These goods are sold domestically, exported back to Korea (i.e., reverse imports), or exported to third markets, the last of these bypassing some of Korea's direct trade with these countries. The initial stage of the investment cycle involved significant intra-firm trade, whereby parent firms supplied parts and components to their overseas affiliates for final assembly. This led to an increase in Korea's exports of intermediate goods to China.



Source: Ministry of Commerce, Industry and Energy.

15. **But China's improved production capabilities may be contributing to Korea's recent export slowdown.** As Chinese firms have become more technologically advanced and domestic supply chains have been developed, Korea's overseas affiliates in China have been able to partially substitute domestically produced intermediate inputs for similar imports from Korea.[19] A survey of affiliates of Korean manufacturing companies in China,

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[17] Kim and others (2006) note that according to a survey of 706 Korean manufacturing companies conducted in 2003 by Korea Institute for Industrial Economics and Trade (KIET) and Ministry of Commerce, Industry and Energy (MOCIE), 43 percent of firms cited low labor costs as the primary factor for investing in China, while 33 percent pointed to market access.

[18] Data from the Export-Import Bank of Korea indicates that 80 percent of Korea's FDI in China takes place in the manufacturing sector, with the rest in services and construction. Within manufacturing, the electronics and telecom equipment industries account for the biggest share of the total stock of Korea's FDI in China at 27 percent, followed by transport equipment (13 percent), petroleum and chemicals (11 percent), and textiles and apparel (11 percent). Kim and Mah (2006) also point out that there has been a shift in Korea's FDI from consumption goods (such as textiles, leather and footwear) to capital goods in China's manufacturing sector since the 1990s.

[19] Indeed, Chinese firms have also been able to increase their parts exports as a share of total exports from 13 percent in 2000 to 17 percent in 2005 (Samsung Economic Research Institute, 2007).

covering both large firms and SMEs, conducted jointly by Korea Institute for Industrial Economics and Trade and Ministry of Commerce, Industry and Energy, indicated that the share of local procurement of parts and components rose from 27 percent in 1996 to 46 percent in 2003, while the share of parts and components imported from Korea in total procurement fell from 65 percent to 37 percent, notably in electronics and telecom equipment where Korea's FDI in China has been concentrated.[20] The survey also revealed that the share of domestic sales in total sales of overseas affiliates increased from 23 percent in 1996 to 34 percent in 2003, signaling the rise in the spending power of China's emerging middle class, which represents a substantial opportunity for Korean exporters.[21] Meanwhile, the share of reverse imports dropped from 26 percent to 18 percent, which seems to suggest that Korean firms have increasingly moved the final assembly stages of production to China, rather than sending goods back to Korea for the "finishing touches". Finally, although on the whole the share of manufacturing exports to third markets by Korean firms in China remained unchanged at around 50 percent, exports of machinery and equipment and electronics and telecom equipment to third markets increased substantially, an indication that the rise of China as a major production and export platform has indirectly contributed to the growth of Korea's high value-added industries.

D. Policy Implications

16. **Looking ahead, Korea will face a number of challenges to its external competitiveness.** Korea has been successful in moving rapidly up the value-added chain and staying ahead of the competition in many key export sectors, spurred by its high productivity in manufacturing, intensive investment in R&D and education, and its role as a major supplier of intermediate goods in the regional production network. But a declining labor force, low service sector productivity, and increasing competition from low-cost countries are putting pressure on Korea's competitive position. The government recognizes these challenges and has taken some steps to address them. Nevertheless, more needs to be done to ensure that Korea maintains its competitiveness in the global marketplace.

17. **To remain competitive, Korea should continue to move its manufacturing sector up the value chain.** To achieve this, following OECD (2005) recommendations, the R&D

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[20] According to Kim and others (2006) in the electronics and telecom equipment sector, the share of local procurement by Korean affiliates increased from 14 percent in 1996 to 57 percent in 2003, while imports from Korea fell from 86 percent to 36 percent. It is not possible to ascertain from the survey whether Korean firms operating in China are procuring locally from other Korean affiliates, in which case earnings remain within the corporate group and may be repatriated back to Korea, or from Chinese firms, some of which could also still be importing intermediate goods from Korea.

[21] The share of domestic sales in total sales may be biased upward since the firms surveyed also include Korean suppliers selling intermediate goods to other Korean affiliates in China and do not represent exclusively the Chinese local market.

framework could be improved to promote private sector R&D and greater diffusion of technology, especially to the lagging sectors of the economy. Specific policies include maintaining flexibility in setting priorities for R&D spending and avoiding concentration of R&D in a few targeted sectors; strengthening R&D linkages among businesses, universities, and the government; upgrading the R&D role of universities; promoting international technological collaboration, in part through FDI; and improving the quality of human capital, including by restructuring the education system, especially at the tertiary level.

18. **A more conducive business environment would help attract foreign investment.** FDI inflows to Korea have been low compared to those of other OECD countries, totaling just $34 billion (1 percent of GDP on average) over the period 2000–05. Moreover, the share of the service sector in the stock of inward FDI is the lowest in the OECD at 27 percent (OECD, 2007). Korea ranks 14th among OECD countries in terms of inward FDI potential, but ranks 24th in terms of FDI performance, which compares actual inflows relative to economic size. Creating better business conditions, including through a less complex and more transparent regulatory framework and a more flexible labor market, would help encourage domestic and foreign investment, which would not only increase innovation through greater competition and the transfer of technology and management skills, but also generate more and better jobs.

19. **Korea also needs to raise its services productivity.** The Korean economy is shifting further from manufacturing toward services, and this trend is expected to continue as has been witnessed in other advanced countries. Boosting productivity in the service sector is therefore essential to ensure a smooth transition and sustain growth. Key steps include opening and deregulating the service sector, improving access to market financing for small and knowledge-based enterprises, and easing the burden imposed on those using bankruptcy laws. The government is taking a piecemeal approach by targeting specific sectors, such as the elimination of the value-added tax for hotels and the provision of tax and other financial incentives to promote the development of golf and maritime leisure facilities. These measures could introduce market distortions and erode the tax base. More comprehensive reforms to relax product market regulations and open the service sector—including in the knowledge-based industries such as legal and accounting services—to competition would be a better policy option. In addition, the government is pursuing free trade agreements as an impetus to deregulate the service sector, including with the United States and the European Union. However, the recently signed FTA between Korea and the United States excludes the education and health sectors, where competition is still limited and where strong demand for healthcare services is envisaged given Korea's rapid population aging.

20. **Efforts to enhance labor market flexibility and upgrade the safety net should be strengthened.** Policies should be aimed at reducing employment protection of regular workers while expanding and strengthening the social safety net. A new labor law, intended to provide job security for nonregular workers, recently came into force. Effectively, workers who have been employed by a firm for more than two years will be granted the status of

regular workers. However, this raises the cost of hiring nonregular workers, who are likely to face higher job turnover as firms allow their contracts to expire, and provides less incentive for firms to invest in the upgrading of skills. While this law will help reduce the duality in the labor market, it needs to be complemented with measures to increase employment flexibility for regular workers. In this regard, dismissal conditions for regular workers have been eased, for example through shorter consultation periods, but severance costs remain high. Most workers are eligible for unemployment benefits, but actual coverage remains low due to weak compliance.

E. Conclusion

21. **Korea has been able to maintain its competitive edge in the global economy and stands to benefit from further structural reforms.** The exchange rate has appreciated steadily in recent years, but overall export performance has remained strong. At the same time, Korea is facing increasing competition from Japan and China and other low-cost countries, while a shrinking labor force and stagnant service sector productivity threaten to limit its potential growth. To cope with these challenges and achieve sustainable growth over the long term, Korea will need to continue to bolster its competitiveness by moving its manufacturing sector further up the value chain and accelerating reforms aimed at improving the investment climate, opening and deregulating the service sector, and enhancing labor market flexibility.

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III. INTERNATIONALIZATION OF THE WON[1]

1. **Korea has launched an ambitious program to deepen the development of its financial system and transform Seoul into a financial center.** Under the financial hub initiative launched in 2005, the Korean authorities aim at transforming Seoul into Northeast Asia's financial center. To do so, the authorities are deregulating the capital markets by easing barriers between different financial activities outside of banking and insurance and fully liberalizing the capital account. As remaining restrictions on the capital account are eliminated, the authorities intend to promote a greater international use of the won.

2. **This note argues that the international role of the won can be expected to increase as Korea's financial sector develops and cross-border transactions expand, but internationalization of the won should not precede financial development.** It presents some key requirements that would need to be met to see the won being increasingly used internationally, and some possible implications for Korea. The analysis relies on the literature on international currencies and past experiences of internationalization, including that of the yen in the 1980s.

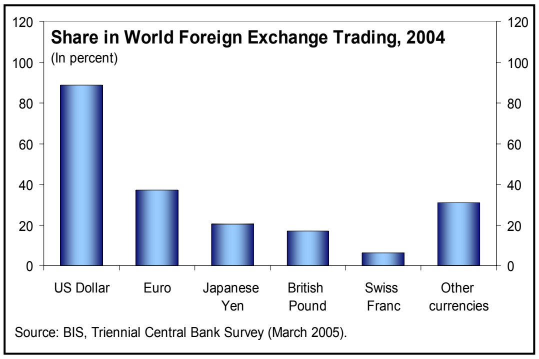
A. What is Internationalization of a Currency?

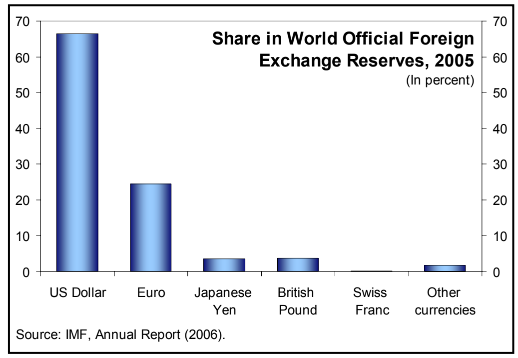
3. **An internationalized currency is one which performs the functions of a medium of exchange, unit of account, and store of value beyond the borders of the nation that issues it.** As a medium of exchange, an international currency helps the settlement of international trading transactions. As a unit of exchange, it is used for invoicing trading transactions and denominating financial instruments. As a store of value, it is used as an investment asset by nonresidents. This is not to be confused with the narrow concept of allowing the offshore use of a currency

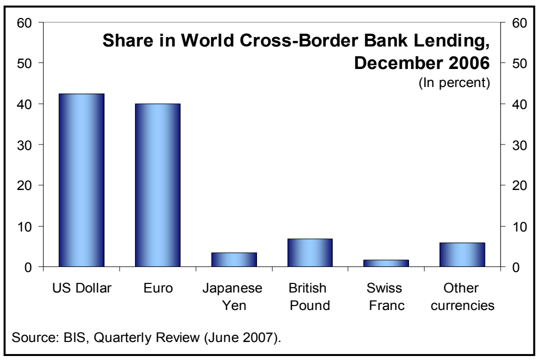
4. **Recent data show that only very few currencies qualify as international currencies.** A close look at recent data on foreign exchange trading, official reserves composition, cross-border bank lending and international bond issuance shows that the dollar remains the key currency of choice in the international financial system. The dollar is also predominantly used as the currency of choice in invoicing of international trade, especially for commodities. At the same time, since its birth in 1999, the euro has acquired a sizable international dimension and its role is gradually rising. Apart from these two currencies, the yen, the pound and the Swiss franc play some role, albeit relatively minor ones. The international use of the yen is to a large extent supported by the importance of Japan in the

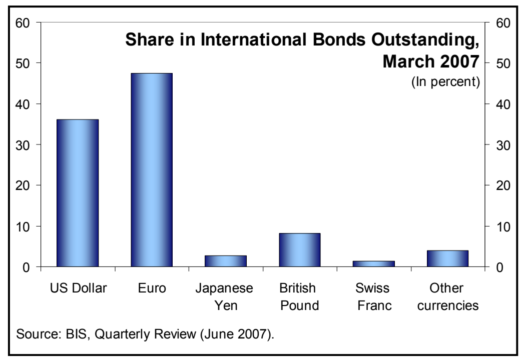
[1] Prepared by Romuald Semblat.

world economy while the pound is backed by a major international financial center. The Swiss franc benefits from its role as a safe haven currency.









B. Could Internationalizing the Won Help Seoul Become a Financial Hub?

5. **Under the Financial Hub Initiative, Korea has ambitions to develop Seoul as a financial center.** To achieve this objective, the authorities are planning to develop capital markets. Already, the Capital Market Consolidation Act, which aims at easing barriers between different capital market activities, such as securities business, asset management and derivatives transactions, has been passed. This should help promote the consolidation of securities firms and foster the development of strong and well-capitalized investment banks. The authorities have also taken several steps to develop the bond and money markets.[2] In addition, the authorities aim at eliminating remaining restrictions on the capital account, so as to promote cross-border transactions, and allowing a greater international use of the won.

6. **Having a developed financial center helps a national currency be used globally and vice versa.** As was observed by Williams (1968), the international role of the pound until 1914 was largely due to the predominance of London as an international banking center. This was also the case for the U.S. dollar after World War II, and New York's role as an

[2] See Semblat (2006).

international banking and financial center.[3] At the same time, having an international currency can contribute to the development of a financial center. As the international use of a currency increases, financial transactions relying on the banking and financial institutions of the country expand, especially as those institutions have a comparative advantage in dealing in the currency in question. Eventually, this process can lead to the emergence of a financial center.

7. **However, a currency can become internationalized without relying on an international financial center.** This has been the case for the euro. Both Frankfurt and Paris have large financial markets, but they have not developed as international financial centers and a large share of cross-border financial transactions in euro is done in London.[4] Perhaps, this is due to the predominance of London. Thanks to the "Big Bang" of the late 1980s and its large, open and deep financial markets, London has cemented its place as the preeminent center for financial intermediation in Europe. London captures a sizable share of financial transactions in euro, especially in foreign exchange trading transactions, and Paris and Frankfurt remain far behind. This could also be due to the specificities of the French and German financial systems: France and Germany have developed around bank-centered financial systems, with a smaller role for capital markets in financial intermediation. The continuing existence of a large public sector and cooperative (mutual) component in their banking system may have also delayed the development of market mechanisms and the internationalization of their financial systems.

Foreign Exchange Market Turnover
(As a share of total transactions)

	1992	1995	1998	2001	2004
London	27.0	29.5	32.5	31.2	31.3
Paris	3.1	3.7	3.7	3.0	2.6
Frankfurt	5.1	4.8	4.8	5.5	4.9

Source: BIS Triennial Central Bank Survey (2005).

8. **An international financial center can emerge without the benefit of an international currency.** Singapore is such a case. Despite having established itself as an international financial center, the authorities have since the early 1980s deliberately pursued a policy of noninternationalization of the Singapore dollar.[5] This was possible as the restrictions in place were limited to selected asset-side banking transactions such as cross-border lending for speculative activities or for residents for use outside Singapore while no restrictions were imposed on the liability side or on bona fide capital account transactions. At the same time, policies to strengthen the banking sector, raise the institutional environment to

[3] See Kenen (1988).

[4] See ECB (2005).

[5] See Lee (2001).

international best practices and develop capital markets have been successful. However, cognizant that some of the restrictions were hampering the deepening of financial markets, Singapore has recently started relaxing its noninternationalization policy.

C. What Would be the Merits and Demerits for Korea of Internationalizing the Won?

9. **There are several important benefits from having an international currency.** First, thanks to its use in invoicing and payments, an international currency allows the country's exporters, importers, borrowers and lenders to eliminate the exchange rate risk inherent to international trading and financial transactions. Of course, given the recent development of derivative products, this benefit may now be smaller than in the past. Second, it provides seignorage as a country can denominate its external liabilities in its own currency. Finally, it can foster the development of the country's banks and other financial institutions owing to their comparative advantage in dealing in their own currency. Given the high degree of openness of Korea to trade—total trade represents almost three-quarters of GDP—and financial flows, those benefits could be significant. However, with Korea exporting a large share of its exports to industrial countries which tend to denominate their imports in their own currencies and to Asia which relies on the U.S. dollar for invoicing, the potential for a shift to won of exports invoicing may not be very large.

10. **However, allowing a currency to internationalize could complicate the operation and design of monetary policy.** First, it can increase demand for the country's currency and affect the money supply. This was the reason why Germany and Japan persistently prevented the internationalization of their currencies.[6] As Frankel (1984) noted: "The Japanese monetary authorities were concerned that extensive foreign holdings of their currency would reduce their degree of control over the money supply and increase the variability of the exchange rate". For Germany, Tavlas (1996) argued that "Between the late 1960s and early 1980s, the Bundesbank attempted to limit the international use of the deutsche mark. Underlying this approach was the view that substantial swings in capital flows could interfere with domestic stabilization". As a result, the international role of the yen and the deutsche mark did not become commensurate with the size of the Japanese and German economies. Internationalization of a currency can also affect the design of monetary policy. Given the increased impact abroad of its monetary policy decisions, a central bank could be inclined to include in its monetary policy function an international element. As Frenkel, Goldstein and Masson (1989) noted, "the independent pursuit of monetary policy objectives, with benign neglect of the international repercussions of national policy decisions for large countries with international currencies is not an option because these countries can exercise appreciable influence over prices, especially the real exchange rate". This could make the conduct of monetary policy difficult, especially when domestic and international considerations clash.

[6] For the case of the deutsche mark, see Tavlas (1996). For the case of the yen, see Tavlas and Ozeki (1992).

While given Korea's relative size, this demerit is not expected to be large, the problems associated with the impact of won internationalization on monetary operations could be more significant. Complete capital account liberalization, by itself, creates challenges for monetary policy, especially when its objective is not fully consistent with exchange rate policy. Internationalizing the won, and in particular, allowing nonresidents greater use of the won for international financial transactions, could magnify these challenges.

D. What Are the Preconditions to Become an International Currency?

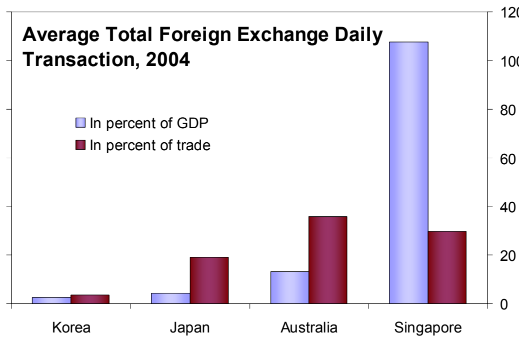
11. **First of all, size does matter.** The currency of a country that has a large share in international output, trade and finance has a natural advantage in becoming an international currency. This is because the larger the country's share of world exports, the greater the chance that its currency will be used to invoice and settle international trading transactions. Additionally, the more its exports comprise differentiated manufactured products, and the larger its share of products that are imported by developing countries, the larger its role in invoicing. This is also true for financial transactions.

12. **Second, to attain international currency status, capital and money markets in the country must be open, deep and well-developed.** Capital account transactions should be free of control, so as to keep cross-border transaction costs low and allow international financial transactions. Financial markets must be deep so as to provide sufficient liquidity for transactions and offer a wide range of financial assets for nonresidents. Finally, they must be well-developed with a very efficient intermediation process so as to provide the highest possible return at the lowest possible risk for the nonresident holders of financial assets.

13. **Finally, the confidence of foreigners in the maintenance of the currency value is critical for it to become an international currency.** This is of course, because, given its role as a global store of value, the long-term value of other countries' international reserves or financial investment will be conditional on the maintenance of the external value of the key currency. But more generally, economic agents prefer currencies with low inflation costs, in the form of relatively low inflation and low variability, for international trading and financial transactions. This, of course, depends on a track record of stable and predictable monetary and fiscal policies and more generally macroeconomic stability.

E. What is the Authorities' Plan for Internationalizing the Won?

14. **Given the increasing importance of Korea in the world economy, the authorities expect the won to play a bigger role in the international financial system.** The Korean economy has become one of the world's largest economies with Korea now a sizable



Source: BIS, Triennial Central Bank Survey (March 2005).

exporter with a number of Korean companies world leaders in some markets. Korean financial markets are growing and developing fast. The Korean banking market is the third largest in Asia, and its equity market and bond markets are among the largest. However, the won is not widely used outside of Korea and won transactions are relatively small for an economy with such size and high degree of openness. The authorities understand that the won is not going to supplant the dollar, but a more commensurate international use of the won should be achievable.

15. **Some of the foundations for an increased international role of the won are already in place.** The banking system has been restructured and stabilized. It is now highly profitable and includes a substantial foreign presence. At the same time, in order to remove impediments to the development of capital markets, the authorities have launched major initiatives with the twin objectives of easing barriers between financial activities and the complete liberalization of capital account transactions which should help to bring the offshore won trading onshore. The authorities are rightly pursuing the development and the deepening of the financial system before proceeding to internationalizing the won, and as conditions are in place, a market-driven increase in the international use of the won could occur. In addition, Korea's inflation performance has improved steadily and the monetary policy framework of the Bank of Korea helps bring predictability. Since the crisis and the adoption of the inflation targeting (IT) framework in 1998, inflation has come down. Headline inflation has averaged 3¼ percent with a standard deviation of around 2 percent while core inflation (until recently the target) was averaging 2¾ percent (standard deviation of 1½ percent). Some further improvement in the inflation performance could bring Korea in line with other advanced economies.

Selected Countries: Inflation Performance and Variability 1998-2006

	Average CPI inflation	Standard deviation CPI inflation
Korea	3.3	1.9
United States	2.3	0.7
Germany	1.4	0.6
Japan	-0.2	0.7

Source: CEIC Data Company, Ltd.

16. **Moreover, a plan for internationalizing the won is currently being implemented.** Since the early 2000s, the authorities have taken a series of measures to develop the foreign exchange market and remove remaining restrictions on the capital account: among others, the ceiling on won borrowing from nonresidents has been raised to won 10 billion; the limit on the net foreign open position for domestic banks has been increased to 50 percent of capital; a dollar/won futures contract has been listed on the Chicago Mercantile Exchange. Furthermore, the authorities have announced a roadmap to boost further the international role of the won. In the first phase of the plan covering 2006–07, the authorities plan to lower the withholding tax rates for nonresidents on won bonds, consolidate the won accounts of similar nature held by nonresidents, and remove limits on exports/imports of the won.[7] This should help foster the overseas use of the won. In the second phase of the plan covering 2008–09, the authorities intend to expand the scope of won transactions exempt from reporting requirements.

Selected Measures of Medium and Long-Term Forex Liberalization Plan

	Phase 1: 2006-07	Phase 2: 2008-09
Internationalization of the won	Expand won holdings by non-residents Pursue listing of won-dollar futures Lower withholding tax for non-residents on won bond income Consolidate won accounts for non-residents Remove Limits on export/import of the won	Expand scope of won transactions exempted from reporting
Abolishment of mandatory collection of external credit	Convert current approval regime to reporting system	Repeal the mandatory collection
Permission of foreign exchange business	Expand scope of foreign exchange business for NBFI	Allow all kind of won-denominate financial businesses
Development of foreign exchange market	Extend the limit on net foreign open position Allow margin trading in foreign currency	Remove foreign exchange position

Source: Ministry of Finance and Economy of Korea.

F. What Could Seoul Learn from the Experience of the Internationalization of the Japanese Yen?

17. **The issue of internationalization of the yen was triggered by the increased role of Japan in the world economy in the early 1980s.** It was strongly pushed by the United States as a way to redress trade imbalances that existed at that time between the United States and Japan with the objective of appreciating the yen to address these. A U.S.-Japan Yen-

[7] Until recently, Korea imposed three types of won-denominated accounts for nonresidents: free won accounts for proceeds from current account transactions, nonresident domestic currency accounts for proceeds earned in won in Korea and nonresidents accounts for securities and bonds.

Dollar Committee was set up in 1984 and measures to internationalize the yen and liberalize capital flows were agreed upon and initiated the same year.[8]

18. **Several measures were taken to foster the international use of the yen.** While some financial liberalization measures had been taken in the domestic financial market from the late 1970s, cross-border transactions remained tightly controlled. The report of the Yen-Dollar Committee sparked a number of measures to liberalize international yen transactions. At the same time, the authorities proceeded with the liberalization of domestic markets, notably through widening the range of domestic assets with market rates, relaxing the segmentation of domestic markets, expanding the scope of foreign participation in Japan's financial markets and strengthening bank supervision. Along with these measures, the Japanese authorities promoted the establishment of an offshore banking market. Such offshore banking market was designed to make Tokyo an international financial center for yen transactions. Through this market, opened in December 1986, banks were able to accept yen deposits from nonresidents and conduct offshore transactions without applying restrictions and regulations that were imposed domestically, such as reserve requirements.

Liberalization Measures on International Yen Transactions 1984-89

Dec-84	Nonresidents' eligibility to issue Euro-yen bonds was extended to include foreign private corporations with at least A rating
Apr-85	Nonresidents' eligibility to issue Euro-yen bonds was further extended by doing away with regards to their financial position
Apr-85	Withhodling tax on non-residents' interest earning on Euro-yen bonds issued by Japanese residents was abolished
Jun-85	Foreign banks were given access to the Euro-yen bond market
Nov-87	Nonresidents were allowed to issue Euro-yen commercial paper
May-89	Restrictions on Euro-yen lending to residents were relaxed

Source: Tavlas and Ozeki (1992)

19. **The policy of internationalization of the yen has achieved mixed results.** After some increase in the 1980s, the international use of the yen has declined: its use as an international reserve currency, in foreign exchange trading and international bond issuance is now lower than it was in 1990. Perhaps, this owes to an inadequate policy. The authorities had decided to opt for a two-track strategy: liberalizing the international use of the yen, while keeping the domestic yen market relatively controlled and regulated and minimizing the impact of the offshore liberalization on the domestic market. This two-track approach prevented the deepening of domestic financial markets and inflows into the Japanese financial markets. Moreover, as Japanese financial institutions faced difficulties in the 1990s, they retreated from overseas markets and the offshore yen market, most notably in Tokyo, contracted.[9] As the same time, capital markets remained unevenly developed and heavily

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[8] See Jeffrey Frankel (1984).

[9] As is shown in Tavlas and Ozeki (1992), another issue for the yen is the low level of invoicing of Japanese exports and imports in yen. This is largely the case because a large share of exports go to industrial countries which tend to denominate their imports in their own currencies and to Asia which relies on the U.S. dollar for

(continued)

regulated. Finally, the overwhelming presence of the public financial system, especially the Postal Savings system may have delayed the development of market-based mechanisms, especially in the government bond market.[10]

International Use of the Yen: Recent Evolution of Some Selected Indicators

	1980	1990	2000	2005
	Share in world total (in percent)			
Holding of International Reserves	4.5	9.1	6.1	3.6
Foreign Exchange Trading	...	13.6	11.4	10.2
Cross-border Lending	1.8	11.2	9.2	3.9
Outstanding International Bonds 1/	5.7	13.3	7.6	2.9

Sources: IMF, Annual Report; and BIS, Quarterly Review and Triennial Central Bank Survey.
1/ The data for 1980 is the average for 1981-84.

G. What Are the Implications for the Internationalization of the Won?

20. **Reaching the status of an international currency could be difficult, but the use of the won in international financial transactions is expected to increase.** There are only few currencies in the world with extensive international use as a medium of exchange, store of value and unit of account. Given the preeminence of these currencies and their underlying global economic, trading and financial strength and even assuming the continuation of the Korean's economy performance, it is highly unlikely for the won to challenge these currencies as international currencies. However, the won could become an active currency in international financial transactions and as a currency of denomination for financial assets, and this should help develop Seoul as a financial center.

21. **Internationalization of the won should not precede the deepening of financial markets and the strengthening of the institutional framework.** A policy of internationalization of the won which promotes the international use of the currency would increase the economy's exposure to sharp movements in capital flows. Ensuring that large cross-border flows do not adversely affect the economy would in turn require an efficient financial system and liquid capital markets able to deal with fluctuations in exchange rates and to manage risks adequately. In this context, having a strong institutional framework and supervisory regime is key.

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invoicing. It is also due to the fact that Japanese exporters tend to denominate their invoices in foreign currencies in order to maintain their market shares.

[10] See Murase (2000).

22. **Looking ahead, the authorities should further promote the development of the financial system.** First of all, while the banking system has improved considerably, it is still largely domestic which limits markedly the offshore use of the won. With the Korean banking market approaching maturity, its expansion overseas is expected to accelerate. Second, capital markets need to deepen further, especially for the money and bond markets where liquidity is still an issue; promoting the emergence of various types of investors as well as help shift the intermediation away from a broker system to a market-making mechanism would help. In this respect, the Capital Market Consolidation Act is likely to provide a significant boost.

23. **But more generally, as the Korean financial sector undergoes a major transformation, it will be important for the supervisory system to adapt.** Of course, an open and transparent regulatory and supervisory system is a prerequisite. The move to risk-based supervision and management practices for financial institutions, as planned under Basel II, should help. Such a system should also provide stability and predictability. Moreover, the liberalization of cross-border transactions, as called for under the Foreign Exchange Master Development Plan, should be complete and the authorities should shift their role from the monitoring of foreign exchange transactions to that of monitoring the foreign exchange market.

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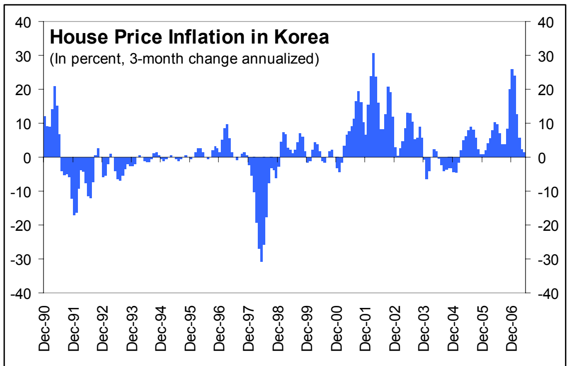
IV. The Mortgage Market in Korea: Financial Risks and Development Needs[1]

1. **Recent developments in Korean housing and mortgage markets have been a focus of regulators' attention to emerging risks.** Because of the high degree of collateralization and a reliance on relatively short-term floating rate loans, the financial risks of mortgages to lenders have been low in Korea. However, the structure of mortgages has placed a higher risk burden on borrowing households, which have a weakened financial capacity because of a high debt burden. A key developmental need, then, in the Korean mortgage market is to promote innovations—such as fixed-rate conventional mortgages and mortgage securitization—that lessen risks to households while maintaining the soundness of financial institutions. Recent trends have moved in this direction but further development is needed.

A. Mortgage Market Risks

2. **Rapidly rising house prices in 2006 created concerns among the Korean authorities about a potential bubble.** Housing prices rose by 11 percent nationwide for the year, but by much more in selected areas, in particular within Seoul. While the recent house price gains in Korea were within the historical range of house price volatility and fell short of a nationwide boom or the widespread surges in countries like Australia, New Zealand and the United States, the authorities were geared toward the side of caution. Korea had experienced episodes of severe financial distress following the Asian crisis and in 2003 with the collapse of the credit card boom. These experiences have sensitized Korea to the prospects of rapidly emerging financial crises.

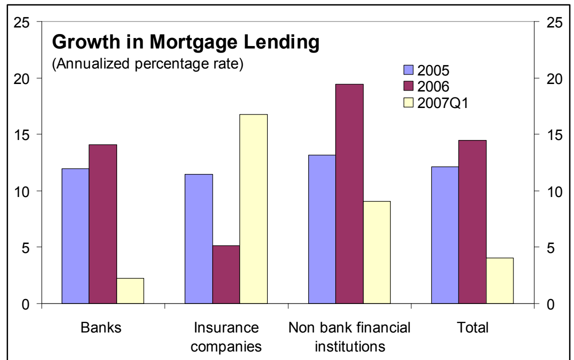


Source: CEIC Data Company Ltd.

3. **The authorities undertook a broad range of actions to suppress the rise in house prices.** These included tax measures, selected price controls, and strengthened prudential regulations on the terms of mortgage financing for house purchases, specifically a tightening in late 2006 of loan-to-value (LTV) ratios and debt service-to-income (DTI) ratios for mortgages in localities experiencing price surges.

[1] Prepared by Edward Frydl.

4. **Both house prices and growth in new mortgages have moderated significantly in 2007.** The various policy actions appear to have played a role, although the slowdown may also reflect in part the delayed effect of higher interest rates and the high prices themselves. The deceleration of mortgage lending has been concentrated in commercial banks, which were most directly impacted by the tighter prudential regulations. In contrast, insurance companies and other nonbank financial institutions have continued to lend at buoyant rates, accounting for well over half of mortgages written in the first quarter of 2007, as opposed to just over 20 percent of mortgages outstanding.



Source: Financial Supervisory Service.

5. **Another recent development is that bank lending to small and medium enterprises (SMEs) has accelerated as household mortgages have slowed.** This raises the prospect that funds raised through small business loans may have been effectively channeled into the housing market to avoid tighter mortgage restrictions, a possibility especially in the so-called SOHO (small office, home office) segment, which is extensive in Korea. An investigation by the Financial Supervisory Service (FSS) in 2007 found several hundred instances (totaling over 150 billion won) of business loans misused for purchases of houses and the authorities are sanctioning offenders. On the other hand, this leakage has not been significant enough to prevent a marked deceleration of house price inflation.

6. **In general, financial institutions in Korea are not exposed directly to major risks on mortgage lending.** Most of the risks on mortgages are borne by borrowers. Household mortgages in Korea have typically been 3-year floating-rate bullet loans. This short tenor without amortization is a peculiar feature of the Korean market that is absent from other Asian countries as well as advanced financial sectors (CGFS, 2006; Chiquier, 2006; Zhu, 2006). Floating rates protect the lender from interest rate risk and the short maturities pass the liquidity risk onto the borrowing household. Since mortgages typically do not amortize, they are paid off at the sale of the property or rolled over. This condition leaves the borrower exposed to the risk of failing to qualify for a rollover if either the house price falls sufficiently, leaving the loan undercapitalized, or if the borrower's income falls enough.

Characteristics of Mortgage Products 1/

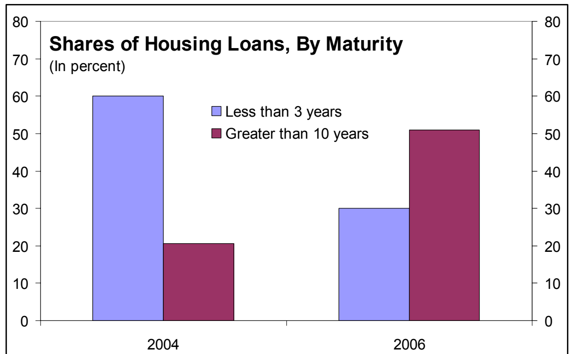
	Typical length of contract (years)	Average LTV (percent)	Max LTV (percent)	Rate type
Korea	3, max 20	56	70	Variable
Australia	25	60-70	90-100	Variable
Hong Kong SAR	15		70	
Japan	20-30	70-80		Fixed (mixed)
Singapore	30-35		80	Variable
Malaysia	max 30		80	Variable
Thailand	10-20; max 30	70-80	90-100	Variable
United States	30	76		Fixed
Italy	5-20	55	80	Variable (mixed)

Source: Veronica Warnock and Francis Warnock, "Markets and Housing Finance", University of Virginia, April 2007.

1/ Data represent annual averages or maximums for the period 2001-2005.

7. **To guard against this outcome, lenders have required relatively stringent LTV ratios even apart from the government's recent tightening of prudential terms.** On average, the LTV ratio in Korea is slightly over 50 percent, significantly below comparable markets. This high collateralization protects lenders against credit risk on the loans but requires borrowers to provide a large amount of their own funds for down payments. The stringency of the LTV requirements also creates the incentive to utilize funds borrowed from other channels to qualify for bank mortgages. This incentive intensifies the need for closing any remaining gaps in the credit information system regarding the full extent of borrowers' indebtedness so that lenders can make appropriate credit decisions about borrowers' debt servicing capacity.

8. **Mortgage structures have changed dramatically in the last several years.** Loan maturities have lengthened in response to government encouragement and tax incentives that allow deductibility of interest on longer term mortgages. Between 2004 and 2006, the share of outstanding mortgages of maturity 3 years or less fell from 60 percent to 30 percent, while the share of over 10 years maturity rose from 21 percent to 51 percent. Over the same period, the share of amortizing mortgages rose from less than one quarter to more than one half. Some borrowers shifted to an amortizing loan with a 3–5 year grace period and may face debt-servicing difficulties when payments jump with the inclusion of amortization.



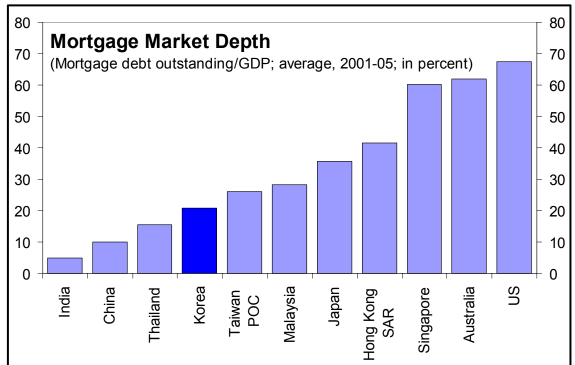
Source: Financial Supervisory Service.

B. Mortgage Market Development

9. **The mortgage market in Korea has a number of development needs.** In terms of overall size relative to the economy, mortgage markets in Korea lag advanced financial centers and other prominent Asian emerging markets. Beyond overall market depth, there is also a need for greater development of fixed-rate conventional loans and mortgage-backed securities (MBS). Korea is well poised to catch up, however, since its macroeconomic environment and financial infrastructure are generally strong.

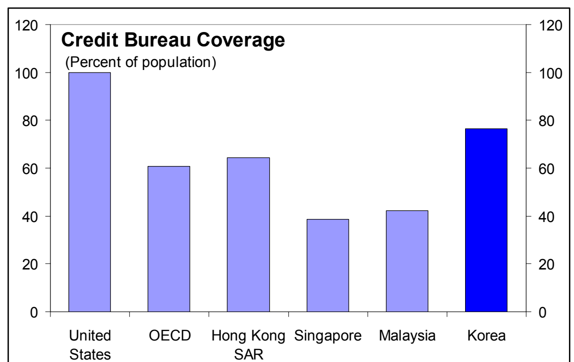
Market Depth

10. **The mortgage market in Korea is relatively undeveloped compared to other advanced and emerging market economies.** The depth of the market, measured by the ratio of outstanding mortgages to GDP, is below other Asian centers such as Hong Kong SAR, Singapore and Malaysia, as well as most other OECD countries. This relative lack of development seems to be less rooted in the broad features of financial infrastructure in Korea than in the specific features of the mortgage market, including the relatively recent introduction of securitization features.

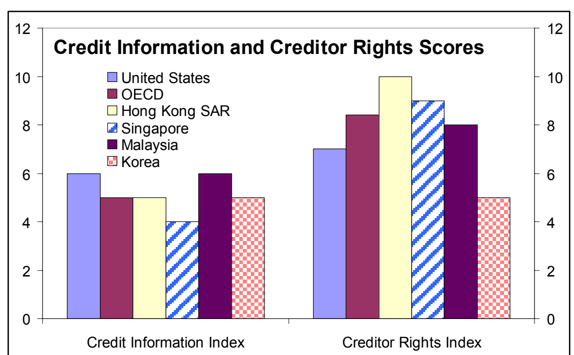


Source: Warnock and Warnock (2007).

11. **Korea has the financial infrastructure to support mortgage market development.** A recent cross-country empirical study of determinants of mortgage market depth (Warnock and Warnock, 2007) highlights three broad features that are significant in market development: credit information, creditor rights, and macroeconomic stability. Credit information relates to features such as the existence of a comprehensive credit bureau and privacy laws that are not overly restrictive. Creditor rights encompass features such as a general rather than specific description of assets and liabilities in contracts; a unified property registry; priority of claims for secured creditors and the ability to seize collateral outside of court. Macroeconomic stability is measured by low inflation volatility, which has been a feature of Korea's economy in recent years. The country is relatively strong in terms of credit bureau coverage compared to the OECD as well as other Asian centers. It is similarly strong on credit information quality but lags other advanced and emerging financial centers somewhat in terms of creditor rights scores. Overall, these features bode well for the future development of Korea's mortgage market.



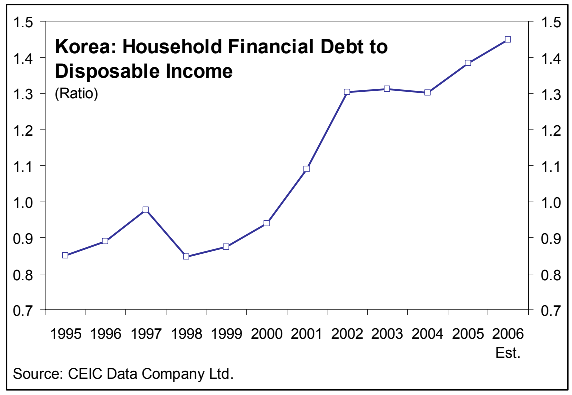
Source: World Bank, Doing Business database.

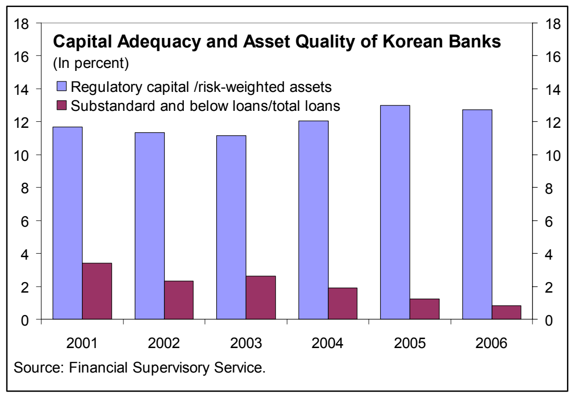


Source: World Bank, Doing Business database.

Benefits of Market Development

12. **The development of the mortgage market in the direction of generating long-term fixed-rate conventional mortgages and MBS has a number of potential beneficial effects.** It eases qualification for financing for home purchases and promotes home ownership and develops the capital market through providing a steady stream of long-term debt instruments for institutional investors with a long maturity horizon. Beyond that, however, mortgage market development would work to improve overall financial stability in the Korean context by shifting more of the risk bearing in housing finance onto banks and the capital markets in general and away from households. Korean households have built up relatively high levels of debt relative to income, reaching levels comparable to countries such as Japan and the United States. Korean banks, however, have improved their financial condition in recent years, raising their capital adequacy, asset quality and profitability. The developing trends to lengthen maturities and shift from bullet to conventional loans redistribute the balance of risk taking in a stabilizing fashion.





13. **The effect of mortgage securitization on financial system risk is complicated.** Where competition leads banks to seek to expand market share, credit risks on property loans may be underpriced and may lead to an asset price bubble. In such circumstances, securitization can improve financial stability by prompting originators to price risk more realistically in order to maintain the marketability of the MBS that is generated (Green and others, 2007). On the other hand, as recent developments in the U.S. sub-prime market have shown, when securitization is highly liquid and credit assessment is effectively delegated by interested parties (say, to rating agencies), MBS can contribute to a weakening of risk assessment. In the Korean situation, since the undeveloped state of MBS suggests that the liquidity benefits of market development are high, it is important for supervisors to make sure through the examination process that both mortgage originators and regulated MBS buyers adhere to good standards of risk assessment in order to preserve the benefits.

Fixed-rate Mortgages

14. **Long-term conventional mortgages have been slow to develop.** At present, fixed rate and mixed loans are about 6 percent of the market. Borrowers have been reluctant to take fixed-rate mortgages. Rates faced by household borrowers have been in a significant long-run decline, creating weak expectations of significant rate increases. Against this background, the prevailing rate differential favoring variable-rate loans has been the dominant consideration. Conditions for fixed rate loans may, however, be turning more favorable. Since mid-2005, consumer rates have been in a modest uptrend and in 2007 the rate differential on fixed-rate mortgages has fallen on average to 20 basis points from 55–60 in late 2006. Recent increases in the 91-day CD rate, to which variable mortgage rates are tied, have squeezed the profit margin on floating-rate mortgages and started to push rates up, closing the gap versus conventional mortgage loans.

Mortgage–Backed Securities (MBS)

15. **There is considerable scope for MBS to develop in Korea.** Although Korea has a relatively large bond market among Asian countries and a well-developed asset-backed securities market (Lee, 2002; Chiquier and others, 2004; You, 2005; Chan and others, 2006), MBS is a relatively small share. The share of MBS among debt securities has increased only marginally, even in the face of the government's tightened prudential regulations that promote the use of longer maturities, which would favor securitizable mortgages. The share of MBS among Korean debt securities rose from 1.37 percent at end-2005 to 1.55 percent in March 2007. At end-March 2007, MBS represented only 3.4 percent of outstanding mortgage loans. Growth has thus far been inhibited by the rate advantage for floating-rate mortgages and the consumer's reluctance to make the higher monthly cash payments on conventional mortgages.

Size of Bond and MBS Markets 1/
(Amounts outstanding, in billions of US dollars)

		MBSs		Bonds				MBSs+ Bonds
	Date	Housing agency	Private	Housing agency	Financial and corporate 2/	Government	Non-resident	Share of housing agency debt securities 3/
Hong Kong SAR	Dec 01	0.0	0.1	2.6	8.2	6.8	3.6	14.7
	Mar 06	0.6	0.0	4.0	10.8	8.8	4.0	19.0
India	Jun 02	0.1	...	5.3	0.0	134.8	0.0	3.9
	Jun 05	0.2	...	28.4	15.8	243.8	0.1	9.9
Japan	Mar 02	1.5	6.1	16.6	1,314.1	3,166.3	57.0	0.4
	Mar 06	27.2	60.4	33.1	1,211.9	5,501.8	57.1	0.9
Korea	Dec 01	1.5	...	0.0	213.2	65.8	0.2	0.5
	Dec 05	8.3	...	1.5	356.7	226.0	0.0	1.7
Malaysia	Dec 01	0.0	0.0	5.6	36.0	30.9	0.0	7.7
	Dec 05	1.5	0.0	6.4	47.4	50.4	0.2	7.5

Sources: Citigroup; government housing agencies; and BIS.
1/ Excluding money market instruments.
2/ Excluding housing agency bonds and MBSs as well as private MBSs.
3/ As a percentage of total bonds and MBSs.

The Role of the Korea Housing Finance Corporation

16. **In 2004, the government established the Korea Housing Finance Corporation (KHFC) to promote the development of long-term conventional fixed-rate mortgages and MBS in Korea.** The KHFC sets terms and conditions of mortgages that it will purchase from cooperating originating institutions. Generally, these are fixed-rate conventional mortgages up to 20 years maturity and 70 percent LTV with prepayment penalties. KHFC, in turn, packages these loans into mortgage pools that support the issuance of MBS of various maturities that are sold to investors. The principal investors are commercial banks, insurance companies and investment trusts, with the longer term investors taking a relatively large share compared to their shares of debt securities in general.

17. **KHFC takes on several risks to effectively subsidize mortgage market development.** At present, the KHFC assumes important residual risks related to conventional mortgage generation and securitization. It guarantees the payment of interest and principal on the senior tranches of securitized MBS. In addition, it holds on its own account the subordinate MBS tranche, which carries the greatest credit and prepayment (liquidity) risk, which KHFC manages chiefly thorough the use of a graduated schedule of prepayment penalties on the underlying mortgages. It also guarantees mortgages to low-income borrowers and guarantees no loss to lenders on reverse mortgages (a new, but potentially significant, product given Korea's aging population) even if the residual equity value on the underlying property is exhausted before the borrower dies. Fundamentally, these risks are covered by the Korean government, which supports the KHFC.

18. **Given the potential benefits from development of the conventional mortgage market and mortgage securitization and the existing small scale of such activity, it is reasonable for KHFC to play this supporting role.** But as the market for conventional and reverse mortgages grows, the relative volume of contingent liabilities will likely increase significantly. The continued growth of the market will depend a good deal on maintaining the financial credibility of the KHFC. This will require a plan for phasing down the extent of subsidization through guarantees. This is a longer term problem, however, and the current small scale and growth of risks does not make such planning a priority. More useful would be to focus near-term efforts on the development of new derivatives products that would be useful in managing market and prepayment risks, such as over-the-counter interest rate options.

C. Policy Implications

19. **While mortgages do not pose an imminent threat to financial sector stability, there are areas where risk management can be improved and development enhanced.**

- *Prudential regulation of mortgage lending should strive to be functionally based and not applied differentially across classes of institutions or geographic areas.* Standardizing prudential regulations has the benefit of reducing loopholes and promoting the securitization of the underlying mortgages, which contributes to capital market development. Applying differential prudential rules governing mortgage loans to different types of institutions creates incentives for borrowers to exploit regulatory arbitrage. Institutionally differential regulatory treatment should, therefore, be limited and, where necessary, applied at the broadest practical levels, such as minimum required capital ratios. The application of more restrictive prudential requirements to speculative zones risks fragmenting the underlying mortgage market. The lack of standardization on LTV and DTI complicates the pooling and securitization of the mortgages. In this regard, the authorities' recent steps to extend standard credit screening rules, including DTI rules, to nonbank mortgage originators is welcome.

- *Efforts to promote credit information sharing among lenders should be broadened.* Credit bureaus should coordinate and integrate consumer and small business credit information sources to generate a truer picture of the debt exposures of underlying individuals.[2]

- *Market initiatives to promote fixed-rate mortgages can be taken.*

    - A broader range of over-the-counter derivatives hedges should be developed in terms of interest rate options to cover pre-payment risk on fixed-rate loans. The authorities' relatively restricted approach to granting OTC derivatives licenses, especially for foreign firms, limits the degree of product innovation.

    - A liquid long-term government bond benchmark should be developed to facilitate the pricing of conventional mortgages.

- *The KHFC can take specific actions to develop further fixed-rate mortgages and MBS.*

    - The KHFC should widen its list of participating institutions through which fixed-rate loans are originated. At present, several participating banks appear to be reluctant to promote the use of the KHFC fixed-rate mortgage because they see it as a competitive product to their own variable-rate loans, which are an attractive asset that they want to hold on their balance sheets. Broadening

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[2] An example of existing gaps is the following. Presently, Korea Credit Bureau (KCB), the consumer credit bureau, and Korea Enterprise Data (KED), the SME credit bureau, operate under a limited information-sharing arrangement. If a lender wants to check for a SOHO credit, KED will check with KCB to provide the personal credit review. However, no automatic review of business credit is generated by a personal loan check.

the list of participating institutions would heighten competition in originations to promote the spread of fixed-rate loans.

- As risk management capabilities within the financial sector improve, the KHFC should lessen the prepayment penalties it imposes on its fixed-rate loans to make them more attractive to borrowers.

- The KHFC may consider offering credit enhancement for the senior tranche on private sector residential MBS. An increased role for the KHFC as a third-party guarantor can allow it to pare down its risk by reducing its holdings of subordinated tranches on its own direct securitizations.

- Finally, the KHFC could consider purchasing adjustable-rate capped mortgages from originating institutions, as opposed to buying only conventional loans on KHFC-specified terms. This would accelerate the MBS process, since most existing mortgages are floating rate. However, experience in other countries with securitizing floating rate loans is relatively limited and managing the interest rate risk is more complicated. Also, this activity works against the promotion of fixed-rate loans by making variable-rate mortgages more liquid to originators. The KHFC would therefore need to balance its dual objectives of promoting the fixed-rate instrument and the growth of MBS.

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