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Republic of Korea: Selected Issues

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International Monetary Fund
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INTERNATIONAL MONETARY FUND

REPUBLIC OF KOREA

Selected Issues

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Approved by Asia and Pacific Department

August 4, 2010

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I. LOCAL CHALLENGES IN GLOBAL KOREA: REBALANCING WITH LEVERAGE[1]

This paper analyzes the implications of global rebalancing in the post-crisis period for Korea and how high leverage in the household and small- and medium sized enterprises (SMEs) sectors could affect this process. Unlike in some other economies, most of the region, rebalancing in Korea is not about reducing excessive current account surpluses, but finding domestic engines of growth to reduce the export dependence of the economy and improve its resilience to external shocks. In fact, consumption and investment in Korea appear in line with that of peers, but there are limits to how much they could be sustained in the post-crisis world to pick up the slack from lower external demand. To avoid the buildup of vulnerabilities from high leverage, households have to increase their saving rate limiting consumption growth. On the other hand, export-oriented and large corporates may need to invest less with lower export demand increasing corporate savings further. This would leave small and medium sized enterprises (SMEs) in the nontradable sector as the engines for investment, employment, and household income growth, increasing the urgency to address their long-standing structural problems and weak balance sheets. Delaying the necessary adjustment would increase costs and financial vulnerabilities. Improving social safety nets and the pensions system would be important to manage the adjustment costs while increasing labor market flexibility.

A. Introduction

1.   **The global crisis has highlighted the importance of rebalancing growth for many economies in Asia** to lessen their dependence on exports, improve their resilience to external demand shocks, and sustain high growth rates in the face of waning exports to advanced economies as they repair their balance sheets.

2.   **Within the region, Korea stands out in many aspects.** Although the Korean economy remains heavily dependent on the tradable sector, Korea's current account surpluses have not been excessive. This is reflected in consumption and investment levels consistent with Organization for Economic Cooperation and Development (OECD) averages. This paper argues that rebalancing growth in Korea would not simply mean sustaining domestic demand growth but also shifting production, investment, and employment structures tied to export-oriented industries to nontradables. This shift would require finding new domestic engines of growth that can be financed by healthy balance sheets. However, Korean households and SMEs, the key actors to generate this shift, are highly leveraged. This
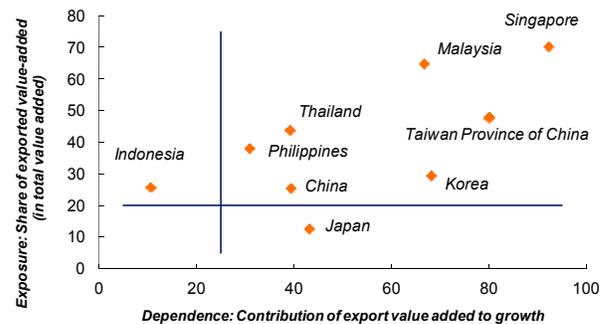
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could limit their ability to facilitate the new engines of growth and would require an appropriate sequencing of policies to minimize adjustment costs.

3.   The first section of the paper discusses the implications of global rebalancing for Korea using simulations from the IMF's Global Integrated Monetary and Fiscal Model (GIMF). The second section focuses on how rebalancing growth in Korea is different from the rest of the region and discusses the challenges of highly leveraged households and SMEs for the rebalancing process. The last section concludes with policy recommendations.

B. Implications of Global Rebalancing for Korea
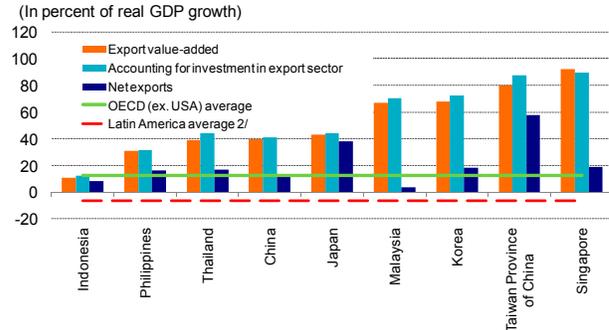
4.   **Economic growth in Korea depends heavily on external demand.** Although Korea's export "exposure"—defined as the share of value added linked to external demand— at 30 percent, is not one of the highest in the region and not excessive relative to the OECD, exports have remained the engine of growth contributing 68 percent to growth between 2001 and 2007. This may be surprising when contrasted with the contribution of net exports to growth in national accounts, which accounted only for 18 percent of growth in the same period, albeit well above the OECD averages. This is because the net export-based measure understates the dependence of incomes on external demand if incomes are spent on imports whereas the value added-based measure captures this effect.[2] When the share of domestic investment tied to exports is also accounted for, Korea's exposure to external demand would go up by 4 ppt to 34 percent and total contribution of export value added to growth would reach 73 percent.

Selected Asia: Export Dependence and Exposure
(In percent)

Sources: Japan External Trade Organization (JETRO) Asian Input Output Table (2000); OECD; UN COMTRADE; CEIC Data Company Ltd.; Haver Analytics; and IMF staff estimates.

Selected Asia: Average Contribution to Real GDP Growth[1]
(In percent of real GDP growth)

[1] Average of contributions to three-year growth rates between 2001-07. Exchange rate adjusted deflator.
[2] Latin America includes Argentina, Bolivia, Brazil, Chile, Colombia, Mexico, Peru, Paraguay, Uruguay, and Venezuela.

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[2] Export-based measures will also overstate the role of exports as a source of growth, as increasing vertical trade integration means that exports include a declining share of domestically produced value added. Asian international input-output (AIO) tables were used to measure the extent to which the value added produced in an economy can be attributed to domestic, intraregional, and extra-regional demand. For details see *Regional Economic Outlook*, April 2010: http://www.imf.org/external/pubs/ft/reo/2010/APD/eng/areo0410.htm

5.   **Notwithstanding increasing intra-regional trade and the emergence of China as a final destination of its exports, the advanced economies remain the most important source of external demand for Korea.**
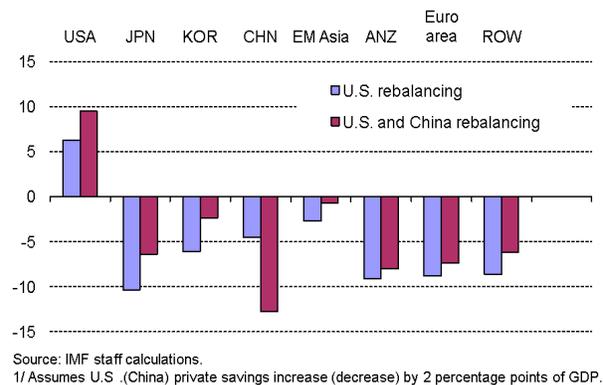China is now Korea's biggest export market (23 percent of total exports) and cyclically export growth to China was a key reason behind the rapid recovery from the Great Recession. Nonetheless, Korea lags behind Taiwan Province of China, Malaysia, Singapore, and the Philippines in benefiting from growing domestic demand in China.

Selected Asia: Share of Export Value Added in GDP
(In percent)

Sources: AIO 2000; and IMF staff estimates.

6.   **As a result, the deleveraging in advanced economies in the post-crisis period will mean lower external demand for Korea.** Simulations with an expanded version of the IMF's GIMF model were used to assess the implication of a rebalancing in the United States on Korea.[1] A decline in external demand associated with a 2 ppt permanent increase in the U.S. private savings rate could reduce Korean exports by 6 ppt and GDP growth by 1 ppt over the next three years from their respective current IMF baseline forecasts. Furthermore, a similar rebalancing of growth in China—through lower private savings—alone will not fully offset the lack of external demand from the United States. Positive spillovers from greater Chinese demand would at best mitigate 40 percent of the adverse shock on

Export Impact from U.S. and China Rebalancing[1]
(Cumulative percent difference from baseline in 3 years)

Source: IMF staff calculations.
1/ Assumes U.S .(China) private savings increase (decrease) by 2 percentage points of GDP.

Korea. One important reason is that, despite high growth, China has remained a marginal importer of consumer goods—accounting for only 3 percent of global imports—while the United States still dominates global imports, both in terms of direct and indirect trade linkages. At current speeds, it would take another decade for China to take over from advanced economies in leading export value added in Korea, notwithstanding the adjustment
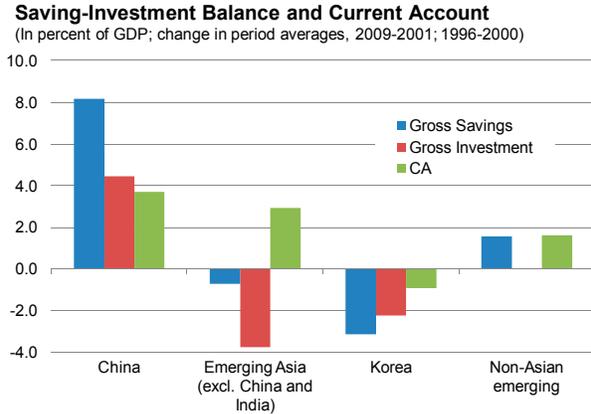
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[1] For technical details of the model see N'Diaye et al. (2010). Simulations are from Regional Economic Outlook, April 2010.

costs to reorient production to the Chinese customer basket, which is quite different than that in advanced economies.[2]
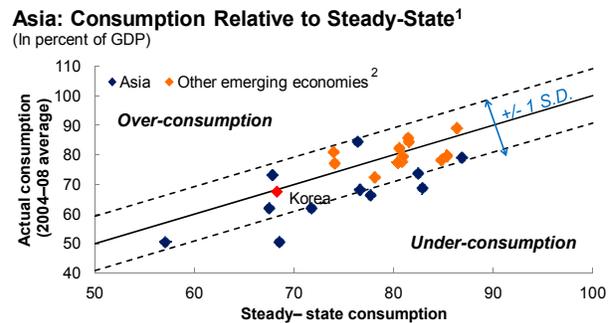
C. How can Korea Rebalance its Growth?

7.   **Despite its high export dependence, Korea has small current account surpluses, which mask shifts in underlying balance sheets of the households and corporates.** Korea's current account surplus is not excessive and, unlike most of the region, has been declining since the Asian crisis. This trend is driven by a larger decline in savings than in the region—although investment has also declined (see below). In addition, unlike most of Asia, this reflects a larger increase in corporate savings that has been largely offset by lower household savings.

8.   **High leverage of the household sector could limit consumption growth in the post-crisis world.** Consumption growth in Korea is consistent with fundamentals and at par with peers in the OECD. However, it has been sustained by increasing debt levels, making Korean households one of the most financially leveraged, with household debt reaching 80 percent of GDP. Leverage is even higher when real wealth is considered, despite the relatively lower diversification of Korean households into financial assets. The increase in leverage has also coincided with a sharp drop in the household saving rate (see Karasulu, 2010). As the recent U.S. experience, it shows that debt-financed consumption growth cannot be

Saving-Investment Balance and Current Account
(In percent of GDP; change in period averages, 2009-2001; 1996-2000)

Source: WEO.

Asia: Consumption Relative to Steady-State[1]
(In percent of GDP)

[1] Based on staff estimates of S-I balance using the CGER's Macroeconomic Balance approach.
[2] Other emerging economies include Argentina, Brazil, Chile, Colombia, Egypt, Israel, Mexico, Morocco, Pakistan, Peru, South Africa, and Turkey.

Debt as a Percent of Net Wealth 1/

Sources: OECD; and IMF staff estimates.
1/Net wealth is defined as nonfinancial and financial assets minus liabilities. For Japan and Germany the latest observation is 2007 and for UK 2008.

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[2] Measured by an import similarity index based on SITC-5 digit data comprising over 300 line items for consumer goods, the consumer goods basket imported by China overlaps by only about 35 percent with that in other advanced economies.

sustained forever without the buildup of substantial vulnerabilities, although in Korea this is not driven by external indebtedness. This would mean that households would have to deleverage either by curtailing consumption growth or by increasing incomes or a combination of both.
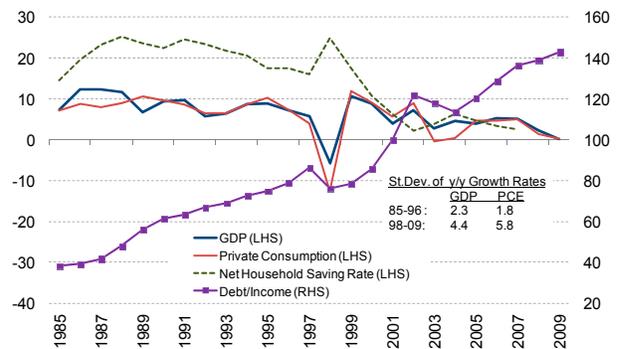
9.   **The structure of household lending has limited financial risks but increased consumption volatility.** In fact only about one-third of household debt in Korea is tied to residential mortgages (two-thirds in the OECD on average) and strict loan-to-value and debt-to-income-regulations limit excessive leveraging through home ownership.[3] Nonetheless, 90 percent of household loans are at floating market interest rates making household consumption more vulnerable to interest rate shocks and the business cycle.[4] As a result─and despite wider access to finance─consumption volatility has increased three-fold since 1998, and rather than smoothing aggregate activity, consumption now amplifies its volatility.

Growth, Private Consumption and Saving Rate
(y-o-y growth, percent)

St.Dev. of y/y Growth Rates	GDP	PCE
85-96 :	2.3	1.8
98-09:	4.4	5.8

GDP (LHS)
Private Consumption (LHS)
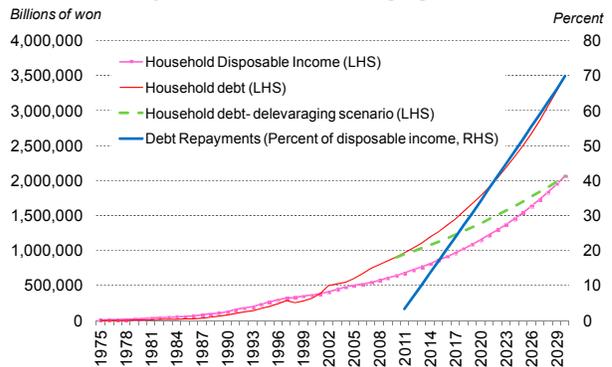Net Household Saving Rate (LHS)
Debt/Income (RHS)

Source: CEIC Data Company Ltd.

10.   **Consumption growth will depend on the amount of leverage that can be sustained by households.** Finding the optimal nexus of consumption and leverage for the household sector is not straightforward and would depend on the extent to which the buildup has reflected structural and cyclical factors, such as financial deepening and a low interest rate environment, and the degree to which the substantial increase in households' gearing has been excessive and needs to be unwound. Nonetheless, a simple model of household debt dynamics can be used to demonstrate the unsustainability of the current path. Assuming an effective nominal interest rate on existing household debt of 6 percent and a future nominal growth rate

Scenario Analysis: Gradual Deleveraging
Billions of won   Percent

Household Disposable Income (LHS)
Household debt (LHS)
Household debt- delevaraging scenario (LHS)
Debt Repayments (Percent of disposable income, RHS)

Source: CEIC Data Company Ltd.

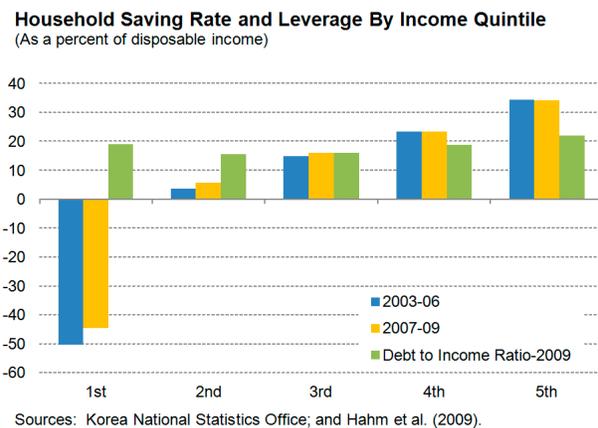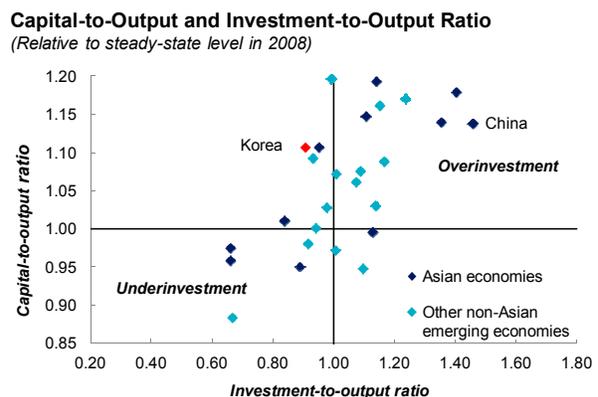[3] See Frydl (2007) for a discussion of the mortgage markets in Korea.

[4] In the United States (2005), EU (2004) and United Kingdom (2004) variable rate mortgages constituted 31, 46 and 72 percent of all mortgages, respectively. The loan-to-values (LTV) in Korea have been declining against the global trend, going down from 56.4 at end-2004 to 47 at end-2007. The global average is 80 percent.

of disposable income of 6 percent—both reflecting recent averages—debt-to-income ratio would stabilize around the current 140 percent. However, regulatory tightening globally and in Korea and a gradual return to neutral interest rates are expected to increase carrying cost of debt and limit credit growth forcing deleveraging. A gradual 200 bps increase in interest rates from this baseline by 2013 and a decline in the debt-to-income ratio to 100 percent by 2030 would require households to spend an improbable 70 percent of projected disposable income by 2030 on debt repayments leaving little to consume. Obviously, these numbers are illustrative and meant to demonstrate the potential constraints on consumption growth even a gradual deleveraging would entail. Even in the absence of deleveraging, sustaining consumption growth with higher carrying costs would be difficult and would act as a medium-term drag on overall economic activity, but especially on SMEs, who depend more on domestic demand.

11.   The adjustment of households' balance sheet is unlikely to be uniform across households as the most rapid debt growth has been registered at the top and bottom income levels. While high income households seem to have borrowed heavily to invest in real estate, low-income households tend to do so for consumption. It is estimated that more than 13 percent of households in the bottom 20 percent income group have debt payments over 40 percent of their income (Hahm, et al.

Household Saving Rate and Leverage By Income Quintile
(As a percent of disposable income)

Legend: 2003-06; 2007-09; Debt to Income Ratio-2009

Sources: Korea National Statistics Office; and Hahm et al. (2009).

2009). To the extent low-income groups tend to have a higher marginal propensity to consume, the impact of deleveraging on aggregate consumption could be even higher.[5]

12.   Slower export growth in the post-crisis period could also limit domestic investment. While current aggregate investment levels in Korea are close to their long-term average and still high by developed country standards investment growth since the Asian crisis has been driven by larger companies, who also

Capital-to-Output and Investment-to-Output Ratio
(Relative to steady-state level in 2008)

Korea; China; Overinvestment; Underinvestment; Asian economies; Other non-Asian emerging economies

Capital-to-output ratio (y-axis); Investment-to-output ratio (x-axis)

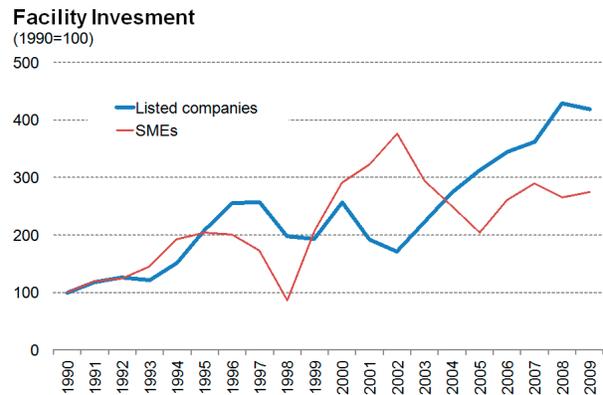Sources: Penn World Tables; IMF, WEO database; and staff calculations.

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[5] Karasulu (2008) estimates that low-income groups' propensity to consume out of current period income is about five times as high as that of the overall population.
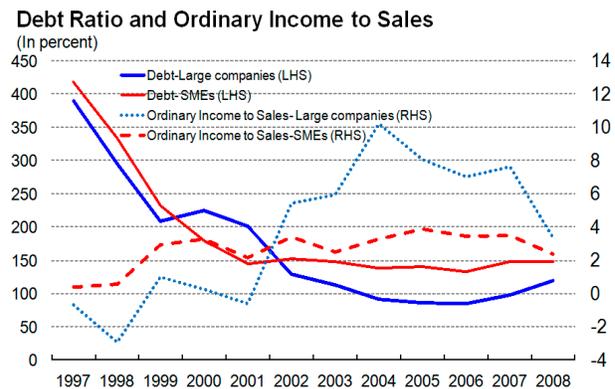
dominate Korea's exports. [6] Slower export growth in the post-crisis world could lead large cooperates to reduce domestic investment, even as they increase FDI to the region to benefit from lower labor costs elsewhere.

13.   **The only offsetting factor would be investment by domestically oriented companies, the majority of which are SMEs.** However, unlike the chaebol, the SMEs have lagged behind, largely reflecting weaker fundamentals in the aftermath of the Asian crisis. Small firms also tend to dominate the services sector (representing around 85 percent of firms), where productivity growth has been lackluster.[7] Looking ahead, a vibrant SME sector, especially in the nontradable sector will be vital for investment growth and sustaining high rates of growth. With their decades' long focus on export-oriented manufacturing, large corporates do not have the experience or the incentives to invest in services. In addition, should they reorient themselves to the nontradable sector, this could have implications for domestic competition policy.
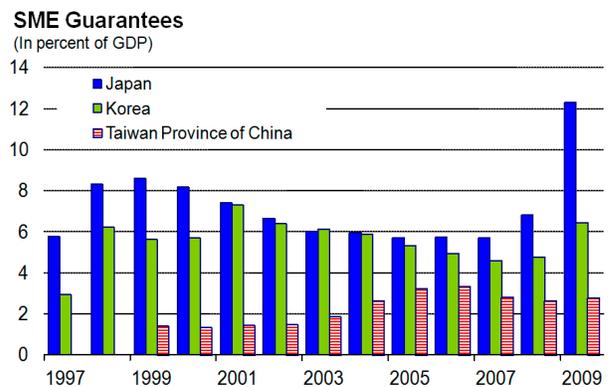
14.   **However, the rapid expansion of credit guarantees for SMEs after the Asian crisis and the Great Recession have held back needed restructuring.** Between 1997–2001, SME credit guarantees roughly doubled in size, reaching a peak of nearly 8 percent of GDP, compared to only 1.5 percent of GDP in Taiwan Province of China, 0.2 percent in the United States and 0.6 percent in France. Unwinding such

Facility Invesment
(1990=100)

Sources: The Federation of Korean Industries; and IMF staff estimate.

Debt Ratio and Ordinary Income to Sales
(In percent)

Source: BOK Financial Statement Analysis.

SME Guarantees
(In percent of GDP)

Source: IMF staff estimates.

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[6] Pre-1998 investment levels were at historic highs despite relatively subdued corporate indicators, and are difficult to rationalize based on economic fundamentals. See Syed (2007).

[7] Productivity in services in Korea is relatively low at 58 percent of the manufacturing and 44 percent of the U.S. service sector. For a deeper discussion of problems in the services sector see Chensavasdijai (2006).

support has also proven difficult. The size and coverage were only partially pared back during the subsequent recovery, and rose again following the Great Recession, reaching 6 percent of GDP (the highest in non-Japan Asia). In addition to expanding the size of guarantees, their coverage was also increased and terms made more generous, although the authorities are in the process of scaling them back to pre-crisis levels.

15.   **Furthermore, SME guarantees favor repeat clients and do not provide incentives to banks to develop new instruments suitable for the SMEs in the services sector.** Given the high degree of coverage, Korean banks tend to direct loans to those SMEs that can secure credit guarantees which overwhelmingly are well established firms.[8] Although these guarantees are typically given for only one year, they are usually rolled over, or were required to be rolled over following the global crisis. Therefore, the bulk of guarantees outstanding are directed toward existing firms, creating a barrier to new entrants. As a result, low profitability of existing SMEs and the financing constraints for the newcomers limit their ability to invest.

16.   **In addition to the guarantees, policy support to SMEs through other channels is sizable.** Besides the loans of the dedicated policy banks (IBK and KDB) and the government-run Small Business Corporation, SMEs also benefit from regulatory lending recommendation on banks. [9] Domestic banks are strongly recommended to allocate a certain portion of their won loan book to SMEs. Commercial banks are recommended to keep this portion above 45 percent and for regional banks the recommended target is 60 percent. Foreign branches are recommended to keep it above 25 or 35 percent, depending on their use of the Bank of Korea (BOK)'s discount window. For mutual savings banks and credit specialized financing companies,[10] loans to SMEs must be between 30 to 50[11] percent of total outstanding loans. In addition, the BOK operates a credit facility at favorable terms for on-lending to SMEs.
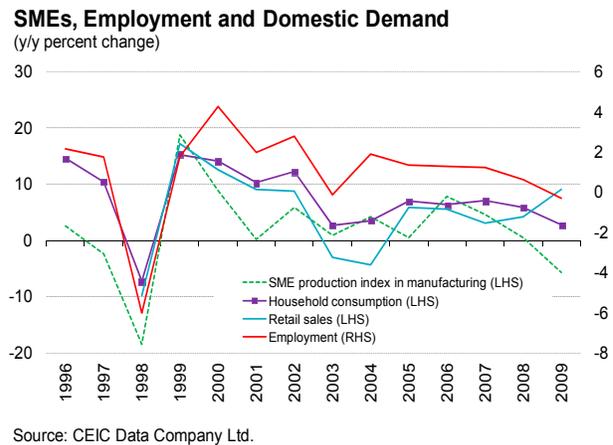
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[8] While more than 70 percent of KCGF guarantees have a one-year maturity, the typical firm has been under Korea Credit Guarantee Fund's (KCGF) coverage for five years. More than 30 percent of Korea Technology Finance Corporation's (KOTEC) guarantees went not to start-ups but to established companies older than three years.

[9] Lee et al. (2009) estimate that the share of total policy support to SMEs constitutes 30 percent of their funding, while bank loans (with or out without guarantees) account for 62 percent.

[10] Credit-specialized financial companies (CSFCs) consist of credit card companies, leasing companies, installment finance companies, and new technology-venture capital companies.

[11] For mutual saving banks, the requirement encompasses household loans as well.

17.   **The prospects of households are closely tied with SMEs, especially in the nontradable sector.** The distinction between households and "mom and pop" shops is blurred as 88 percent of companies operate as micro-enterprises.[12] SMEs dominate the services sector and depend on domestic consumption more than the large firms, tying closely investment in the sector with employment growth. This suggests that addressing SMEs weaknesses in the services sector would go a long way supporting household income growth and deleveraging.

SMEs, Employment and Domestic Demand
(y/y percent change)

Source: CEIC Data Company Ltd.

Legend:
- SME production index in manufacturing (LHS)
- Household consumption (LHS)
- Retail sales (LHS)
- Employment (RHS)

18.   **Cognizant of the need to rebalance growth toward the nontradable sector, the authorities launched a major initiative in May 2009 to develop services.** As part of its strategy to create new "engines of growth," the government identified 9 service sectors, including education, content provision, IT services, design consulting, medical services, employment support, logistics, and broadcasting and communications. However, the choice was based on their potential to reduce Korea's deficit in service trade and the sectors' value added, rather than addressing the broader problems in the SMEs and the services sector. The plan targets a more level playing field between services and manufacturing by increasing the tax incentives, fiscal aid, and SME support to the level of manufacturing. For example, knowledge-based services are being given more government credit guarantees and to increase the amount of SME assistance received in the service sector, the government greatly relaxed the requirements for service firms to be classified as SMEs.[13]

D.   Conclusions and Policy Recommendations

19.   **Rebalancing growth from exports to the nontradables with leveraged actors will require action on multiple fronts and a careful balancing act.** Delaying SME restructuring would undermine a sustained increase in investment and employment growth in the nontradable sector and feed the incentives for more leverage. Efforts to restructure SMEs should start with scaling back SME guarantees back to international norms, while resisting temptations to use industrial policy for the new engines of growth in the nontradable sector. At a minimum, the regulatory requirements to lend to SMEs should be gradually eliminated to encourage banks to assess risks and opportunities and improve the efficiency of capital

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[12] As a result, reported SME loans, which rely only on commercial bank data, appear to underestimate SME debt by about 30 percent while misclassification overstates household loans.

[13] OECD, *2010 Economic Review-Korea*.

allocation. This would include developing new instruments suitable for the SMEs in the services sector and reduce dependence on limited collateral, such as real assets.

20.   **Leveling the playing field between services and manufacturing would be crucial in rebalancing and sustaining growth.** However, this would be better achieved by reducing support to the latter, rather than, as planned, extending more government guarantees and payments to service firms, notably SMEs. Rather than service industry-specific measures, broader policies to strengthen competition in services by eliminating domestic entry barriers, accelerating regulatory reform, upgrading competition policy and reducing barriers to trade and inflows of foreign direct investment (FDI) would be needed to improve productivity in services.

21.   **Maintaining a robust consumption growth while avoiding an abrupt deleveraging of households will require a combination of policies to support incomes, ease transition costs, and further develop the financial sector to better intermediate the risks now born by households.** A carefully planned sequencing of labor market policies and increased social protection for unemployed would be crucial to minimize the adjustment costs until restructuring of the SMEs can unleash new sources of employment and income growth (Eskesen, 2010). Addressing the seniority system in the labor market, while increasing the coverage of and the contribution to the pension system would improve formal employment opportunities for the aging population and support household incomes. Developing mortgage financing further and addressing the structural problems in the housing sector would also go a long way in addressing the financial risks inappropriately born by the households who cannot diversify them.

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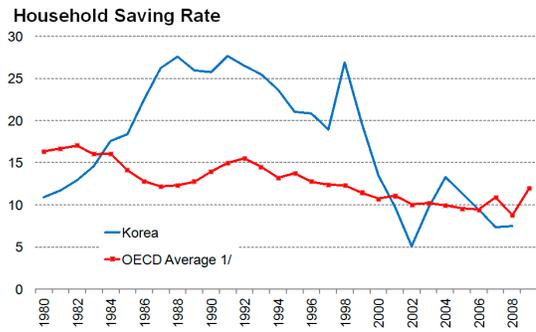Syed, M. ,2008, *What Determines Investment in Korea?,* IMF Staff Country Report No. 08/296 (Washington: International Monetary Fund). http://www.imf.org/external/pubs/cat/longres.cfm?sk=22349.0

II. Are Korean Households Saving Too Little?[1]

The combination of the declining saving rates and rising indebtedness of Korean households raises concerns that leveraged consumption growth cannot be sustained and could eventually lead to a vicious cycle of deleveraging, lower economic growth, and risks to financial stability . This paper sheds light on the factors behind declining household saving rate in Korea, utilizing cross-country panel data. The results point to rapid aging and labor market, and retirement system characteristics as fundamental factors driving the decline in the saving rate, while a prolonged period of cheap and easy credit, coupled with a deteriorating terms of trade appear to have magnified these trends. While demographic trends will continue pushing household savings lower, labor market and pension system reforms could help arrest the decline in saving rates. Increasing productivity in the nontradable sector would also help lift terms of trade and household incomes and facilitate deleveraging.
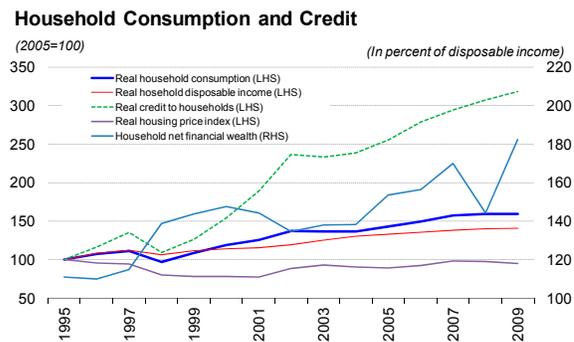
A. Introduction

1. **Korean households' savings rate dropped from 27 percent to 7½ percent of disposable household income since 1998 and remains one of the lowest in the OECD and in Asia.** This has coincided with a steady increase in household debt, which reached 143 percent of reported disposable income.[2] Furthermore, Koreans spend 7 percent of their income to service debt, more than U.S. households.

2. **The combination of declining saving rates and increasing household debt has raised concerns about sustainability of consumption and financial stability.** Higher debt and lower savings enabled household consumption to grow faster than disposable income, providing a boost to economic growth. In the long-run, however, consumption cannot grow faster than income because there is an upper limit to how much debt households can service, based on their

Household Saving Rate

Source: OECD.
1/ includes the OECD countries in the sample.

Household Consumption and Credit

Source: CEIC Data Company Ltd.

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[1] Prepared by Meral Karasulu. Janice Lee provided assistance with data.

[2] Survey data suggest that underreporting of household incomes may overstate the debt ratio by about 22 percentage points, consistent with the estimated size of the informal economy.

incomes. To achieve a sustainable level of debt relative to income, households may need to undergo a prolonged period of deleveraging, whereby debt is reduced and saving is increased. This paper sheds light to the factors behind the sharp decline in saving rate, understanding of which would be essential in devising policies that would help reverse the decline.

3.   The next section of the paper presents a cross-country panel regression and discusses the key factors behind the declining saving rate in Korea. The last section concludes with policy recommendations.

B. What Explains Korean Households' Declining Saving Rate?

4.   **The literature suggests four broad motives for household savings:** to provide resources for retirement and bequests, to finance large life-time expenditures (e.g., housing and education), to finance unexpected losses of income (precautionary savings) and to smooth consumption as incomes vary over time. These motives point to a large number of variables that can explain saving behavior over time and across countries.

5.   **A cross-country panel regression was used to explain the dynamics of the household saving rate in Korea (Table 1).**[3] In line with past empirical literature, the variables considered were public and corporate savings (both as a share of GDP) to capture Ricardian effects and households' ability to pierce the "corporate veil," the level of per capita GDP, real household disposable income growth (to capture the level of development), the old-age and young age-dependency ratios (to capture the impact of demographics), real interest rates (to capture the opportunity cost of current consumption), CPI inflation (to capture uncertainty about future income growth), the unemployment rate (to capture precautionary saving motive to insure consumption against adverse shocks to income), real stock prices (to capture wealth effects),[4] the share of household credit in GDP (to capture financial deepening), and the terms of trade and the effective retirement age. The terms of trade is intended to capture divergence between gross national income and output, as a fall in the relative value of exports corresponds to a fall in income which is not matched by a drop in consumption given the less-than-unit marginal propensity to consume and save and may lead to lower saving rates. Retirement tends to be the most important saving motive, making a change in pensions and expected length of the retirement period important demographic

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[3] An unbalanced panel regression comprising 20 countries was estimated using generalized method of moments (GMM) with country dummies and lagged values of the variables as instruments. The countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea, New Zealand, Netherlands, Norway, Sweden, Switzerland, United Kingdom and United States. The longest series in the unbalanced sample starts in 1970 and ends in 2008.

[4] Real house prices were also included, but were not statistically significant.

variables in saving decisions. Increases in the expected length of the retirement period, either through a higher life expectancy or through a decline in the mandatory retirement age, raise the need for more saving in younger ages, putting upward pressure on the aggregate savings. However, since cross-country data on these variables are not available, instead effective retirement age was used as a proxy.[5] This variable captures the decision of the retirees to stay in the labor force and hence takes into account their response to incentives embedded in the pension system. For instance, a higher effective retirement age could be associated with the decisions of retirees to stay in the labor force due to low replacement or low coverage rates of the pension system, which in turn could be associated with lower saving motives as it would reduce actual retirement periods.

Table 1. Determinants of Household Savings
(In percent of household disposable income)

	Coefficients	4/
GDP per capita 1/	0.000	[0.008]**
Old age dependency ratio 2/	-0.257	[0.010]**
Young age dependency ratio 2/	0.214	[0.033]**
Effective retirement age 3/	-0.534	[0.000]***
Terms-of-trade	0.052	[0.000]***
Real household disposable income growth	0.310	[0.000]***
Corporate saving/GDP	-0.472	[0.000]***
Public saving/GDP	-0.464	[0.000]***
Real interest rate	0.332	[0.001]***
Real stock prices	0.001	[0.003]***
Inflation rate	0.529	[0.000]***
Unemployment rate	0.177	[0.078]*
Household credit/GDP	-0.045	[0.000]***

1/ In thousands of U.S. dollars (ppp)
2/ The youth-dependency ratio is the ratio of the pre-working age population (age category 0 to 19 years) to the working-age population (aged 20 to 64). The elderly-dependency ratio is represented by the ratio of the population in the retirement phase (aged 65 and over) to the working-age population.
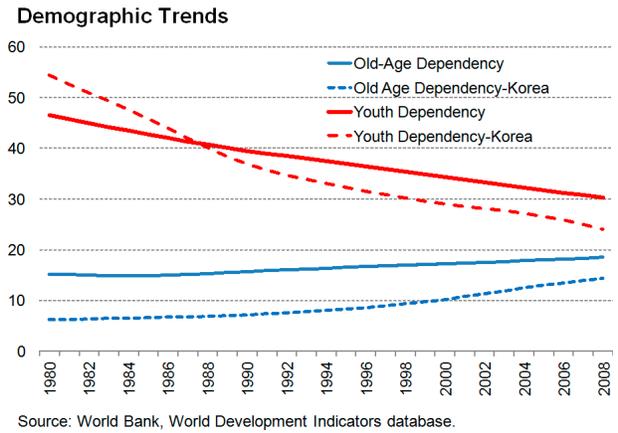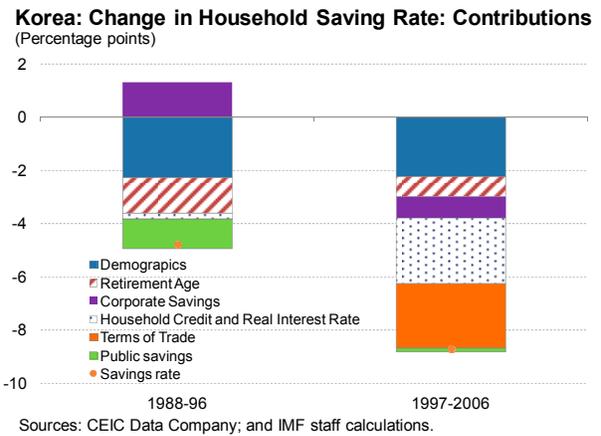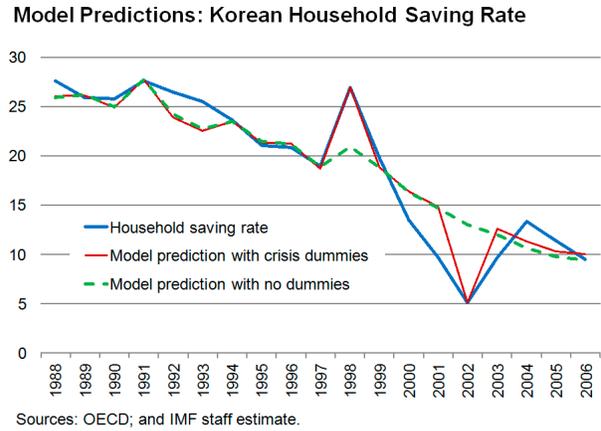3/ Source: OECD.
4/ Figures in parantheses are p-values. *, **,*** denote significance at 10, 5, and 1 percent, respectively.
5/ The model includes year dummies for Korea in 1998 and 2002.

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[5] The average effective retirement age is defined as the average age of exit from the labor force during a five-year period. Labor force (net) exits are estimated by taking the difference in the participation rate for each five-year age group (40 and over) at the beginning of the period and the rate for the corresponding age group aged 5 years older at the end of the period.
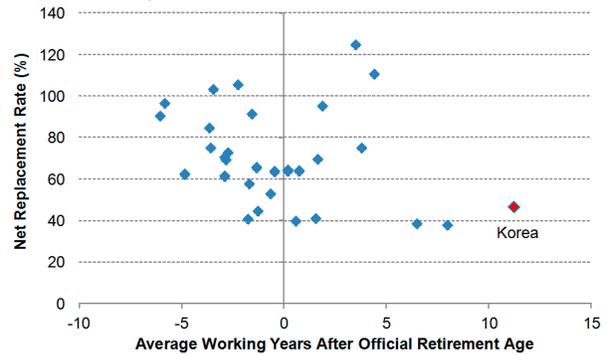
6. **Regression results suggest that the decline in the Korean households' saving rate is consistent with fundamentals.** Without even accounting for Korea specific factors, beyond those captured by the various regressors, the decline in Korean household savings rate can be reasonably predicted by the model. This suggests that rather than country specific factors, economic trends in Korea, consistent with other country experiences, tend to explain the declining trend in savings. Decomposing the estimates into their respective contribution to the household savings, few key conclusions emerge; demographic trends and retirement were the key structural factors behind the decline in the saving rate until the Asian crisis and they continue to contribute significantly to the negative trend since 1997. However, since the Asian crisis increased access to finance along with low interest rates and deteriorating terms of trade have been the main reasons behind the sharp fall in savings rates. Corporate deleveraging since the Asian crisis has also led to lower household savings, while Ricardian effects were more dominant prior to 1997 reflecting the larger increase in public savings during that period.

Model Predictions: Korean Household Saving Rate

Sources: OECD; and IMF staff estimate.

Korea: Change in Household Saving Rate: Contributions
(Percentage points)

Sources: CEIC Data Company; and IMF staff calculations.

• **Demographics.** An aging population would reduce household savings, a trend observed in most of the OECD countries. Similarly, a decline in the young-age dependency ratio would reduce the saving motives of the parents. Although the old-age dependency ratio in Korea is still below the OECD average, the fast drop in Korea's fertility rate led to a significant drop in the young-age dependency ratio and appears to stands out as a key reason for the declining saving rate. Going forward, with old-age dependency increasing rapidly with an aging population, the saving rate is likely to decline further.
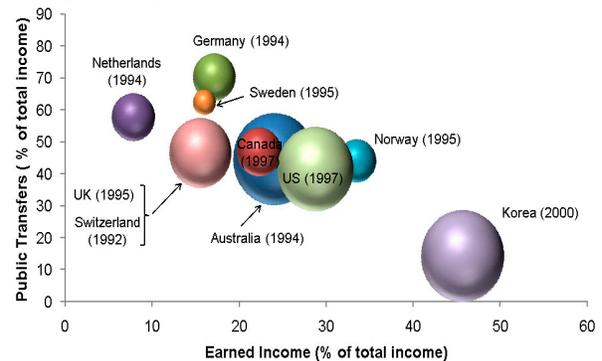
Demographic Trends

Source: World Bank, World Development Indicators database.

- **The introduction of the public pension system and the unique features of the labor market reduced incentives for saving by altering labor supply decisions.** The fully funded and mandatory pension system in Korea has one of the lowest replacement and contribution rates in the OECD.[6] Nonetheless, its introduction in 1988 was a break-through for households that relied only on personal savings until then for retirement income reducing incentives to save. On the other hand, the seniority system in the labor market translates into low mandatory company retirement age, well below the official retirement age, which in turn is already lower than the OECD average. As a result, high life expectancy pushes most retirees to second jobs, increasing the effective retirement age beyond the official retirement age. However, most post-retirement employment tends to concentrate in the services, where mom and pop shop proliferate with retirement lump-sums used for start-up capital, or in irregular employment with lower wages.[7] These features of the pension system and the labor market contribute to high old-age poverty rates and the higher indebtedness of older cohorts in Korea (see Karasulu, 2007).

Pension Replacement Rates and Effective Retirement Age, 2000-07
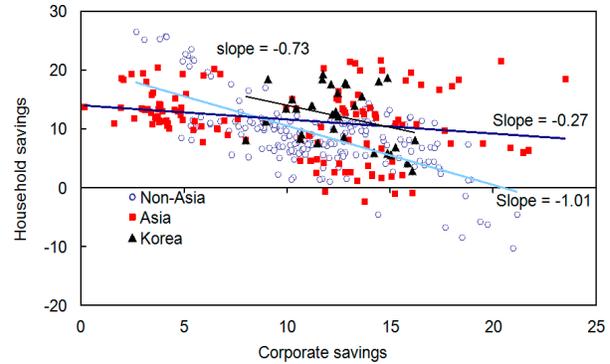
Source: OECD.

Old Age Poverty

Sources: Rein et al. (2004); and for Korea, Kim & Cho (2005).

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[6] Although the former helps raise the sustainability of the pension system and reduce the associated fiscal burden, it also affects labor supply and saving decisions by households.

[7] Reflecting the large number of self-employed and irregular workers, the Korean pension system has a low coverage (60 percent compared to around 85 percent for the OECD), although notional coverage was made universal in 1999.
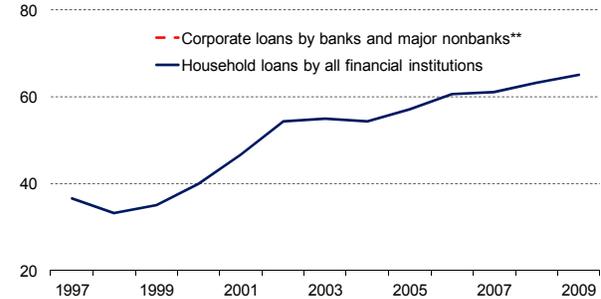
- **Corporate savings have substituted for some of the household savings.** Corporate and household savings are intimately connected through the household ownership of corporates. Absent any tax distortions and liquidity constraints, households should be indifferent between holding their savings directly or indirectly via the savings of the firms that they own. However, in the presence of credit constraints or a weak corporate management culture piercing, this corporate veil becomes difficult, breaking this neutrality. While for most of Asia this neutrality does not hold, in Korea, the deleveraging of the corporate sector following the Asian crisis along with substantial corporate governance reforms appears to have provided incentives to reduce savings for households.

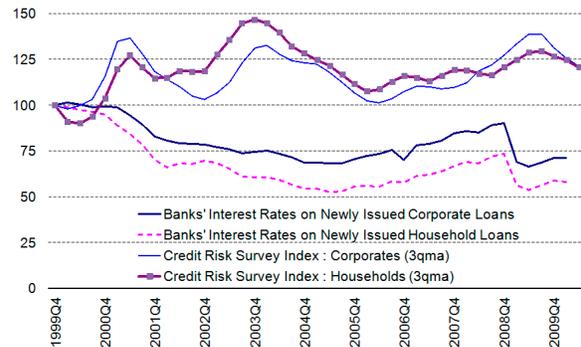**Household and Corporate Savings**
(In percent of GDP)

- **Low interest rates and competition for new market segments in the financial system after the Asian crisis fueled credit to the household sector and reduced incentives to save.** With less diversification of household balance sheets to financial assets, the low interest rate environment reduced incentives to save and increased household debt. Since 1998, credit to households has increased at an average annual rate of 13 percent, reaching about 70 percent of GDP at e nd-2009 from about 38 percent of GDP prior to the crisis. More than two-thirds of this increase can be attributed to lending by depository money banks. This coincides with retrenchment of credit from the large corporates following the financial crisis, when the banking sector increasingly shifted toward

Household* and Corporate Loans
(In percent of GDP)

Source: CEIC Data Company Ltd.
* Include general loans and loans for housing. ** Major nonbanks Include KDB(until 01), Merchant Banks, Trust account of banks, and life insurance companies

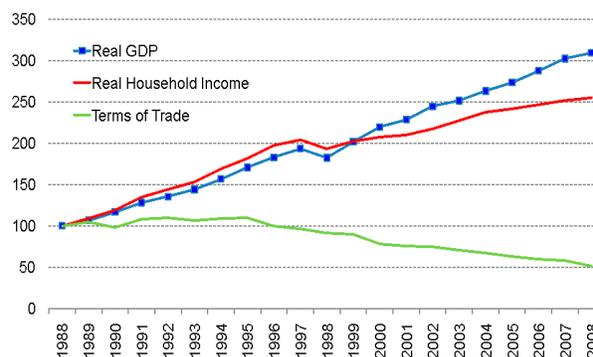**Interest Rates and Credit Risk**
(1999Q4=100)

Sources : BOK and CEIC Data Company Ltd.

retail lending and since 2000 through a rapid expansion of credit card use. The competition to lend to household sector also appears to have contributed to the rapid rise in household debt. Since 2000, lending rates to household sector declined faster than those charged to corporate sector, despite the expectations of higher risk from such lending.

- **A deteriorating terms of trade may have supported exports, but undermined real household income growth and reduced savings.** The price of a country's exports relative to its imports is important in the GDP deflator, particularly in an economy with a large trade sector, such as Korea. The deterioration of the terms of trade since 1998 has contributed to

Terms of Trade, GDP and Household Income (1988=100)

Sources: CEIC Data Company; and IMF staff calculations.

almost one-half lower increase in GDP deflator than the CPI or the deflator for private household consumption constraining real income growth and reducing savings in line with the Harberger-Laursen-Metzler effect.

C. Conclusions and Policy Recommendations

7. **The decline in the Korean household savings rate is driven by a combination of structural and cyclical factors.** While the rapidly aging population and the introduction of the pension system are the key structural reasons for the declining saving rate, the availability of cheap credit also contributed to this trend, especially at a time when real household income growth was constrained by a deteriorating terms of trade.

8. **Going forward demographic factors are likely to push the saving rate even lower**. One of the lowest fertility rates in the world and an increasing life-expectancy will translate into an extraordinarily large increase in the old-age dependency ratio from 14½ percent in 2008 to 65 percent in 2050. As a result, more people who are currently in the work force and are accumulating assets would reduce their saving in the medium term.

9. **However, cyclical factor should help support savings.** With the Great Moderation over, and tighter financial regulations expected to temper credit growth, a deleveraging of the household sector is likely. Considering the high share of borrowing at floating rates, the deleveraging could be rather rapid depending on the speed of interest rate normalization.

10. **Addressing the fundamental factors behind the fall in the saving rate would require wide-ranging structural policies.** Besides immigration and child- friendly policies to reduce long-term aging pressures, the design of the pension system as well as labor market

policies may need to be recalibrated. The 2008 pension reform 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, reflecting a social choice of low contribution and low benefits in Korea. However, the seniority system in the labor market coupled with low coverage and low benefits from the pension system are increasing the poverty risk of an aging population as working years do not provide sufficient accumulation of assets for the longer life expectancy. Reversing this trend would require eliminating the seniority wage system and increasing regular employment of old-age workers.

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III. LABOR MARKET DYNAMICS IN KOREA—THE ROLE OF INSTITUTIONS AND SHOCKS[1]

A. Introduction

1.   **The recent global financial crisis or "Great Recession" led to the deepest downturn in the global economy since World War II**. It particularly hit economies open to trade and integrated with the global financial system, including Korea. However, the global economy is now recovering and Korea is at the forefront of the rebound, having benefited from a strong policy response, the normalization of international trade, and the return of investor risk-appetite.

2.   **During the "Great Recession" and the ongoing recovery, labor market dynamics have differed widely across countries.** Some countries, such as the United States and Spain, have seen significant job losses and steeply rising unemployment rates, while others, including Korea, Japan, and Germany have experienced more muted dynamics for employment and unemployment. What explains this divergence in labor market dynamics?

3.   **This paper analyzes the determinants of labor market dynamics across a diverse set of advanced economies, including Korea, during recessions and recoveries** over the past 40 years. In particular, the paper focuses on the importance of institutional factors such as the degree of employment protection, the generosity of unemployment benefits, and the share of temporary workers. It also focuses on the role played by the "nature" of recessions in determining labor market dynamics. For example, what are the implications if a recession was caused by a financial crisis and/or the bursting of a housing-market bubble? Also, do pre-conditions such as soundness of corporate balance sheets matter? Further to this, the paper analyzes the role played by policies in Korea and other countries, focusing in particular on government employment programs during the "Great Recession."

4.   **Based on this analysis, the outlook for employment during Korea's ongoing recovery is assessed and some preliminary policy implications are drawn.** On the latter, the paper discusses the exit strategy from the employment support programs implemented by the Korean government during the crisis. Furthermore, it briefly discusses policy options to support employment growth and enhance labor market flexibility over the medium term, including the scope to reduce employment protection legislation, adjust the focus of training and education with future needs, and other steps to reduce the duality in the Korean labor market.

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[1] Prepared by Leif Lybecker Eskesen. This paper is expected to be published in the *Korea and World Economy Journal*.

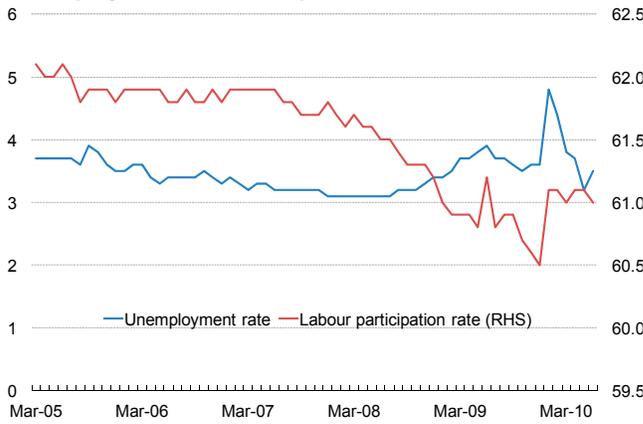### B. Labor Market Dynamics During the "Great Recession"

5.   **Korean labor markets did not escape the adverse spillovers from the recent global economic downturn, but the impact was cushioned by policy measures** (Figure 1).

- **Labor force.** Between June 2008 and December 2009, the labor force participation rate declined from 61½ percent (seasonally adjusted) to 60½ percent (seasonally adjusted), but then increased as workers re-entered the labor market to take up jobs offered under government work programs. The initial drop in the participation rate was most pronounced for women and workers with lower levels of education. They typically take up a larger share of temporary jobs and, in the latter case, lower skilled jobs and, therefore, are more likely to face layoffs and lack of job opportunities when a downturn hits. Among age-cohorts, the younger workers also left the labor market at a faster pace during the initial stages of the crisis. However, many of these more "vulnerable" groups have since returned to the labor market in conjunction with the introduction of the government work programs. However, the overall participation rate remains below pre-crisis levels, currently standing at 61 percent (seasonally adjusted).

- **Employment**. Employment losses from the downturn were particularly concentrated in financial services, manufacturing, and other cyclically sensitive sectors exposed to the adverse spillovers from the global crisis. However, the government's job creation program and other measures introduced in response to the crisis saw employment in public administration, education, and social services rise by close to 500,000 between June 2008 and August 2009, almost matching the decline in private employment during the same period. These measures, together with the high level of employment protection, helped sustain employment growth for regular workers throughout the crisis. The job-creation programs also helped support the employment of temporary workers, which declined significantly during the early stages of the crisis. On the other hand, the employment of daily workers and self-employed declined throughout the crisis. However, with the economic recovery gaining pace, job gains in the private sector have picked up in 2010 and are becoming more broad based.

- **Unemployment**. Notwithstanding the decline in labor force participation, measured unemployment also took a hit during the first year of the crisis, impacting in particular the younger cohorts during the early stages of the crisis. While the government job-creation programs helped cushion the fall in employment, a delayed implementation of the latter stage of the program led to a temporary spike in the unemployment rate to almost 5 percent in early 2010 because labor force participation rose as workers signed up for the program. However, the corresponding increase in
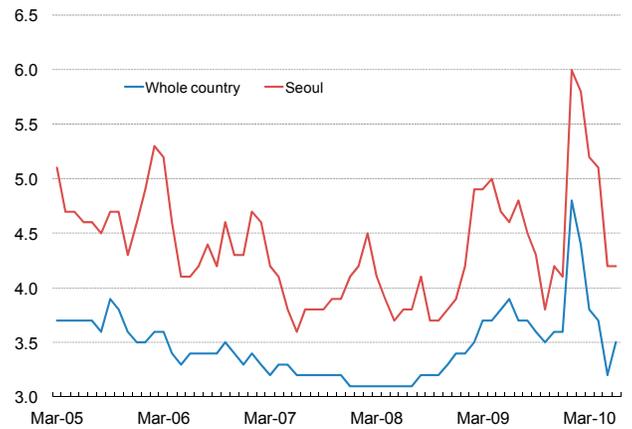
Figure 1. Korea—Labor Market Dynamics During the Crisis

Unemployment rose and labor force participation declined as the crisis unfolded...

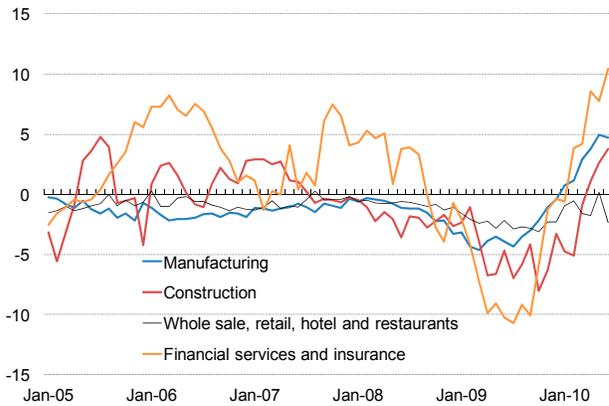**Unemployment and Participation Rate**

...and had a disproportionate impact on the Seoul area...

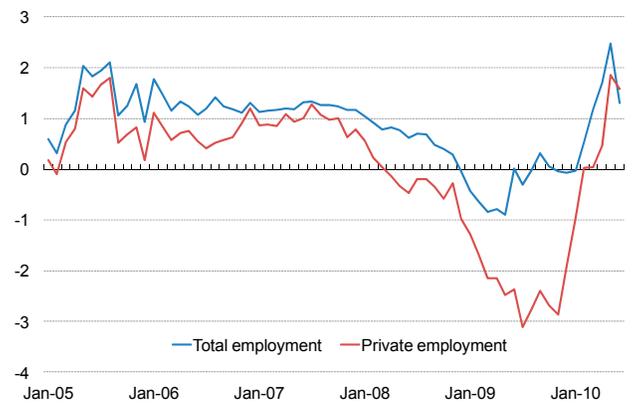**Unemployment Rate: Whole Country and Seoul**

...and the more cyclically sensitive sectors.

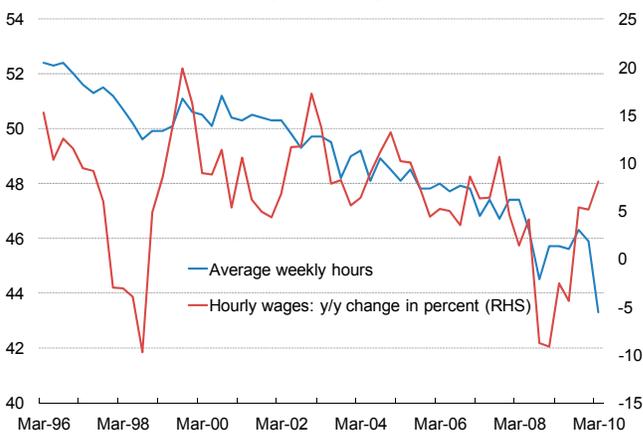**Employment by Sector**
(y/y percent change)

However, the government's work program helped cushion the decline in overall employment...

Employment Growth
(y/y percent change)

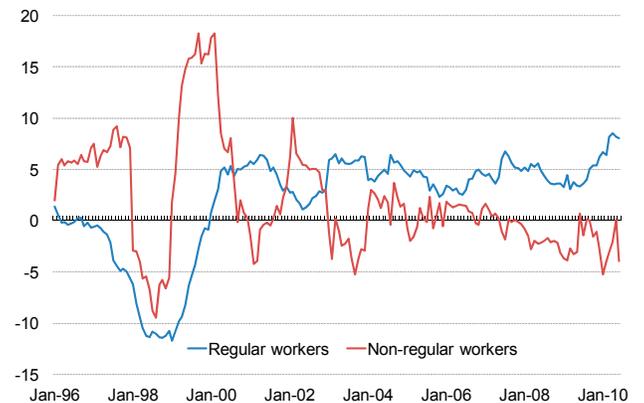*..., and high employment protection forced the adjustment to take place more through lower hours and wages...*

Weekly Hours and Changes in Wages

..., and to be carried in particular by the nonregular workers given their relatively lower firing costs.

Employment: Regular/Non-regular Workers
(y/y percent change)

public sector employment did not take place until a few months later, which then led the unemployment rate to fall back again and it has since continued to decline.
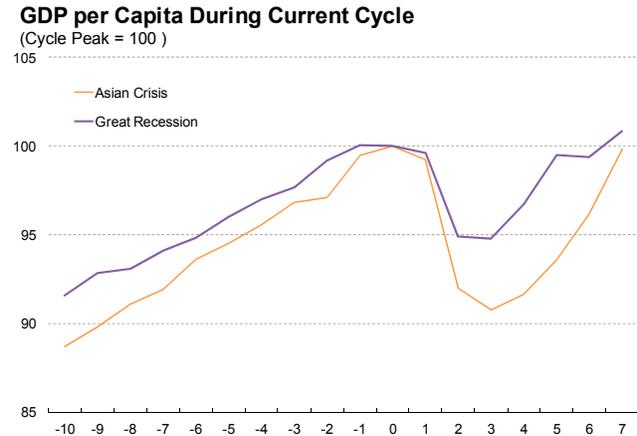
- **Hours and wages**. During the course of the crisis, the average work week declined by around 3 hours to 44 hours. Monthly wages also fell as hours worked and hourly wages were cut, declining on an annual basis between December 2008 and September 2009 for all industries. However, the growth rate has returned to positive territory over the past few quarters, although this primarily reflects a lengthening of the work week as hourly wages are still declining. The initial drop in average monthly wages was most pronounced for cyclically sensitive sectors such as manufacturing, construction, and financial services. By employment status, nonregular workers saw the largest declines in monthly pay.

6.   **Compared to the Asian Crisis, labor markets suffered less this time around (Figure 2).** During the Asian crisis in 1997–98, the employment rate bottomed out close to 10 percent below the cycle peak, while it during the current crisis only declined by 1½ percent relative to the peak level. Correspondingly, the unemployment rate rose significantly more during the Asian Crisis, up by almost 6 percentage points compared to around 1 percentage point this time around. The divergence between the dynamics during the Asian and the current crisis to a large extent reflects that the economic downturn was much deeper in the late 1990s, with GDP per capita dropping by close to 10 percent from peak to trough. During the Great Recession, on the other hand, GDP per capita only fell by around 5 percent from peak to trough, supported by the proactive policy response and the much sounder fundamentals of the Korean economy this time around (i.e., stronger balance sheet positions of the government, financial institutions, and large corporates), making it more resilient to the adverse global spillovers. Moreover, wages and hours worked also adjusted more during the current crisis, cushioning the impact on employment.
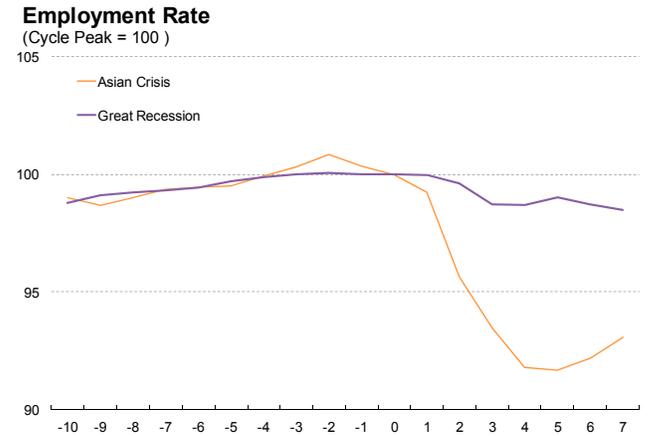
7.   **Korean labor market dynamics diverged from those seen in other advanced economies during the current crisis (Figure 3).** For example, the employment rate fell by 4 percent less than in the United States and the unemployment rate rose by around than 3½ percentage points less. This partly reflects that Korea's economy has rebounded faster than the U.S. economy, employment protection is higher in Korea, and hours, wages, and participation rates fell more, cushioning the impact on employment and (measured) unemployment. These were also broadly the reasons why Korean labor markets were less adverse impacted than in countries such as Ireland, Spain, and the United Kingdom. However, employment conditions weakened relatively more in Korea than in Germany. This likely owes much to Germany's higher level of employment protection and the German government's massive expansion of a short-term work program. At the same time, the decline in the employment rate and increase in unemployment since the business cycle peak was broadly in line with the trend seen in Japan.

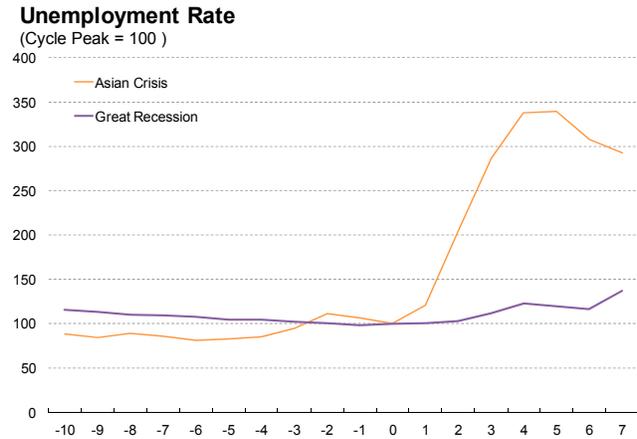# Figure 2. Korea—Comparing the Asian Crisis and the "Great Recession"
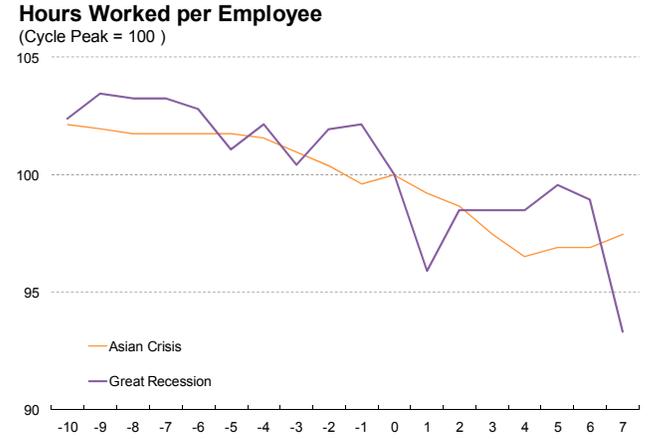
GDP declined by less during the "Great Recession"...

GDP per Capita During Current Cycle
(Cycle Peak = 100)

...and this was reflected in a softer employment impact...

Employment Rate
(Cycle Peak = 100)

....and a smaller increase in unemployment.

Unemployment Rate
(Cycle Peak = 100)

However, the job losses may also have been cushioned by an initial larger decline in hours worked...

Hours Worked per Employee
(Cycle Peak = 100)

...and hourly earnings...

Hourly Earnings in Manufacturing
(Cycle Peak = 100)

..., which declined by close to 10 percent y/y during the first two quarters of the recession.

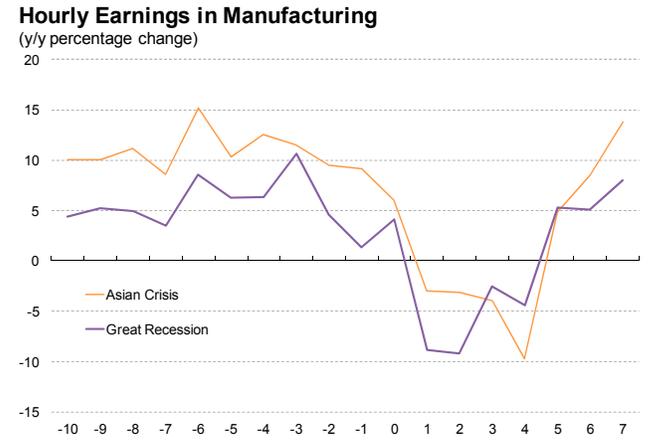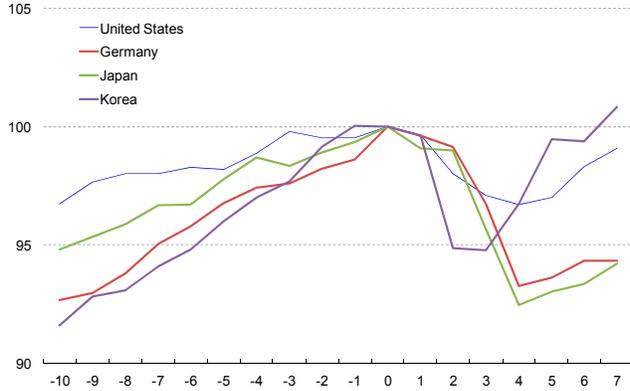**Hourly Earnings in Manufacturing**
(y/y percentage change)

Figure 3. Korea—Comparing Korea to Other Countries

Output in Korea declined much faster than in the comparator countries, but also recovered sooner.
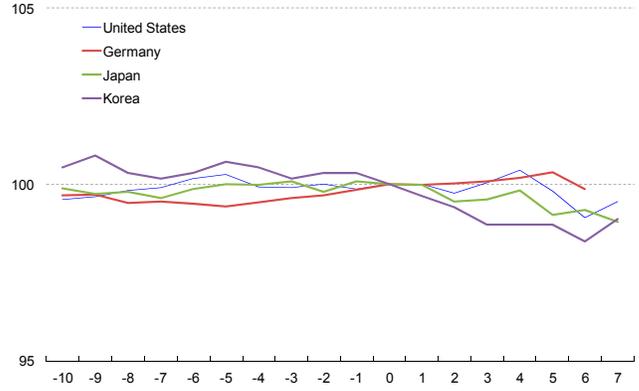
GDP per Capita During Current Cycle
(Cycle Peak = 100)

The decline in the labor force participation rate would appear to have been larger in Korea…

Labor Force Participation Rate
(Cycle Peak = 100)

...while the decline in employment …

Employment Rate
(Cycle Peak = 100)

...and the rise in the unemployment rate was less dramatic and in line with trends seen for Japan.

Unemployment Rate
(Cycle Peak=100)

However, the adjustment in hours worked...

Hours Worked per Employee
(Cycle Peak = 100)

….and wages was larger in Korea, especially early on during the crisis.

Change in Hourly Wages
(Pecentage change y/y)

C. What Explains Labor Market Dynamics Across Countries?

8.   **As the previous section highlighted, the labor market dynamics during the "Great Recession" differed across advanced economies.** While this partly reflected differe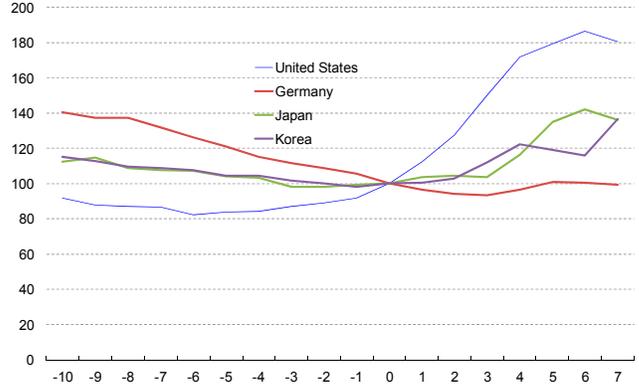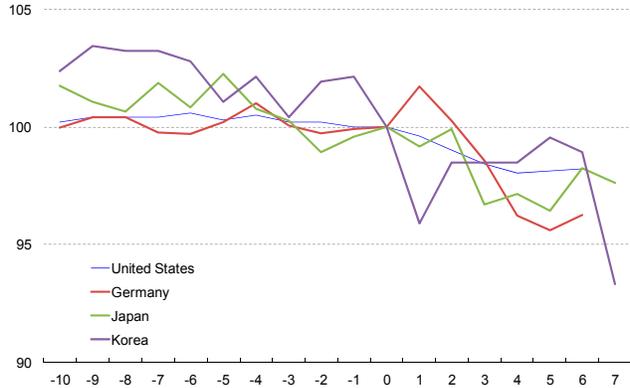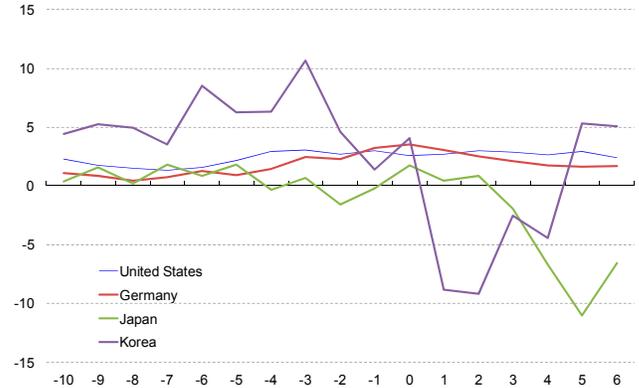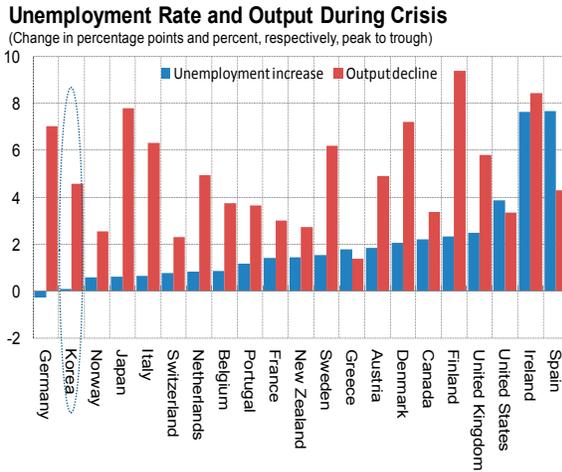nces in output losses, it would appear that institutional factors were also at play. Moreover, the nature of the shock differed across countries, with some countries hit by a multitude of shocks (financial crisis, the bursting of asset bubbles, and trade shocks) and others, including Korea, primarily hit through the trade channel. In addition, policy responses varied in terms of both magnitude and type of measures.

Unemployment Rate and Output During Crisis
(Change in percentage points and percent, respectively, peak to trough)

9.   **To analyze the respective roles of institutions and the nature of shocks, the papers applies Okun's law as an organizing framework.**[2] Okun's law captures the relationship between unemployment and output and can be expressed as follows:

$$\Delta u = \alpha - \beta \Delta y,$$

where Δu is the change in the unemployment rate, α is the intercept coefficient, and β is the elasticity of the unemployment rate with respect to changes in output. Based on the estimation of this simple equation for a diverse set of advanced economies and using a panel regression setting, the paper will assess (i) which institutional factors could explain the difference in unemployment responsiveness to output changes and (ii) to what extent the "nature" of shocks has a bearing on labor market dynamics during recessions and recoveries (proxied by the forecast errors of the estimated Okun's law). Finally, we will assess the impact of some of the employment programs implemented in a number of countries.

The role played by institutional factors

10.   **To determine the responsiveness of unemployment to output changes, a dynamic version of Okun's law is estimated for 21 advanced economies, including Korea.**[3] [4] For

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[2] The paper follows the methodology used in Chapter 3 of the April 2010 IMF *World Economic Outlook*, which was authored by Ravi Balakrishnan, Mitali Das, and Prakash Kannan.

[3] The dynamic β captures the long-term impact of changes in output on changes in the unemployment rate, which essentially corresponds to the impact of lagged changes in unemployment and output on current changes in unemployment.

each country, the dynamic version is estimated for the 20 years prior to each recession that the country has gone through based on quarterly data. Given that all countries have experienced at least one recession over the past 50 years, the estimated equations gives us a set of dynamic βs across countries and over time. The results show that the responsiveness of unemployment to changes in output has been higher in the years preceding the current crisis than it was in the 1990s. Moreover, the estimated coefficients for the dynamic βs reveal large cross country differences, with
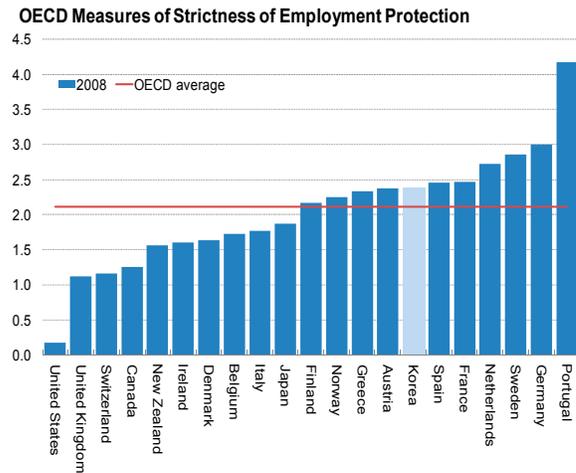
Dynamic Betas for 20 Years Prior to Great Recesssion
(Responsiveness of unemployment w.r.t output)

responsiveness very high in countries like Canada and Spain, while it is low for countries like Norway and Japan. For Korea, the dynamic β is estimated to be at the low end when controlling for crisis periods by using a crisis dummy in the Okun's law regression.

11. **A panel regression is estimated to gauge the role played by institutional factors, over time and across countries,.** In the panel regression, the dynamic βs are regressed on a set of institutional factors[5] (see Table 1, equation 1 to 5):

OECD Measures of Strictness of Employment Protection

- **Employment protection.** As expected, the panel regression shows that stricter employment protection makes unemployment less elastic to changes in output. This is because the higher costs of firing and hiring makes the employer more reluctant to both lay off workers during downturns and hire them during upturns. In Korea's case, employment protection is relatively high by OECD standards despite a decline over the past few decades, which helps explain the relatively low dynamic β for Korea.

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[4] The countries included are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States.

[5] As a measure of employment protection, OECD's employment protection legislation (EPL) index is used and the generosity of unemployment benefits measures the income replacement rates.
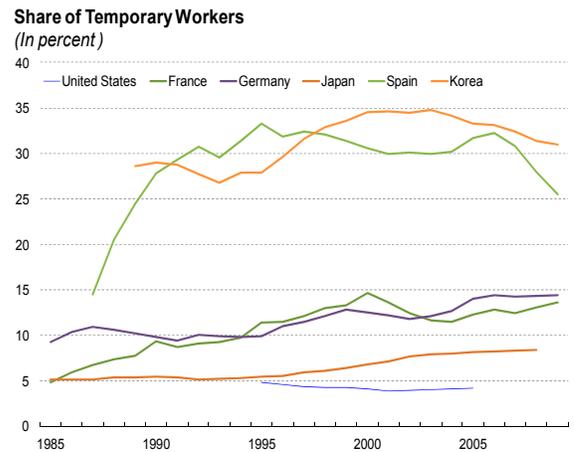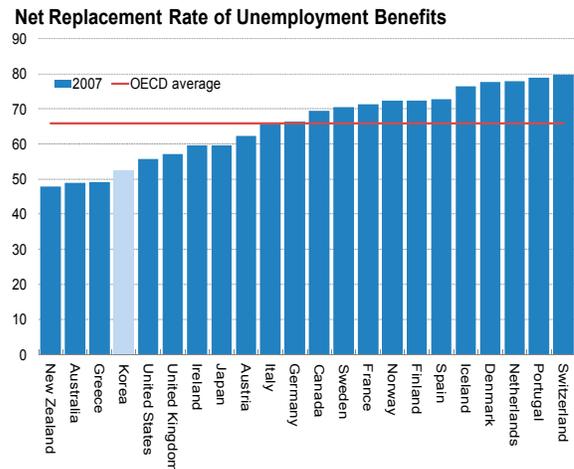
Table 1. Determinants of Unemployment and Employment Responsiveness to Changes in Output

	Unemployment Equation					Employment Equation
	(1)	(2)	(3)	(4)	(5)	
Strictness of employment protection	-0.05 [0.050]			-0.08 [0.007]	-0.07 [0.007]	-0.13 [0.03]
Generosity of unemployment benefits		0.14 [0.193]		0.37 [0.001]	0.40 [0.000]	0.44 [0.003]
Share of temporary workers			0.005 [0.148]		0.005 [0.334]	0.01 [0.134]
Constant	0.41 [0.000]	0.36 [0.000]	0.23 [0.000]	0.64 [0.000]	0.59 [0.000]	0.72 [0.00]
Number of observations	70	66	59	48	39	34
R^2	0.06	0.02	0.04	0.27	0.49	0.33

Source: IMF staff estimates.
Notes: P-values are presented in square brackets.

- **Generosity of unemployment benefits.** Theoretically the impact of more generous benefits is ambiguous. During downturns, generous benefits can limit downward wage flexibility and cause more job losses, while they may constrain employment growth during upturns by keeping reservation wages relatively high. The panel regression shows that the former would appear to dominate the latter. Given the relatively low income replacement rates in Korea, unemployment benefits would tend to mute unemployment dynamics compared to other countries.

- **Share of temporary workers.** A priori, a larger share of temporary workers should be associated with larger swings in unemployment during economic cycles due to the lower degree of employment protection for workers with temporary contracts and less sunk investment in them by employers. Moreover, the increased

Net Replacement Rate of Unemployment Benefits

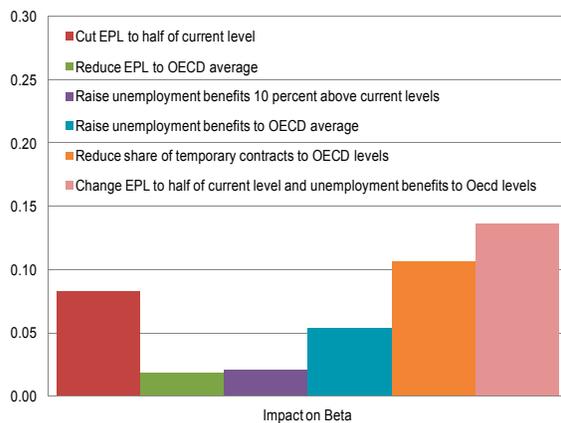**Share of Temporary Workers**
(In percent)

prevalence of this over time could have augmented this for Korea, which has a very high share by OECD standards. However, while the coefficient has the expected sign, it is not significant in any of the panel regressions.
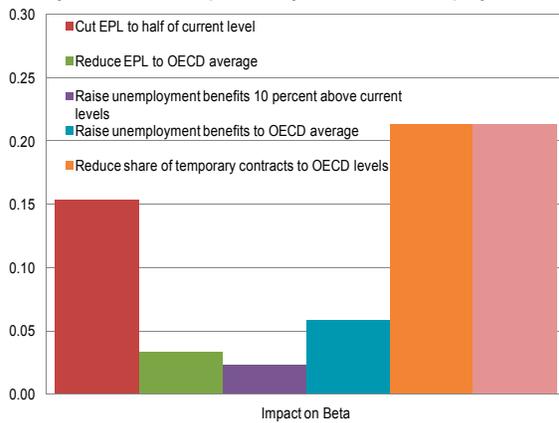
A panel regression looking at the determinants of the responsiveness of employment produces broadly the same results (Table 1).

12.   **Simulations show that institutional reform in Korea could have a significant impact on the responsiveness of employment and unemployment to economic activity.** Reducing the strictness of employment protection legislation (equivalent to half the current level of Korea's current EPL index) would increase the elasticity of unemployment and employment (with respect to output) from -0.21 to -0.29 and 0.41 to 0.56, respectively, an increase of close to 40 percent. Aligning Korea's unemployment benefits and share of part-time workers with the OECD average would also raise elasticity noticeably. A combination of lowering employment protection (cut in half), while raising unemployment insurance (to OECD levels), would increase elasticities of unemployment and employment by more than 50 percent.

The role played by the nature of the recession

13.   **Each recession is different and has different implications for the depth of the labor market shock and the speed of recovery in employment.** While this clearly depends on the size of the economic downturn, the nature of the shock hitting the economy can also have an impact on the labor market dynamics during the recession and recovery phases.

14.   **To analyze the role played by the nature of recessions, a two-stage approach is applied.** First, we compare the actual change in unemployment during previous recessions and recoveries for each country to the changes predicted by the estimated Okun law

relationships. Second, these forecast errors, controlled for output changes, are then regressed on different shock types associated with previous recessions using a panel data setting (Tables 2 and 3): [6]

Table 2. Unemployment Dynamics During Recessions Not Explained by Changes in Output

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Financial crisis	0.73 [0.000]						
Financial stress		0.21 [0.045]	-0.59 [0.019]			0.26 [0.019]	0.20 [0.085]
Financial stress X corporate leverage			0.03 [0.003]				
Bursting of housing bubble				0.09 [0.000]		0.08 [0.000]***	0.07 [0.002]
Stock return dispersion					0.52 [0.078]		1.09 [0.007]
Constant	0.21 [0.032]	0.12 [0.346]	0.04 [0.735]	0.06 [0.658]	0.29 [0.007]	-0.17 [0.241]	-0.28 [0.059]
Number of observations	352	259	156	314	334	235	234
R^2	0.04	0.02	0.06	0.05	0.01	0.09	0.11

Source: IMF staff estimates.
Notes: P-values are presented in square brackets.

Table 3. Unemployment Dynamics During Recoveries Not Explained by Changes in Output

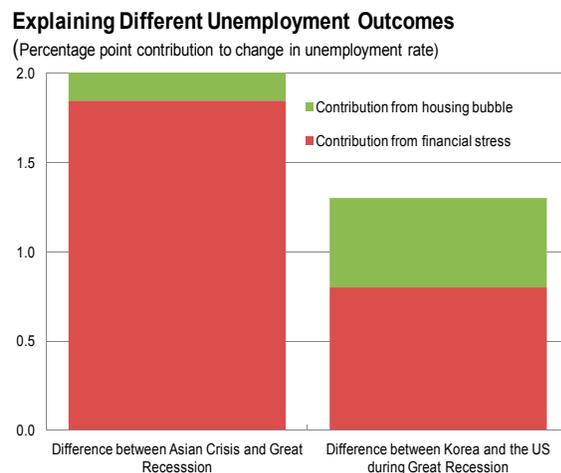|	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Financial crisis	0.20 [0.097]						
Financial stress		0.11 [0.047]	0.29 [0.102]			0.11 [0.056]	0.11 [0.097]
Financial stress and corporate leverage			0.0 [0.188]				
Bursting of housing bubble				-0.01 [0.384]		-0.02 [0.144]	-0.02 [0.173]
Stock return dispersion					0.03 [0.822]		0.04 [0.842]
Constant	-0.18 [0.000]	-0.10 [0.041]	-0.07 [0.268]	-0.12 [0.077]	-0.15 [0.005]	-0.05 [0.531]	-0.06 [0.474]
Number of observations	520	389	279	462	467	373	365
R^2	0.01	0.01	0.01	0.00	0.00	0.01	0.01

Source: IMF staff estimates.
Notes: P-values are presented in square brackets.

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[6] This again follows the approach used in Chapter 3 of the April 2010 IMF *World Economic Outlook.*

- **Financial shocks.** Historical evidence points to the protracted nature of recessions and recoveries following financial shocks. Using a financial crisis dummy with a value of 1 during recessions and recoveries accompanied by financial crisis, shows that financial shocks have implications for labor market dynamics. According to the panel regression results, the unemployment rate would be around 0.7 percentage points higher during recessions associated with financial shocks and about 0.2 percentage points higher during recoveries. Other measures of financial shocks, including a financial stress index, also suggest that unemployment will be higher during down-cycles associated with high financial distress, especially if there are also balance sheet vulnerabilities such as high corporate leverage.[7]

- **Sectoral shocks.** A sectoral shock could be the bursting of a housing market bubble, which would primarily have a direct impact on the construction sector. However, it is also likely to have broader implications for households through wealth effects and the financial sector through solvency effects. A panel regression shows that a dummy variable with the value 1 during crisis accompanied by the initial bursting of a housing bubble can help explain a higher level of unemployment during the recession phase but not during the recovery phase. Another measure of sectoral shocks could be the dispersion in stock market returns across economic sectors, with a high level of dispersion indicating prevalence of sector-specific shocks. Including this measure in the regression confirms that sectoral shocks do tend to amplify the unemployment shock during recessions, but during recoveries, the coefficient on dispersion is not significant.

15. **These results also help explain why Korea was less hit this time around than during the Asian crisis and why Korea fared relatively better compared with other countries.** During the Asian crisis, unlike this time around, the economy was hit by a dual financial and housing market shock. Moreover, the corporate sector was highly leveraged then, while at least the large corporates entered the recent crisis with strong balance sheets. Factoring in the relatively higher level of financial stress during the Asian crisis and the bursting of the housing market bubble can alone explain close to 2 percentage

Explaining Different Unemployment Outcomes
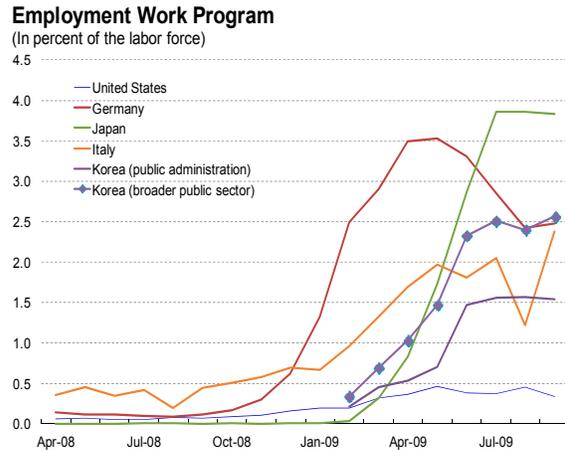(Percentage point contribution to change in unemployment rate)

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[7] The financial stress index used here was developed by Cardarelli, Elekdag, and Lall. See for example, *Journal of Financial Stability*, 2010 (forthcoming).
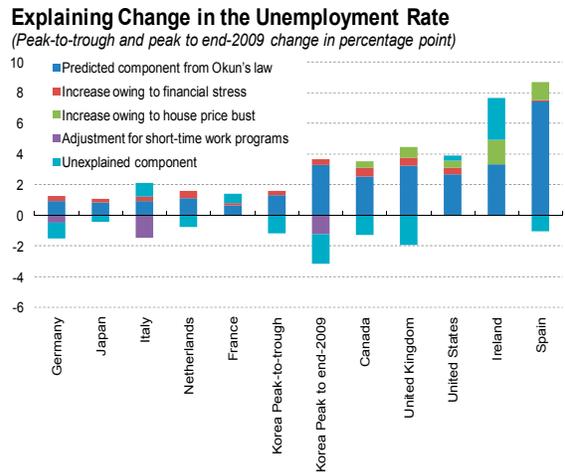
points (or most) of the difference in the change in the unemployment rate during the recession phases of the two crisis. During the current crisis, Korea, unlike the United States, did not face a banking crisis and a housing market collapse. In addition to the relatively lower responsiveness of unemployment to changes in output in Korea's case, this can explain around 0.75 percentage points of the difference between the change in the United States and Korean unemployment rates during the "Great Recession".

The role played by government employment programs

16.   **During the recent downturn, a number of advanced economies introduced short-term work programs to cushion the impact from the economic slowdown on employment**. Countries making use of these programs included France, Germany, Italy, Japan, Korea, and the United States. There was a significant expansion in these programs early on in the crisis in both Germany and Japan, which saw the intake soar to 3½ and close to 4 percent of the labor force, respectively. In the United States and Italy, the increase was less pronounced, which partly reflected design features making it less attractive for employers to use the programs and for workers to participate. In Korea's case, the government in the 2009 original and supplementary budget introduced various measures to support employment, both through subsidies and temporary public work programs. Aggregating employment in public administration, education, health, and social services, the increase in public employment during the first three quarters of 2009 accounted for close to 2½ percent of the labor force.

Employment Work Program
(In percent of the labor force)

17.   **These programs can, therefore, also help explain the "unpredicted" change in unemployment during the crisis.** The economic slowdown, rising financial stress, and the housing markets busts (in some of the countries) can help explain a significant portion of the increase in actual unemployment from peak to trough during the recent downturn. However, in some countries, including Korea, Germany, and Italy, the predicted change in the unemployment rate by Okun's law exceeds

Explaining Change in the Unemployment Rate
(Peak-to-trough and peak to end-2009 change in percentage point)

the actual change and the expansion in the job programs in the latter two countries can explain some of this. In Korea's case, the public job expansion did not start until after the trough of the crisis in end-2008 and, therefore, only help explain the forecast errors during 2009.
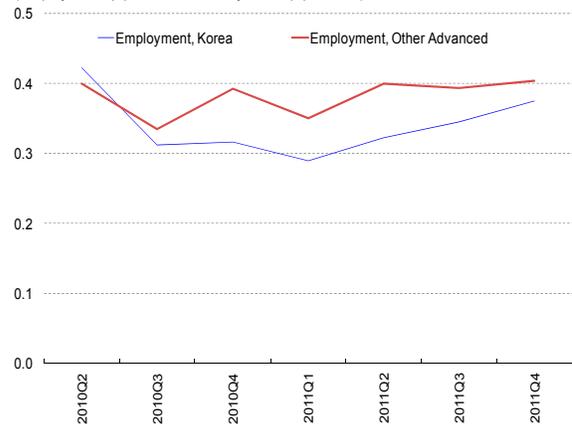
D. What do the Empirical Results Suggest for the Employment Outlook?

18. **Employment is likely to pick up with the rebound in the Korean and global economy, although the recovery may prove protracted.** Korea's economy has rebounded impressively since the recession in the second half of 2008 and is at the front line of the global recovery. This has already been reflected in an improvement in labor market conditions, including a pickup in employment across sectors and professions. However, the economic growth momentum is expected to slow in coming quarters, partly as a "technical payback" for the fast recovery and as macroeconomic stimulus is scaled back.

19. **Even so, employment in Korea is predicted to grow faster than in most other advanced economies, but this also reflects faster growth**. Scaling the employment growth predicted by the estimated Okun laws with expected GDP growth, shows that the employment gains are less buoyant in Korea. This is in line with the estimated lower dynamic beta in Korea's employment equation. However, these predictions do not factor in that employers may be somewhat cautious about hiring due to lingering uncertainty about the economic outlook. Also, they do not factor in the potential impact from a gradual scale back in public employment programs in Korea and other advanced economies.

Model Predicted Employment Recoveries
(Employment q/q SAAR divided by GDP q/q SAAR)

20. **Absent some of the labor market rigidities caused by institutional factors, employment could have recovered faster.** If Korea's employment protection level had been lower and unemployment benefits had been higher, employment would have declined more during the crisis, but would also have picked up much faster during the recovery. Comparing the through-cycle prediction of employment growth using the dynamic beta estimated for Korea with the

Model-Predicted Employment
(Growth q/q SAAR (LHS) and cumulative change in persons (RHS))

employment growth predicted if employment protection had been half its current level and unemployment benefits in line with OECD levels (resulting in a higher beta), suggests that the overall employment level would end up much higher in the latter case. In addition, panel regressions show that annual employment growth in Korea (and other countries), controlling for output growth, could have been 0.15 percentage points higher in the past for each 1 point decline in OECD's employment protection index and 0.36 percentage point higher for each percentage point increase in the income replacement rate of unemployment benefits. For Korea, this corresponds to additional employment of 350,000 and 850,000, respectively, over a 10 year period. However, the positive coefficient on the income replacement ratio should be interpreted with caution. It may simply pick up the fact that some countries with high income replacement ratios have institutional features supporting labor market flexibility, including a low level of employment protection, decentralized wage-setting, etc. Indeed, if both employment protection and unemployment benefits are included as explanatory variables for employment growth, they turn out to be insignificant.

E.   Concluding Remarks

21.   **Korea's economy and labor markets were hit by the "Great Recession," but the job losses were lower than in the past and elsewhere.** When the adverse spillovers from the global economic and financial crisis hit the economy during the second half of 2008, employment declined, especially in the more cyclically sensitive sectors and for non-regular workers. However, the job losses were smaller than during the Asian crisis, which partly reflected the smaller output loss but also a larger adjustment this time around in wages and hours worked. The latter also partly explains why job losses were less severe in Korea than in many other countries during the "Great Recession."

22.   **Institutional factors also explain the small increase in Korean unemployment during the recent crisis compared to trends in other countries.** Korea's unemployment rate rose by a mere 0.1 percentage point between the pre-crisis cyclical peak in June 2008 and the trough of the crisis in December 2008. In fact, regression analysis reveals that the responsiveness of unemployment to output changes is relatively low in Korea compared to elsewhere, especially when controlling for crisis episodes. Based on a cross-country panel regression using advanced economies, it is found that the low responsiveness in Korea can partly be explained by the high level of employment protection, which is particularly high for regular workers. It also partly relates to the relatively low level of unemployment benefits in Korea. Further to these institutional factors, Korea's labor markets fared relatively well because the economy entered the crisis with sound fundamentals and was not, unlike other countries, hit by both banking crisis and the bursting of housing market bubbles. Moreover, the Korea government took decisive steps to counter the adverse fallout from the crisis through macroeconomic stimulus and an expansion of employment programs.

23.   **To avoid a "job-light" recovery, the authorities should manage the unwinding of policy support measures carefully and take further steps to increase labor market**

flexibility. While the rebound in economic activity in Korea has been impressive so far, macroeconomic and labor market policies have played an important part. These will, therefore, have to be scaled back carefully to safeguard the recovery in the labor market, although it will be important to ensure that the work programs do not become permanent features and restrain private-led employment growth. In this context, it will also be important to step up efforts to reduce the high level of employment protection for regular workers. While it reduces the decline in employment during a crisis, panel regressions suggests that it also slows the subsequent recovery and, more generally, has a negative impact on employment growth. Furthermore, the high level of employment protection has served to amplify dualism in the labor market, which leaves the nonregular workers more exposed during downturns, raising precautionary savings given the limited access to unemployment benefits. It also gives employers less incentives to invest in on-the-job training for the large share of non-regular workers (more than one-third), with likely negative implications for potential growth. Reducing employment protection, especially for regular workers, should go hand in hand with an enhancement in social protection programs to help lessen the income losses during unemployment and smooth consumption. Moreover, to help give nonregular workers a foothold, further efforts are likely needed to strengthen their training and education.

APPENDIX

The description of data sources methodology in this appendix borrows from Chapter 3 of the IMF *World Economic Outlook*, April 2010.

Data sources

Data Sources

Descriptor	Source
Employment	OECD, [1] Labor Force Statistics
Labor Force	OECD, Labor Force Statistics
Unemployment Rate	OECD, Labor Force Statistics; Haver Analytics
Read GDP	GDS (raw data from Haver Analytics) and CEIC for Korea
Employment Protection Legislation	OECD
Unemployment Benefits (average replacement ratio for first two years)	IMF Structural Reform Database
Share of Temporary Workers	Eurostat, OECD
Hours per Employee	Haver Analytics, National Sources
Sectoral Stock Market Returns	Datastream

[1]OECD = Organization for Economic Cooperation and Development.

Business cycles

This paper employs a "classical" approach to dating business cycles by focusing on turning points in the level of output rather than deviations from a trend. The procedure—based on Harding and Pagan (2002)—uses a set of statistical criteria to determine the window over which an observation is classified as a local peak or trough and to determine the minimum duration of a complete cycle and the minimum duration of a phase of a business cycle. In this chapter, the observation window is set at two quarters, the minimum duration at five quarters, and the minimum phase at two quarters. Although the criteria for the minimum duration of a cycle and a phase are occasionally binding, the procedure generally dates the start of a recession as the quarter during which output is higher than the two quarters preceding and following it. This implies that a period of two quarters of negative growth is a sufficient, but not necessary, condition for a recession. Likewise, the end of a recession is generally marked as the quarter during which output is lower than the two quarters before and after it. With these criteria in place, local peaks and troughs are identified, which define recessionary and expansionary phases of the business cycle.

Stock market dispersion

Measure of Stock Market Dispersion The measure of dispersion in stock market returns follows Loungani, Rush, and Tave (1990). Stock market returns at the sectoral level for each country are obtained from Datastream. The data generally begin in the early to mid-1970s. For each country i, the time series of the stock market dispersion measure (SD_t) is computed as follows:

$$SDit = \left[\sum_{N=1}^{N} \omega_{nt}(R_{nt} - \bar{R}_t)^2\right]^{½}$$

where ω_{nt} is the share of total market capitalization of sector n in quarter t, R_{nt} is the quarterly return on the sector n index, and $\bar{R}_t$ is the total market quarterly return. To minimize large fluctuations in sectoral weights, the average share of market capitalization over the previous 10 years was used.

Okun's law and dynamic beta

For each recession episode in a particular country, a dynamic version of Okun's law is estimated using quarterly data for the 20-year period leading up to the peak in output just before the start of the recession. The general form of the equation that is estimated is as follows:

$$\Delta u_t = \alpha + \sum_{i=0}^{p_1} \beta_i \Delta y_{t-i} + \sum_{i=1}^{q} \gamma_i \Delta u_{t-i} + \sum_{i=0}^{p_2} \delta_i \times D^R \Delta y_{t-i} + \varepsilon_t,$$

where Δu and Δy refer, respectively, to the change in the unemployment rate and the level of output growth. D^R is a dummy variable that takes on a value of 1 if the economy is in a state of recession. The use of the dummy variable allows the coefficients related to the responsiveness of changes in the unemployment rate to output growth to take on different magnitudes depending on the state of the business cycle. To allow for different dynamics across countries, the lag lengths ($p_1, p_2 and q$ in the specification above) are chosen using a Bayesian information criterion for each country and each episode. For most countries and episodes, the criterion suggests the use of fewer than two lags. The procedure used to estimate the Okun's law equation for changes in employment is carried out in a similar manner, with the change in log employment as the dependent variable.

To demonstrate how the dynamic beta (β) is derived, we use the example of one lag on output and unemployment. This gives the following expression for Okun's law:

$$\Delta u_t = \alpha + \beta_0 \Delta y_t + \beta_1 \Delta y_{t-1} + \gamma_1 \Delta u_{t-1} + \varepsilon_t,$$

The dynamic beta (*DB*) measures the long-term impact of a one-unit change in output growth on the change in unemployment. Based on the specification above, the dynamic beta can be written as follows:

$$DB = \sum_{s=0}^{\infty} \Delta u_{t+s}$$

$$= \sum_{s=0}^{\infty} [\beta_0 \Delta y_{t+s} + \beta_1 \Delta y_{t+s-1} \, \gamma_1 \Delta u_{t+s-1}]$$

When there is a one-unit change to output growth during period *t* and no change during other times, the equation reduces to:

$$DB = \beta_0 + \beta_1 + \gamma_1 \sum_{s=0}^{\infty} \Delta u_{t+s-1},$$

The summation in the last term can be written as:

$$\sum_{s=0}^{\infty} \Delta u_{t+s-1} = \Delta u_{t-1} + \sum_{s=0}^{\infty} \Delta u_{t+s}$$

Assuming that the there is initially no change in unemployment (i.e. $\Delta u_{t-1} = 0$), we get:

$$DB = \beta_0 + \beta_1 + \gamma_1 DB,$$

Rearranging then gives the expression for the dynamic beta:

$$DB = \frac{\beta_0 + \beta_1}{1 - \gamma_1}.$$

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