August 2013
IMF Country Report No. 13/254

Japan: Selected Issues

This Selected Issues on Japan was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on July 12, 2013. The views expressed in this document are those of the staff team and do not necessarily reflect the views of the government of Japan or the Executive Board of the IMF.

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INTERNATIONAL MONETARY FUND

JAPAN

SELECTED ISSUES

July 12, 2013

EXECUTIVE SUMMARY

The authorities' new agenda to raise growth and exit deflation marks an important departure from past policies. The background papers for the 2013 Article IV explore the implications and challenges of the new approach for fiscal, monetary, structural, and financial sector policies.

The first chapter examines implications for long-term bond yields. The analysis finds that so far, upward pressure on interest rates from high public debt has been offset by domestic factors, including a stable investor base with a preference for safe assets. As these effects could decline with population aging, yields could rise unless reforms are implemented to stimulate growth and reduce the public debt-to-GDP ratio. In such a scenario, long-term JGB rates would remain relatively low and stable.

The second chapter examines to what extent rising health care spending poses a fiscal risk. Despite favorable health outcomes and low overall health spending, population aging could lead to a rise in spending by 5 percentage points of GDP by 2030. Higher contributions and various reforms could cover about three-fourths of the rising funding need, leaving a substantial financing gap.

The third chapter explores whether exiting deflation is made more difficult by population aging. The analysis finds that a declining labor-force participation rate, falling land prices, and currency appreciation following the repatriation of foreign savings by the elderly could all create deflationary pressures. These effects are magnified by a large and sustained fiscal consolidation need. A combination of structural reforms, aggressive monetary easing, and fiscal consolidation could overcome these deflationary headwinds.

The fourth paper analyzes the effects of Japan's dual labor market on growth. Excessive duality can lower total factor productivity (TFP) growth by reducing workers' effort and firms' incentives to train them. Reforms aimed at narrowing the difference in employment protection between regular and temporary workers could significantly reduce duality in Japan, thus stimulating TFP and growth.

The fifth chapter explores how Japanese banks' sovereign exposure may change under the authorities' new policies. The analysis finds that interest risks could decline if a full package of reforms is implemented, but if structural and fiscal reforms remain insufficient to raise growth and assure sustainability, interest-risk exposures of Japanese banks could increase again.

The sixth chapter discusses whether the reforms would lead to a further increase of cross-border activities by Japanese financial institutions. Stronger domestic growth in Japan could mitigate the pace, but is unlikely to reverse a long-standing trend because empirical estimates suggest that global and regional factors play a more prominent role in the growth of Japanese cross-border claims. The continued increase of cross-border activity could raise foreign currency funding risks and require close monitoring.

Approved by
Asia and Pacific Department

Prepared by Derek Anderson, Chie Aoyagi, Serkan Arslanalp, Dennis Botman, Giovanni Ganelli, Ben Hunt, Kenichiro Kashiwase, W. Raphael Lam, Masahiro Nozaki, Ikuo Saito.

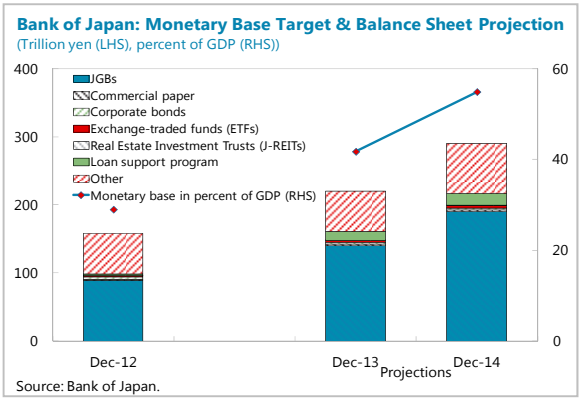
CONTENTS

DETERMINANTS OF LONG-TERM INTEREST RATES IN JAPAN AND IMPLICATIONS UNDER THE GOVERNMENT'S NEW POLICIES[1]

This note examines the key determinants of long-term sovereign yields using a panel of the main advanced economies. Empirical results suggest that Japan's forward rates are determined by fiscal conditions, demography, growth and the inflation outlook, and the investor base of government securities. Deteriorating fiscal conditions would push up long-term rates by about 2 percentage points over the medium term, but the effect is partly offset by higher demand for safe assets amid population aging and increased purchases by the Bank of Japan (BoJ). A widening trade deficit, surprisingly, only contributes modestly to long-term yields, in part because of Japan's sizeable net foreign assets holdings.

A. Background

1. In April 2013, the BoJ has introduced a new quantitative and qualitative monetary easing (QQME) framework by doubling the purchase size of Japanese government bond (JGB) and extending the average maturity of JGB holdings in an effort to meet the 2 percent inflation target and lift growth (text chart). The QQME is part of the government's three-pronged approach to revitalize Japan—also known as Abenomics—that includes flexible fiscal policy, aggressive monetary easing, and structural reforms.



2. The impact of the new policies on the level and volatility of long-term JGB rates is mixed (Figure 1). The JGB market exhibited unusual volatility in the immediate aftermath of the QQME announcement, about four times the average volatility and the highest since the last spike in 2003. This volatility likely reflects two opposing forces on long-term interest rates: on the one hand, through sizeable purchases under QQME (around 20 percent of GDP for next two years), the BoJ intends to lower long-term interest rates further; but on the other hand, if the BoJ succeeds in achieving the 2 percent inflation target over the medium term, nominal long-term rates are likely to rise from current levels, thereby posing losses to financial institutions holding or buying more long-term JGBs. The uncertainty on the level of future JGB yields matters particularly for institutional investors including domestic banks, insurance companies, and pension funds, which hold nearly three-quarters of outstanding JGBs. As a result, a reassessment of portfolio compositions likely contributes to changes in long-term interest rates, which have risen by 20–40 basis points during April to June. Nonetheless, yields remain low at about 90 and 180 basis points for 10-year and 30-year JGBs, respectively.

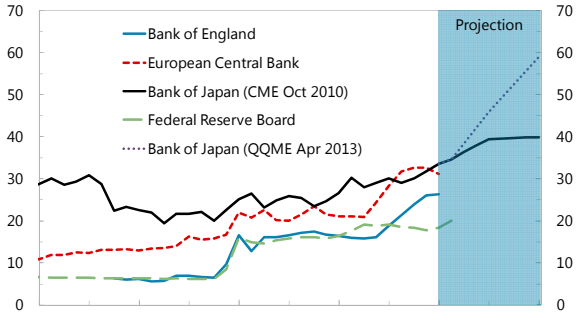
[1] Prepared by W. Raphael Lam (APD).

Figure 1. JGB Market under Abenomics and QQME

The BoJ announced sizeable easing, putting its balance sheet the largest among central banks in percent of GDP

Central Bank Balance Sheets

(In percent of GDP)

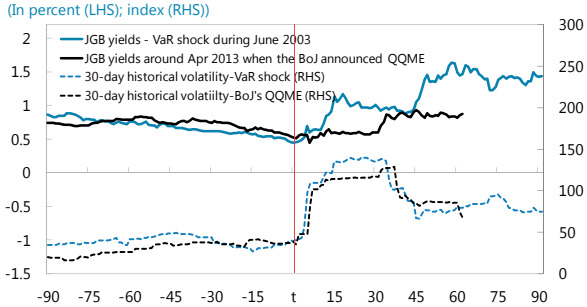


Source: Individual central banks and IMF staff estimates.

Volatility of bond yields rose sharply immediately after the announcement of the QQME measures…

Ten-year JGB Yields and Volatility

(In percent (LHS); index (RHS))



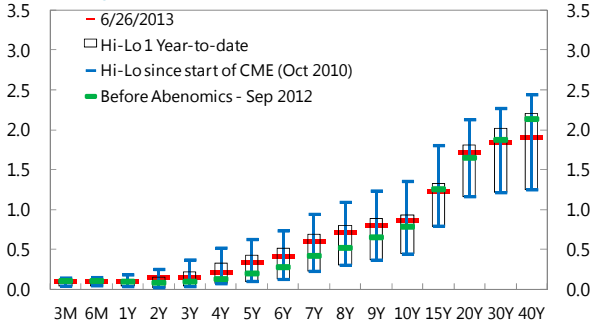
Source: Bloomberg.

1/ JBG yields rose over 100 basis points briefly during mid-2003. Banks sold sizeable JGBs holdings under risk management policies due to volatility exceeding the value-at-risk (VaR) thresholds. The episode was called the 'VaR shock' in the JGB market. Lowest yields near VaR shock ocurred June 22, 2003, while for QQME event it ocurred March 27, 2013. Horizontal axis shows trading days before and after shock at "t."

Though JGB yields rebounded from the lowest levels since the announcement, they remain at low levels.

JGB Yield Curve and Range 1/

(In percentage points)



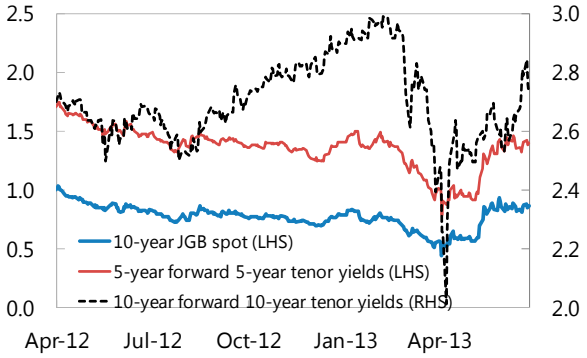
Source: Bloomberg.

1/ Range indicates max & min yields per maturity per indicated period.

The forward rates on JGB yields also exhibited significant volatility despite low yields…

JGB Spot and Forward Yields

(In Percent)

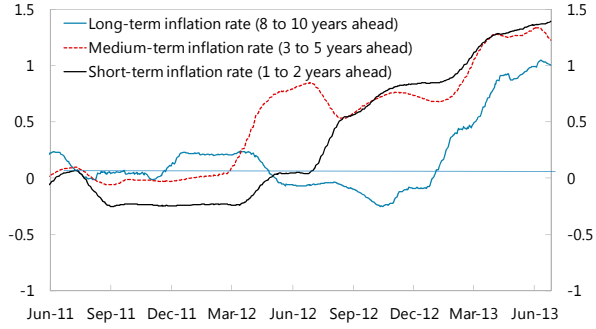


Source: Bloomberg.

Inflation expectations are on the rise but still falls short of the 2 percent target…

Inflation Expectations 1/

(In percent; y/y)



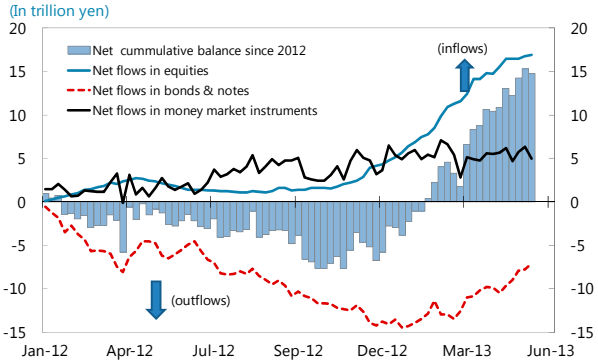
Source: Bloomberg.

1/ Estimated as 1 MMA of implied CPI based on inflation swap bid and ask prices.

Despite JGB volatility and yen depreciation, there have been no notable capital outflows abroad.

International Transaction in Securities 1/

(In trillion yen)



Source: Japan Ministry of Finance.

1/ Cummulative positions since January 2012.

3. Several factors are often cited as contributing to low and stable JGB yields, but their quantitative impact is less known. Hoshi and Ito (2012) pointed out that Japan has been able to "defy gravity"—low and stable yields despite a soaring public debt-to-GDP ratio—over the past two decades. In addition to low growth and lingering deflation, the low and stable sovereign yields could be attributable to several factors (Figure 2):

- *Fiscal conditions*—The public debt to GDP ratio has increased markedly for the last two decades. Gross and net debt-to-GDP ratios have reached 230 and 127 percent in 2011, respectively, and are expected to rise over the medium term. The deteriorating fiscal conditions are likely to exert an upward pressure on long-term rates, although this could be mitigated by expectations of drastic fiscal reforms to restore fiscal sustainability well before the public debt exceeds the private sector financial assets.[2]
- *External surpluses*—Unlike most other advanced countries, Japan has sizeable net foreign assets (over 50 percent of GDP) and has run a current account surplus over the past decade, supported by steady and large net-income flows.
- Population aging—Population aging would reduce labor force participation and potential growth. At the same time, elderly households tend to have a higher risk aversion and prefer holding safe assets such as JGBs, although the elderly tend to have lower saving rates.[3] This is likely to exert downward pressure on long-term interest rates.
- Stable investor base—Over 90 percent of JGBs are held by domestic investors, which has not changed substantially during the global financial crisis. This is in contrast to other advanced countries, where rising sovereign debts has been met with an increasing reliance on foreign investors, which may pose higher refinancing risks. This advantage, however, needs to be weighed against potential vulnerabilities from increasing sovereign-financial linkages in Japan.

While these factors have contributed to low and stable yields, the outlook of long-term JGBs financing is also influenced by policies, which could strengthen or weaken these factors in determining long-term yields. In addition to the QQME, the planned increase of consumption tax rates, a widening trade deficit, and uses of corporate surpluses may change the outlook of long-term financing of JGBs.[4]

[2] The total tax-to-GDP ratio for Japan is still low at around 30 percent (including payment into the social security system) and has room to increase to a level comparable to European countries to eliminate the financing gap.

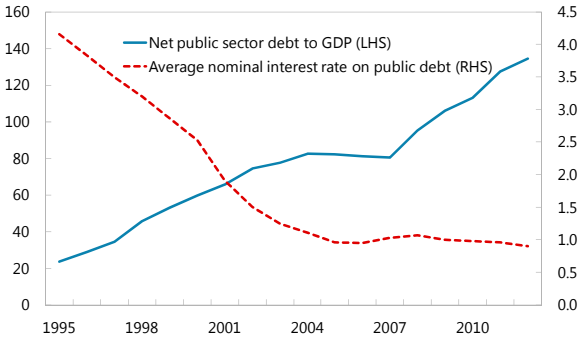
[3] In Japan, households hold more than half of financial assets in cash or deposits. Hashiwagi and Lam (2011) examines the saving behavior across age and cohort groups using household survey data and finds that over the medium term, the effect of risk aversion on asset allocation toward government securities among the elderly is likely to exceed the impact of a reduction of elderly saving rates.

[4] These new issues were not covered in earlier studies written on long-term financing aspects of JGBs (Tokuoka, 2010; Lam and Tokuoka, 2011; Hoshi and Ito, 2012; Baba, 2012). Poghosyan (2012) looked into the determinants of short-term and long-term yields across advanced countries.

Figure 2. Public Debt and Factors Contributing to Low Interest Rates

Net Debt Ratio and Interest Rate on Public Debt

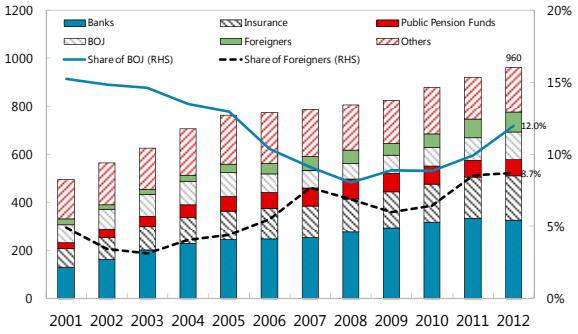
(In percent of GDP (LHS); in percent (RHS))



Source: IMF staff estimates.

Holdings of JGBs, by Investor Base

(in trillions of yen and in percent of total outstanding JGBs as of end-2012)

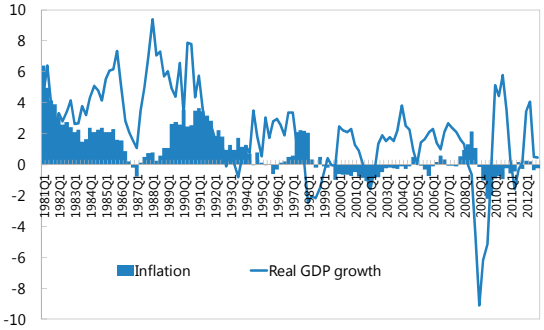


Sources: BOJ Flow of Funds

Notes: JGBs include FILP bonds and T-bills. Post Bank is included in "Banks."

Japan: Quarter-on-quarter Annualized Growth and Inflation

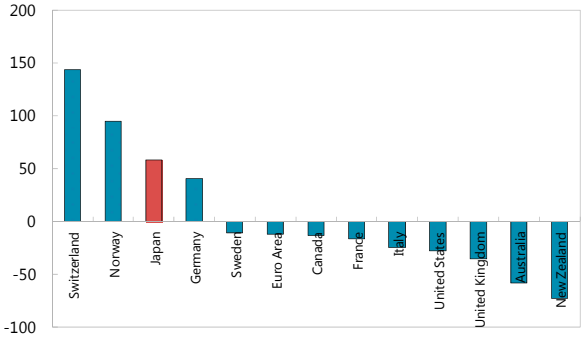
(in percent; 4-quarter moving average)



Sources: WEO; IFS

International Investment Position--Net Assets

(in percent of GDP; end-2012)

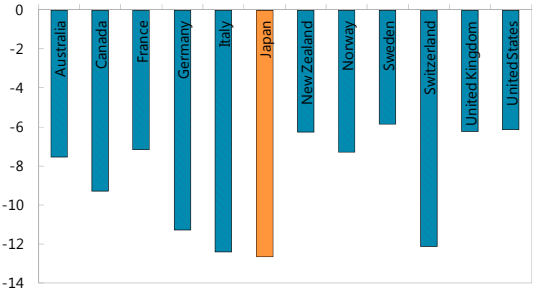


Sources: IFS, IMF Stat.

1/ Data as of end-2012 if available, otherwise it is an average of quarterly data available for 2012.

Cumulative Decline of Working-Age Population Ratio (between 2010-2050)

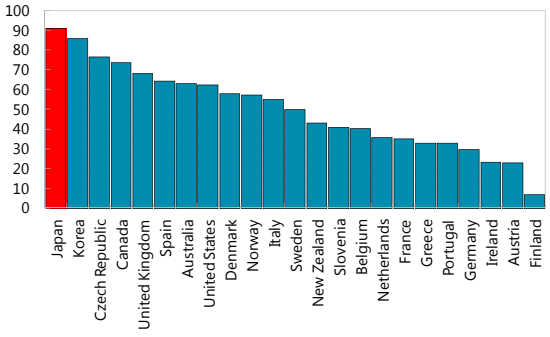
(in percent)



Source: United Nation

Share of Public Securities Held by Domestic Sector

(in percent of total public securities)



Source: Arslanalp and Tsuda (2012).

B. A Panel Analysis on the Determinants of Long-Term Interest Rates

4. This section builds on previous analyses on the determinants of long-term yields across advanced countries. Specifically, Ichiue and Shimizu (2012) provides quantitative estimates of factors that determine long-term interest rates, but do not incorporate the recent policy changes nor assess how these factors may evolve over the long term. The current econometric framework also extends on the estimation approach by analyzing the role of the investor base in affecting long-term sovereign yields.

- *Country and sample period*. Countries in the panel estimation include Australia, Canada, France, Italy, Germany, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States. Euro area countries other than Germany (in some specification for robustness, France and Italy) are excluded as interest rates across euro area were aligned until the European debt crisis broke out.[5] The sample period spans from 1990–2012 based on annual data.
- Dynamic panel estimation.
- $E_t i_{t+\tau,j} = c_j + \boldsymbol{\beta_1} E_t \boldsymbol{EXT}_{t+\tau,j} + \boldsymbol{\beta_2} E_t \boldsymbol{FIS}_{t+\tau,j} + \beta_3 E_t DG_{t+\tau,j} + \beta_4 E_t y_{t+\tau,j} + \beta_5 E_t \pi_{t+\tau,j} + \beta_6 InvBase_{t,j} + \varepsilon_{t,j}$
- The regression is based on the variables expectation at time *t* for τ period ahead; *j* denotes country in the cross-section group. The dependent variable $E_t i_{t+\tau,j}$ is the nominal forward rate of 5–10 years ahead (that is, 5-year forward of 5-year tenor rates).[6] *EXT* and *FIS* are vectors of variables related to external and fiscal conditions both in terms of flows and stocks. Variables for external conditions include the current account balance and the net external balance (as percent of GDP). Fiscal variables include net government debt and/or, public assets as a percent of GDP as a stock variable and primary balance or cyclical fiscal balance (in percent of GDP) as a flow variable. A dummy variable is introduced to interact with fiscal variables to assess if structural differences occur after the global financial crisis given that sovereign bonds in some countries are perceived as safe haven assets. *DG* is the demographic factor measured by the (annualized) growth rate of the working-age population ratio. Variables *y* and π refer to real growth and inflation. *InvBase* refers to the portion of sovereign bonds held by central banks, foreign official entities, or domestic private financial institutions depending on the specification.
- A longer time horizon τ for the dependent variable is preferable, but the choice is subject to data availability. The estimation uses 6–10 years ahead for demography variables and at least 2 years ahead for growth, inflation, fiscal and external conditions from Consensus Forecast and World Economic Outlook. The estimation uses Arellano-Bond dynamic panel estimator with a maximum lag of 4.

[5] Regression estimates for two groups of countries are included. Group 1 includes all countries except France and Italy as they are in the euro area that is broadly represented by Germany, while Group 2 includes both France and Italy.

[6] Data on 5-year forward of 10-year tenor rates or 10-year forward of 10-year tenor rates are not available for long periods dated back to 1990 and are difficult to be estimated without 15-year or 20-year sovereign bonds in several countries.

- The results include four sets of specifications (1 to 4, Table 1), each including a specific group of investors in government securities (the central bank, domestic financial institutions, domestic entities, and foreign nonofficial investors). For each set of specification, additional estimates are provided for different country groups and different explanatory variables for robustness check.
- Estimation results.

  a. **Fiscal conditions** are key contributing factors for long-term sovereign yields across specifications in the panel. For instance, a 1 percentage point rise of net government debt to GDP would increase the long-term yields by 2–4 basis points over the sample, but the rise appears smaller by one-third to one-half after the global financial crisis, perhaps reflecting higher global risk aversion and therefore greater demand for safe government securities. Cyclical or primary balances, however, do not seem to exert statistical significant effects on long-term rates unless the specification uses gross debt terms and gross government assets. The *stock* of net public debt appears to be more influential in determining long-term interest rates.

  b. **External positions** appear to affect long-term rates but are seldom statistically significant. This runs counter to the idea that Japan would run into a fiscal crisis when the current account turns into deficits. The estimates suggest that government debt may become unsustainable even when the current account stays in surplus if domestic savers refuse to finance the public debt at a low rate and shift their savings abroad. On the contrary, a fiscal crisis may not happen even when the current account turns to a deficit if that is driven by a strong direct investment inflows that lift up the growth potential.

  c. The estimated coefficients for **inflation expectations** are strongly significant as expected and in many specifications the coefficients are not statistically different from one, consistent with economic theory. In that context, real forward rates (nominal net of inflation expectations) are also used as dependent variable for robustness purposes. The coefficients for other explanatory variables remain broadly similar. Volatility of inflation expectations, however, does not appear to affect the level of long-term rates. Coefficients on real growth across specifications are statistically significant and have an expected positive sign. In sum, inflation expectations and growth are key factors in affecting long-term rates.

  d. **A reduction in working-age population** tends to reduce the long-term interest rates. The magnitude appears to be significant and large.

  e. **The composition of the investor base** for government securities is important for long-term interest rates. Higher holdings by domestic entities tend to lower interest rates, but the cross-country estimates show that this reduction is mostly driven by central banks' holdings rather than holdings by domestic financial institutions. Interest rates tend to go up instead if more public debt is held by financial institutions. On the other hand, higher holdings of government securities by the foreign nonofficial sector tend to reduce yields, but do not seem to be statistically significant.

Table 1. Estimation of Determinants of Long-Term Interest Rates 1/ 2/

Dependent variable: Long-term interest rate (forward rate 5yr/5yr)

	Specifications											
	(1)	(1a)	(1b)	(2)	(2a)	(2b)	(3)	(3a)	(3b)	(4)	(4a)	(4b)
Constant	-0.389	-0.651	0.900	-0.345	-0.664	0.716	**-7.262****	**-6.463****	**-3.690***	-0.399	-0.973	**1.842***
	(0.484)	(0.468)	(1.296)	(0.491)	(0.527)	(1.115)	(2.137)	(1.933)	(2.079)	(0.855)	(0.883)	(1.018)
Fixed effect	*Arellano-Bond dynamic panel estimation*											
Lagged dependent variable	**0.381*****	**0.411*****	**0.342*****	**0.288****	**0.353*****	**0.336*****	**0.222****	**0.223*****	**0.217***	**0.254****	**0.340*****	**0.183***
	(0.075)	(0.066)	(0.091)	(0.114)	(0.102)	(0.088)	(0.094)	(0.073)	(0.114)	(0.118)	(0.105)	(0.113)
Fiscal conditions												
Net government debt / GDP	**0.019***	**0.027****	0.011	0.021	0.026	0.008	**0.027****	**0.026***	0.012	**0.036***	**0.037****	0.008
(2 years ahead)	(0.010)	(0.013)	(0.011)	(0.019)	(0.017)	(0.010)	(0.015)	(0.015)	(0.008)	(0.020)	(0.018)	(0.010)
Net government debt / GDP interacting with												
dummy on financial crisis	**-0.010*****	**-0.010****	**-0.012***	**-0.009***	-0.008	-0.009	**-0.011*****	**-0.008*****	**-0.016****	**-0.012****	**-0.011****	**-0.015****
(2 years ahead)	(0.005)	(0.004)	(0.007)	(0.006)	(0.005)	(0.006)	(0.003)	(0.003)	(0.006)	(0.006)	(0.006)	(0.008)
Government assets / GDP	-	-	-0.015	-	-	-0.017	-	-	-0.007	-	-	-0.023
(2 years ahead)			(0.017)			(0.016)			(0.010)			(0.015)
Government assets / GDP interacting with												
dummy on financial crisis	-	-	-0.009	-	-	-0.006	-	-	**-0.011***	-	-	**-0.013****
(2 years ahead)			(0.006)			(0.005)			(0.006)			(0.006)
Cyclically adjusted primary balance / GDP	-0.032	-0.030	**-0.122***	-0.048	-0.057	**-0.126****	-0.072	-0.074	**-0.142****	0.016	-0.004	**-0.128****
(1 year ahead)	(0.049)	(0.049)	(0.069)	(0.049)	(0.062)	(0.064)	(0.045)	(0.046)	(0.062)	(0.055)	(0.069)	(0.054)
External positions												
Current account balance / GDP	-0.050	-0.027	-	-0.026	-0.003	-	-0.006	0.006	-	-0.012	0.019	-
(2 years ahead)	(0.053)	(0.043)		(0.039)	(0.033)		(0.042)	(0.035)		(0.043)	(0.033)	
Balance of goods and services / GDP	-	-	-0.017	-	-	-0.010	-	-	-0.003	-	-	0.033
(2 years ahead)			(0.040)			(0.043)			(0.035)			(0.044)
Net foreign assets / GDP	-0.030	-0.018	-0.021	-0.015	0.001	-0.020	0.013	0.021	0.003	-0.006	0.006	**0.015***
(2 years ahead)	(0.039)	(0.032)	(0.031)	(0.029)	(0.024)	(0.030)	(0.018)	(0.015)	(0.020)	(0.025)	(0.024)	(0.009)
Real sector												
Real growth	**0.243*****	**0.220*****	**0.232*****	**0.212*****	**0.200*****	**0.230*****	**0.050***	0.030	**0.084***	**0.229*****	**0.216*****	**0.149*****
(2 years ahead)	(0.058)	(0.061)	(0.057)	(0.055)	(0.055)	(0.059)	(0.031)	(0.040)	(0.046)	(0.061)	(0.061)	(0.055)
Working age population ratio growth rate	**1.884****	**1.964*****	**1.712*****	**1.933*****	**2.034*****	**1.715*****	**1.593*****	**1.606****	1.540	**2.099*****	**2.184*****	**1.722*****
(6-10 years ahead)	(0.358)	(0.376)	(0.452)	(0.317)	(0.375)	(0.441)	(0.173)	(0.259)	(0.383)	(0.292)	(0.336)	(0.403)
Inflation expectation	**0.762*****	**0.686*****	**0.684*****	**0.871*****	**0.730****	**0.698****	**0.976*****	**1.116*****	**0.968*****	**0.709****	**0.648****	**0.695****
(6-10 years ahead)	(0.237)	(0.207)	(0.184)	(0.283)	(0.284)	(0.184)	(0.196)	(0.175)	(0.212)	(0.309)	(0.315)	(0.296)
Volatility of inflation expectation	-	-	0.530	-	-		-	-	1.514	-	-	1.530
			(0.697)						(1.047)			(1.032)
Investor base of government securities (share)												
Holdings of the central banks	**-0.056****	**-0.061****	**-0.068****	-	-	-	-	-	-	-	-	-
	(0.026)	(0.023)	(0.022)									
Holdings of domestic financial institutions	-	-	-	-	-	-	**0.107*****	**0.095****	**0.064****	-	-	-
							(0.023)	(0.023)	(0.025)			
Holdings of domestic entities	-	-	-	**-0.007****	**-0.006****	**-0.003****	-	-	-	-	-	-
				(0.002)	(0.003)	(0.002)						
Holdings of foreign nonofficial sector	-	-	-	-	-	-	-	-	-	0.024	0.022	0.004
										(0.018)	(0.021)	(0.013)
Wald-statistics	233.4	895.3	271.7	637.7	1812.7	945.6	1046.9	1135.0	686.5	437.8	1187.0	197.4
Observations	176	210	176	172	206	172	185	225	189	159	193	173
Number of groups (advanced countries)	10	12	10	10	12	10	10	12	10	10	12	10

1/ Estimates based on 10-12 advanced countries. Estimation for the 10 groups excludes France and Italy in the euro zone.
2/ *, **, and *** denote the statistical significance level of 10 percent, 5 percent, and 1 percent, respectively.

5. The estimates allow us to quantitatively assess to what extent each factor drives long-term rates over time (Figure 3). As we are primarily interested in the determinants of long-term rates under the QQME and rising public debts, we use estimates from specification (1) to obtain the contributions of each factor.

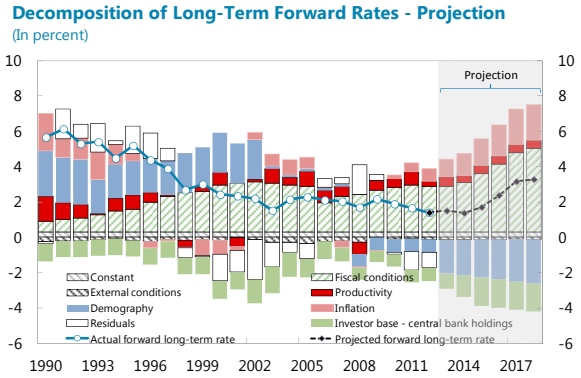
- The decomposition suggests low growth, disinflation, and aging of the population since mid-2000s have contributed to the low and stable long-term rates, which more than offset the impact of deterioration of fiscal conditions.
- The sizeable purchases by the BoJ are likely to keep long-term rates lower by 70–150 basis points for the next few years under the QQME.
- If the three-pronged strategy is able to exit deflation and lift growth, the long-term rates are likely to increase but at a modest pace.
- The long-term interest rate, however, is likely to be dominated by the deteriorating fiscal conditions over the medium and long term based on current policies. Long-term rates are expected to rise by 4 percentage points to near 5½ percent between 2012 and 2030, of which deterioration in fiscal conditions contributed to 3½ percentage points (about 3 percentage points from the projected rise of the net public debt ratio from 134 percent in 2012 to near 210 percent of GDP by 2030 and the large fiscal deficits account for ½ percentage points). Inflation and higher growth would add another 2 percentage points, while shrinking external surpluses contributed another ½ percentage points to nominal yields. The net increase, however, would be much smaller because of population aging (-1¼ percentage points), BoJ purchases (-¾ percentage points), and other factors (Figure 3).

6. Under an upside scenario with a full policy package, the long-term interest rates are likely to remain stable in the long run (Figure 3). In line with the model analysis in the staff report, the full policy package assumes credible fiscal policy adjustments and structural reforms that will achieve a declining public debt trajectory and higher potential growth. In addition, this analysis further assumes a gradual exit of the unconventional monetary easing by the BoJ after achieving the inflation target. In this regard, higher growth and lower holdings by the BoJ would push up slightly interest rates over the medium term, relative to the baseline, while the near-term interest rates remain low and stable. Notably, lower public debt ratios, together with a long-term primary surplus, would keep long-term nominal interest rates at stable levels at about 4 percent over the long term.[7] This implies that real interest rates would be at a range of 1.2–1.9 percent over the medium term.

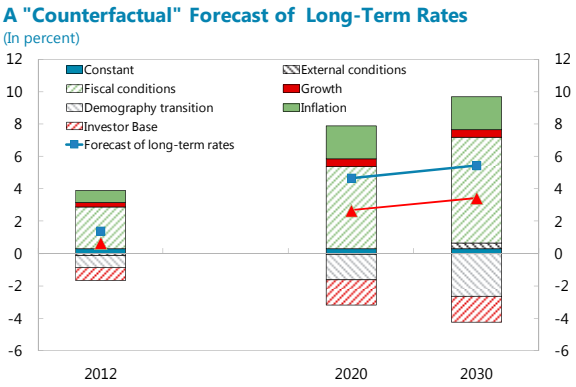
[7] See the accompanying Staff Report for the Article IV consultation with Japan and 2013 Spillover Report.

Figure 3. Decomposition of Long-Term Interest Rates

A. Based on current announced policies

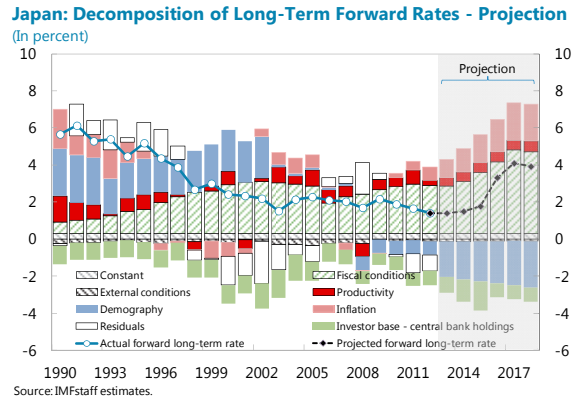


Sourc: IMF staff estimates.
1/ Based on a panel regression of 10 advanced countries.

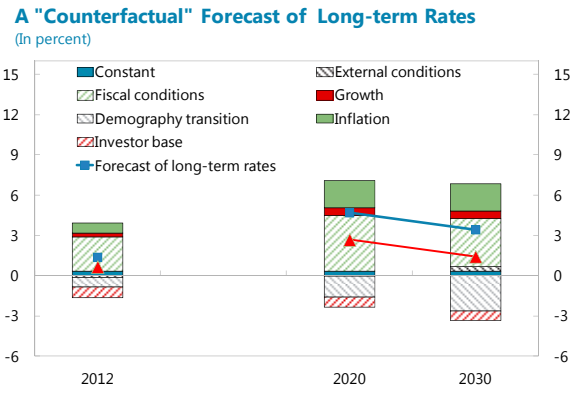


Source: IMF staff estimates.

B. Full three-pronged strategies including credible medium-term fiscal plans and structural reforms



Source: IMFstaff estimates.
1/ Based on a panel regression of 10 advanced countries.



Source: IMF staff estimates.

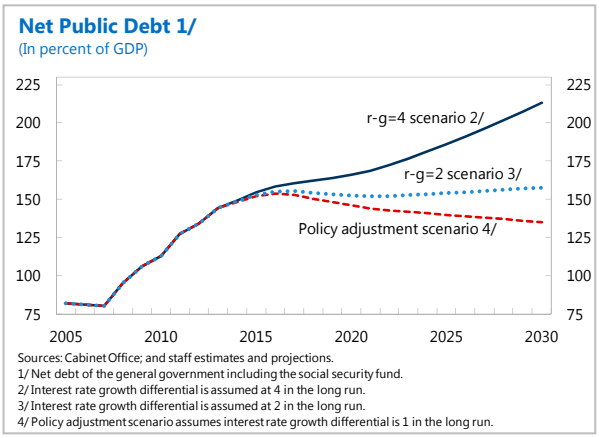
Caveats of the estimation and projection

- Given the BoJ's new monetary framework, the impact on long-term interest rates may behave differently than predicted by the model, which uses the estimated coefficients from historical correlations. In addition, the estimates focused on long-term interest rates and cannot account for short-term volatility in JGB markets.
- The panel estimation may not fully capture all the determinants of long-term interest rates, particularly those unique to Japan that have kept yields low and stable over the past decade. Nonetheless, the estimation appears to provide a reasonably good fit for Japan and has shown that some factors, such as the large domestic holdings of JGBs, low growth, and persistent deflation have contributed to low yields despite rising public debts in Japan.
- The explanatory variables are likely to have a *nonlinear* or a *threshold* effect on long-term rates that is not captured in the estimation and projection. For instance, interest rates would be subject to abrupt spikes rather than a gradual rise if there was severe loss of confidence in public debts and/or fears of debt monetization by the central bank. The influence of external

conditions may play a larger role in determining long-term rates if trade deficits are combined with a net debtor status in international investment positions. Similarly, extensive holdings of government bonds by domestic financial institutions may add to higher fiscal and financial linkages that eventually would add to the risk premium.

C. Implications

7. Steady long-term interest rates are critical for fiscal debt dynamics and financial stability. A rise of long-term rates, if not accompanied by robust growth and inflation, is likely to pose an additional burden on fiscal conditions and financial stability given the high debt level and substantial holdings of JGBs in the financial system. A 100-basis-point rise in interest rates would boost the budget deficit by about ½ percent of GDP over five years according to Cabinet Office estimates (2010). Regional banks that hold a large portion of long-term JGBs may be subject to higher interest rate risks if yields spike. A 100-basis-point rise in the yield curve would pose interest rate risks equivalent to about 20 percent of the Tier 1 capital in regional banks.[8]



8. More ambitious fiscal adjustment is necessary over the medium term to contain the risk of a surge in long-term rates. Since 2007, the worsening of fiscal conditions has contributed to an increase of interest rate by more than 1 percentage point. Based on the estimates, credible fiscal adjustments that lower medium-term projections of public debts and deficits can have an impact on the current level of long-term rates through a change of expectation. A successful implementation of Abenomics—that includes ambitious medium-term fiscal consolidation and growth reforms in addition to aggressive monetary easing—will be essential to keep long-term interest rates low and stable at levels broadly similar to nominal GDP growth rates.

9. Monetary policy alone cannot counter a potentially rising fiscal risk premium under current policies. Even if the BoJ expands its balance sheet to near 60 percent of GDP by 2014 under the QQME, the estimates indicate that long-term rates in Japan going forward are likely dominated by the deteriorating fiscal conditions.

10. In that regard, ambitious growth and fiscal reforms are necessary to contain fiscal risks. Without ambitious growth and fiscal reforms in train, the BoJ could face difficulties in maintaining stable long-term rates. Accelerating the pace of reaching the 2 percent inflation target may contribute to reviving growth and contribute to a "normalization" of long-term rates. It is expected the sizeable purchases would keep the long-term rates low and stable, but risks of policy

[8] Including loans, bonds and debt holdings would increase interest rate risks equivalent to about one-third of Tier 1 capital in the regional banks for a 100-basis-point value based on BoJ estimates (Financial System Report, April 2013).

missteps are notable. The path to exit deflation and lift growth may be subject to substantial risks: for instance, inflation expectations may remain subdued or rise without corresponding improvements in wages and growth. Financial institutions may change their investment strategies from JGBs that pose risks to the interest rates.

11. Though there is scant evidence on the role of trade deficits on long-term interest rates, maintaining external stability remains important. Deteriorating external conditions in Japan would imply a heavier reliance of foreign investors in financing the public debt. This may increase the volatility of long-term interest rates even without significantly imposing a risk premium on long-term government bonds.

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JAPAN'S HEALTH AND LONG-TERM CARE SYSTEM: FISCAL PROJECTIONS AND REFORM OPTIONS[1]

Japan's health spending has increased significantly for the past two decades, but is low by international comparison and has succeeded in promoting health and longevity. Spending is projected to continue to increase from the current 9.4 percent to 14.4 percent of GDP in 2030, given demographic changes and past cost trends. Out of the 5-percentage-point increase in health spending over the next two decades, 3 points would have to be financed by the government, which would complicate an already difficult fiscal consolidation process. Japan's health system is generally regarded as cost effective, yet it shows signs of inefficiency. Various reform options considered here could save 1.8 percent of GDP in 2030, and more drastic reforms are needed to fully offset the expected increase in spending. Although long-term health spending projections are uncertain, estimates could understate the rise in costs and pose a downside risk to the fiscal sustainability of Japan.

A. Introduction and Main Findings

1. Universal health coverage has contributed to a dramatic improvement of Japan's health outcomes over the past 60 years (Figure 1). Life expectancy increased from 50 to 80 years over 1947–2011 for males. Likewise, female life expectancy increased from 54 to 86 years over the same period. Universal health coverage established in 1961 (Box 1) has played a critical role in this success, along with improvements in societal factors, such as income, education, nutrition, and sanitation. In addition, the health care (HC) system has achieved and maintained equal access to care for all people at an affordable cost. (Ikeda and others, 2011).

2. With the country's rapidly aging population, the government introduced mandatory public long-term care (LTC) insurance in 2000. The system is built on a social insurance principle (Box 1) in which the government provides care as an entitlement to eligible population. Its services are financed from mandatory contributions from those aged 40 or older. Coverage and benefits of the LTC insurance is generous. It provides care in an institutional setting, as well as home and community based services. The number of public service users has significantly increased since 2000.

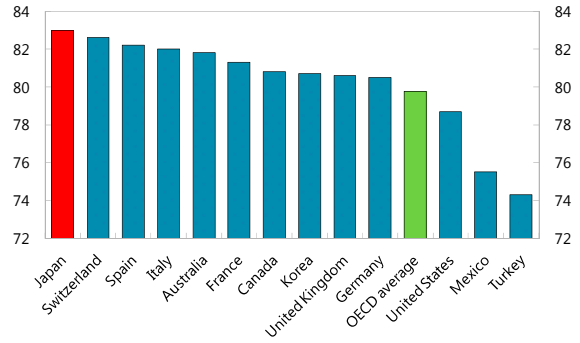
3. Financing of the HC and LTC system, however, is coming under pressure (Figure 1). The funding for the system is sensitive to changes in demographic and economic factors, which raise utilization of services, while lowering private contributions. Subsidies from general revenues and cross-subsidization among different insurance plans, along with tightly regulated prices, have maintained its functioning, but the long-term financial sustainability of the system will increasingly come under pressure if demand for services and growth in private contribution continue on past trends.

[1] Prepared by Kenichiro Kashiwase (APD), Masahiro Nozaki (FAD), and Ikuo Saito (APD).

Figure 1. Health Performance and Spending

Life Expectancy at Birth

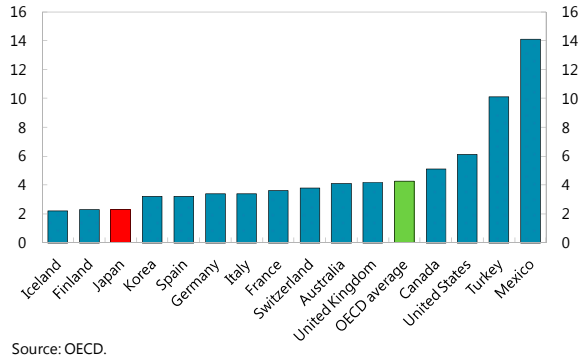
(Total population, years)



Source: OECD.

Infant Mortality Rate

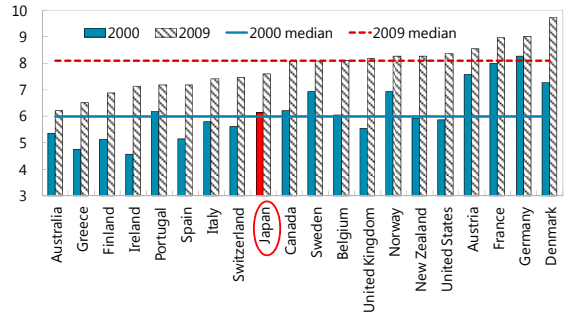
(Deaths per 1,000 live births)



Source: OECD.

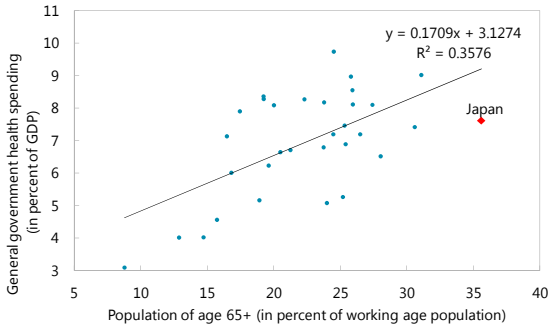
Selected Advanced Countries: General Government Health Spending, 2000-09

(In percent of GDP)



Source: OECD.

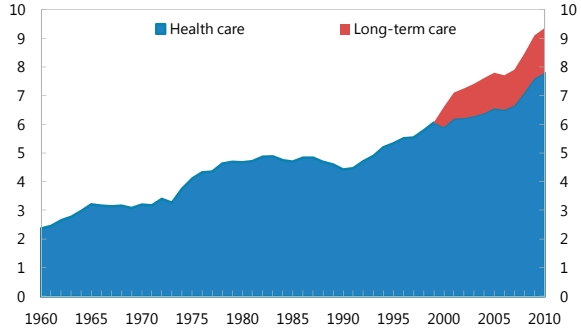
OECD Countries: General Government Health Spending and Old Age Dependency Ratio, 2009



Source: OECD.

Health and Long-Term Care Spending

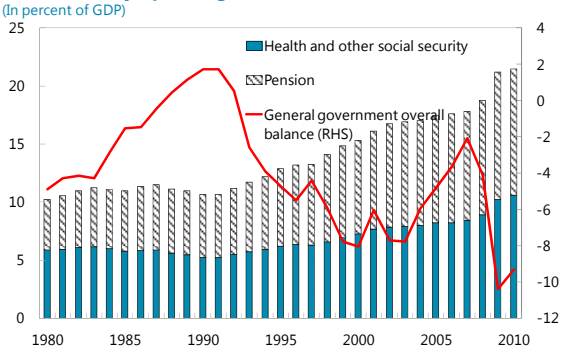
(In percent of GDP)



Source: MHLW.

Social Security Spending and Fiscal Deficit

(In percent of GDP)



Sources: Ministry of Finance; Fund staff calculations.

Box 1. Japan's Health System

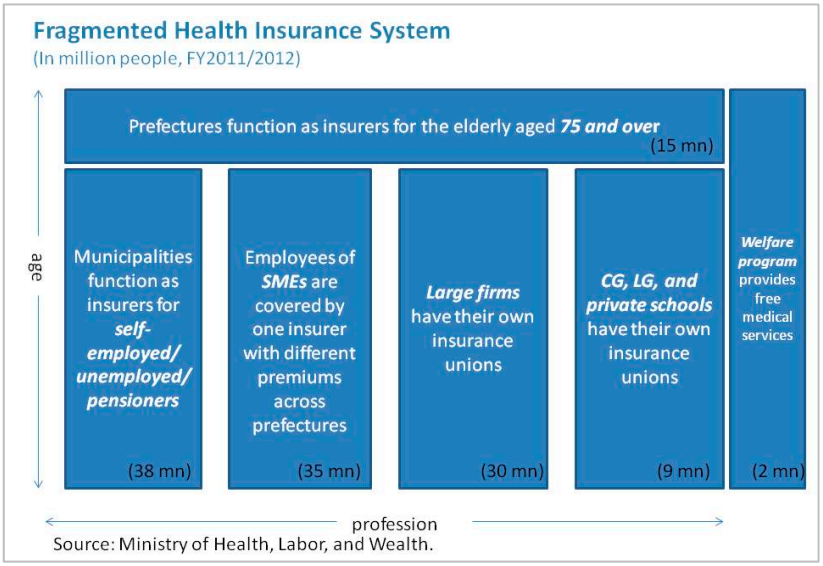
Japan's health system consists of universal health care (HC) and long-term care (LTC). The HC system virtually covers the entire population. The LTC system covers people at age 65 and older, as well as those in 40–64 years of age who meet eligibility criteria. Japan's HC system is highly fragmented. There are over 3,000 plans according to where they reside and where they are employed. The insured can choose any service providers. Other key features are as follows:

- ***Insurers.*** Age and employment largely determine one's insurers for HC (text figure). For people aged 75 and above, the prefecture of their residence serves as their insurer. For people aged 74 and below, four kinds of insurance programs exist. Employees of SMEs are all covered by one insurer (Kyokai Kempo), while employees of large firms are covered by their employers (Kumiai Kempo). For the latter, there are around 1,500 insurers. Public sector employees and teachers at private schools have their own insurers (Mutual Aid Association). All others (that is, self-employed, unemployed, and pensioners) belong to National Health Insurance Program (NHIP), which is administered by each municipality, and there are around 1,800 insurers. Likewise, LTC is administered by municipal governments.

- ***Contributions.*** Contributions for HC insurance are adjusted to income and differ across insurers. Kyokai Kempo has different contribution rates across prefectures although it is a single insurer. For employment based HC insurance, employers provide a matching contribution to each insured. Dependent spouses with annual income below 1.3 million yen are exempted from paying contributions. Contributions for the NHIP enrollees are based on a family unit. Contributions for LTC insurance are adjusted to income and differ across municipalities.

- ***Out-of-pocket payments (copayments).*** The copayment rate for the HC program is uniform (30 percent), except for pre-school children (20 percent) and the elderly (10 percent). The rate for LTC is 10 percent. The average effective copayment rate is low at 13 percent for HC and 10 percent for LTC. Copayments are subject to a monthly cap, which is based on age and income. People on the welfare program receive free care.

- ***Government controls.*** The central government sets unit prices of all medical procedures, drugs, and devices every other year, and they are applied uniformly to all physicians and hospitals (both private and public). Prices of public LTC services are also decided by the central government every three years.



Total spending on HC and LTC[2] more than doubled in percent of GDP during the last two decades. Although the share of public health spending to GDP is currently around the OECD average, with a rapidly aging population and increasing cost to provide HC and LTC, the share is expected to rise even further.

4. Our estimates show that the financing gap would rise by 3 percentage points of GDP in 2030. Given the assumptions of demographic change and the growth differential between health spending and GDP per capita (a.k.a. excess cost growth (ECG)) of 1 percent, total HC and LTC spending would increase by 5 percentage points over 2010–30. Assuming a modest and gradual increase in premiums equivalent to 1¾ percent of GDP over the next two decades, the government would need to substantially raise its funding for the HC and LTC system. The increase in transfers (financing gap) as a share of GDP would amount to 3 percentage points of GDP in 2030. Various reform measures examined below could save up to 1.8 percentage points of GDP. These measures include raising copayment rates, more efficient use of health resources, and higher reliance on generics. However, these options cannot fully close the financing gap.

5. The rise in total HC and LTC spending raises fiscal risks, although there is large uncertainty around the expenditure and revenue projections. Japan has already a large fiscal consolidation need to bring public debt on a downward path requiring a structural fiscal adjustment of 11 percent of GDP over the next decade according to IMF estimates. This assessment does not include the potentially sizeable increase in HC and LTC financing needs that this study finds. Although long-term projections—including ECG and an increase in premium revenue—entail large uncertainty, estimates could understate the rise in costs and pose a downside risk to the fiscal sustainability of Japan.

B. Spending Projections

6. Total HC and LTC spending in Japan has risen rapidly. After hovering around 4–5 percent of GDP during the 1980s, spending more than doubled during the last two decades, from 4½ percent in 1990 to 9½ percent of GDP in 2010. The introduction of public LTC insurance in 2000 also contributed to this increase.

7. The spending increase stems both from population aging and ECG (Figure 2, top chart).[3] During 2000–10, the ratio of total spending to GDP increased at a rate of 3.6 percent per year. About half of this (1.7 percentage points) is attributable to population aging, and the rest to ECG.

8. Moreover, ECG has been on an upward trend since the late 1980s. ECG was −1.5 percent per year during the 1980s, but picked up to 1.1 percent per year in the 1990s and 1.9 percent per year in the 2000s (Figure 2, top chart). The latter may reflect cyclical downturn or lower labor

[2] Total spending in this paper covers public and out-of-pocket spending on the HC and LTC system, while excluding private insurance. Data on HC spending comes from the national health expenditure (NHE) compiled by the authorities, and differs from total health expenditure calculated by the OECD based on the System of Health Accounts. The latter includes expenses that are not covered by Japan's public insurance system and thus not included in NHE, such as expenses related to prevention (for example, medical checks) and health promotion, and R&D.

[3] See Appendix for the methodology applied to the decomposition.

participation;[4] after controlling for these effects, however, ECG for 2000–10 was still as high as 1.3 percent per year. In addition, high ECG was observed across the board for different age groups.

9. The effects of population aging and a continuation of ECG trend imply that total HC and LTC spending could increase by 5 percentage points of GDP between 2010 and 2030 (Figure II.2, middle chart). This rise comes equally from the effects population aging (based on official population projections) and an acceleration of HC/LTC cost (ECG is assumed at 1 percent per year). This projection is in line with the authorities' forecast, which shows a spending increase of 4½ percentage points under a no-reform scenario and a rise by 5¾ percentage points under a reform scenario (Figure 2, bottom chart). If ECG is 2 percent per year, the increase would be 8¼ percentage points of GDP. As changes in ECG are difficult to project—especially as a larger share of the population enters the group of the very old (85 years and above)—there is large uncertainty around these estimates.

C. Financing Gap Projections

10. Total HC and LTC spending is financed by premiums, government transfers, and copayments (Figure 3). In 2010, premiums accounted for nearly half of HC financing and 45 percent of LTC financing. Government transfers (by the central and local governments) accounted for 38 percent of HC financing and 45 percent of LTC financing, with the rest accounted for by copayments, that is, out-of-pocket expenditure by patients.

11. Premium contributions are assumed to rise in line with the authorities' projections, while copayment rates remain unchanged. In the baseline scenario, the average contribution rate for HC (effectively a payroll tax rate) would increase by 3 percentage points to reach 10 percent in 2030.[5] The equivalent contribution rate for LTC would reach 2½ percent in 2030, an increase of 1¼ percentage points.[6] Effective copayment rates are assumed to remain at the 2010 level. The difference between the spending increase and increases in premiums and copayments widens the financing gap, which would need to be financed by an increase in government transfers.

[4] If health expenditure per capita is less cyclical than GDP per capita, ECG rises as the output gap becomes negative. Also, if health expenditure per capita is more closely linked to GDP per labor force, a decline in labor participation raises ECG.

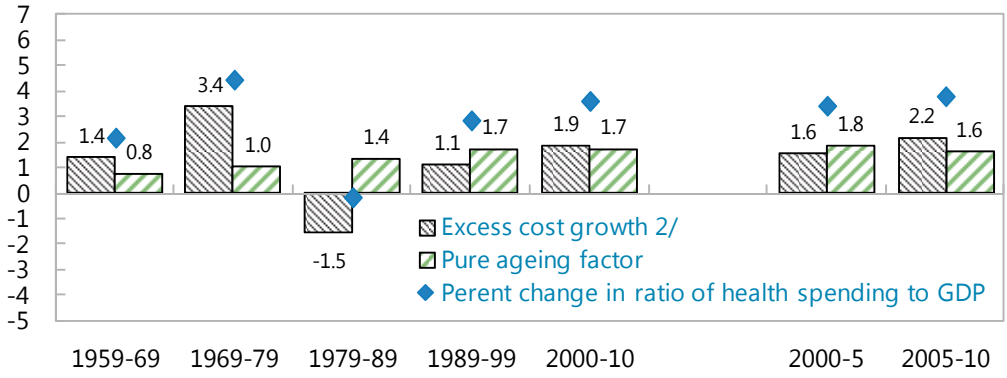
[5] The contribution rate for HC insurance is calculated partly in line with assumed ECG. For those aged 16–64, the average contribution rate (based on their labor income) would reach 12 percent in 2030, an increase of 3¾ percentage points. For those aged 65 or older, the contribution rate (based on their pension benefits) would reach 5.7 percent, an increase of 1½ percentage points. Beyond 2030, the contribution rates are assumed to increase by additional 7½ percentage points on average by 2060.

[6] The contribution rate for LTC insurance is calculated partly in line with assumed ECG. For those aged 40–64, the average contribution rate (based on their labor income) would reach 2 percent in 2030, an increase of ¾ percentage points. For those aged 65 or older, the contribution rate (based on their pension benefits) would reach 4.6 percent, an increase of 2 percentage points. Beyond 2030, the contribution rates are assumed to increase by additional 2¾ percentage points on average by 2060.

Figure 2. Health Spending Decomposition and Projections

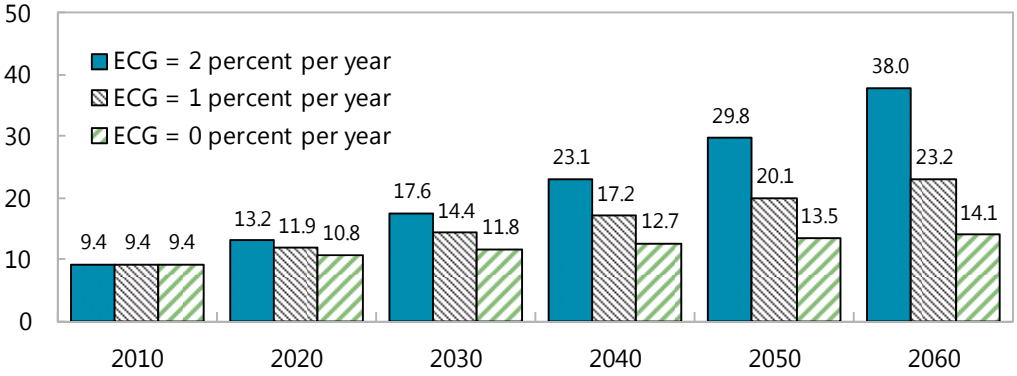
Decomposition of Health Spending Growth

(Annual percent change, period average) 1/



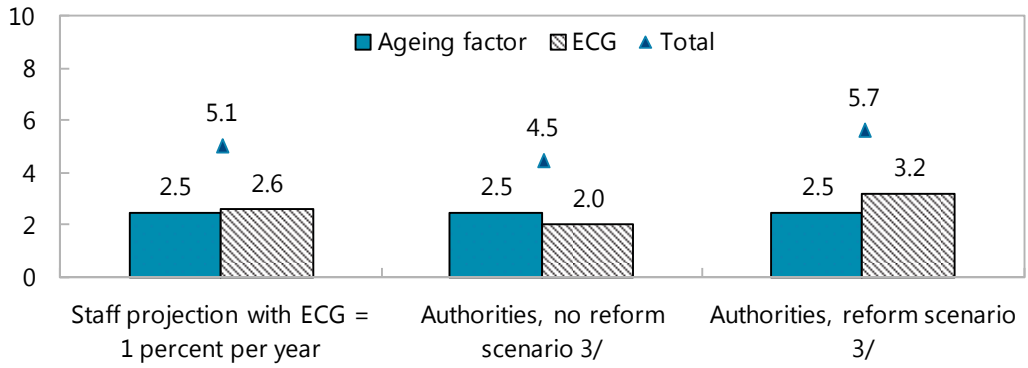
Health Care and Long-Term Care Spending

(In percent of GDP)



Changes in Health Care and Long-Term Care Spending, 2010-30

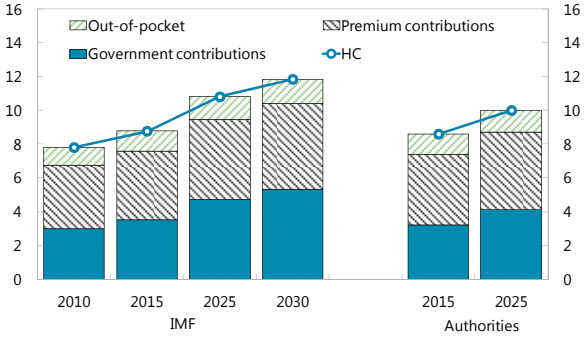
(In percent of GDP)



Source: IMF staff calculations.
1/ Comprises health care and long-term care spending.
2/ Includes contributions from healthy aging and residual (see Appendix).
3/ Staff calculations based on the authorties' projections through 2025. That is, an annual ECG implied by the authortiies' projections is computed from the same aging factor component used in staff projections. Then, the implied ECG (as well as the aging factor used in staff projections) is used to extend the authorities' projections to 2030.

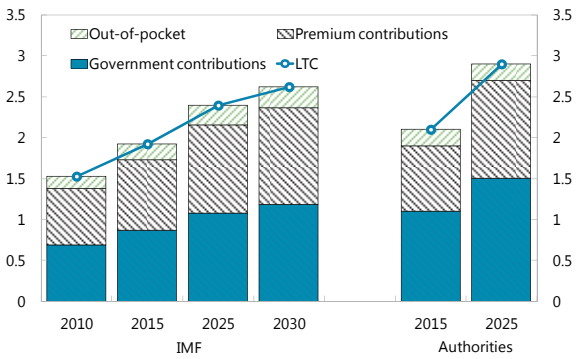
Figure 3. Financing Health Spending

Health Care Financing 1/
(Percent of GDP)

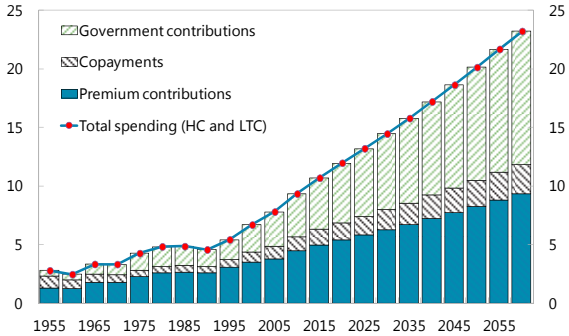


1/ Does not include long-term care financing.

Long-Term Care Financing
(Percent of GDP)

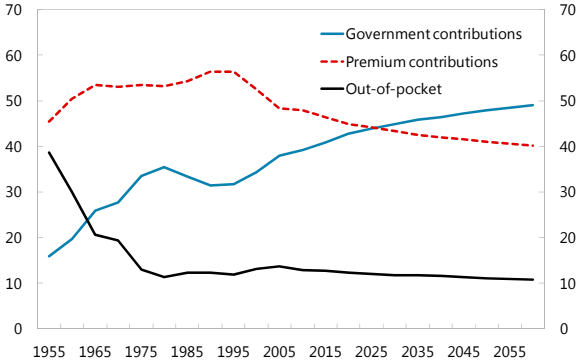


Financing of Health Care and Long-Term Care 1/
(Percent of GDP)

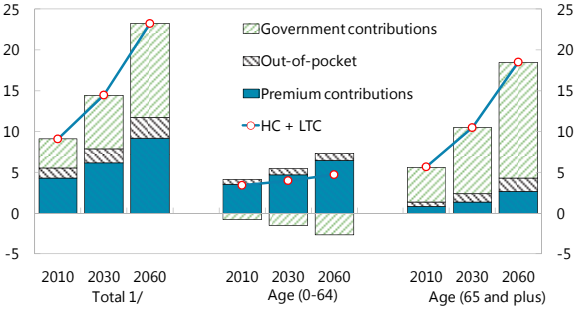


1/ Assumes 1 percent of excess cost growth during 2011-60.

Share of Health Care and Long-Term Care Financing
(Percent of total spending)

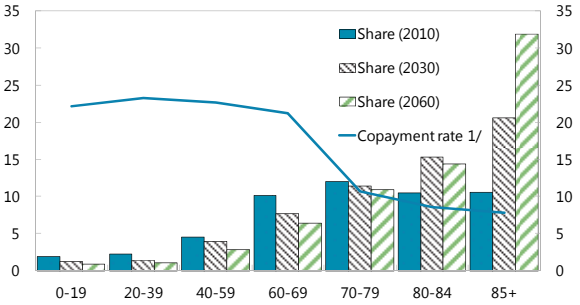


Financing of Health Care and Long-Term Care by Age Groups
(Percent of GDP)



1/ Total comprises financing from two age groups.

Distribution of Health Care Spending by Age and Copayment Rate
(In percent)



1/ Based on the ratio of average out-of-pocket to health care spending .

Sources: Authorities data; and IMF staff calculations.

12. The financing gap would rise by 3 percentage points of GDP over 2010–30. Government transfers would need to increase by 2½ percentage points of GDP for HC and ½ percentage points of GDP for LTC. To finance the gap with consumption tax increases, Japan would need to raise its rate by 6 percentage points by 2030. On a cumulative basis, the gap amounts to 33 percent of GDP over 2010–30 on a present value basis.[7]

13. Almost the whole rise of the financing gap is explained by an expected increase in HC and LTC spending on people aged 65 and above. In 2010, the spending share by people in these age cohorts accounted for 62½ percent in total. This share is expected to grow to 72½ percent in 2030 and nearly 80 percent in 2060. Yet, their contributions, including copayments and premiums, are merely 23 percent of their HC and LTC spending during 2010–60. The remaining 77 percent, which is expected to grow substantially in percent of GDP, would require funding.

D. Reform Options

14. Despite the very good health outcomes, Japan's system has some potential inefficiencies, which could be addressed to generate cost savings (Figure 4). In particular:

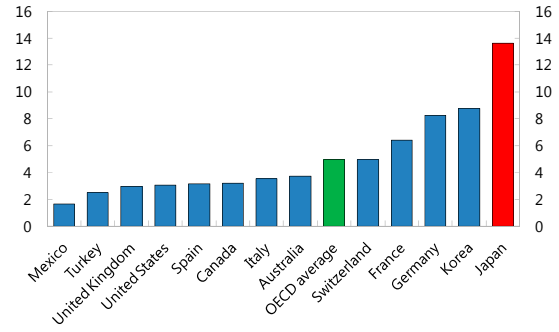
- Japan has by far the largest number of beds per capita and longest average hospitalization days among the OECD countries. According to the OECD, the number of beds per 1,000 population is 13.6 and average length of stay is 18.2 days in Japan while the OECD average (the highest 5 other OECD countries' average) is 4.9 (7.8) and 7.1 (10.6), respectively. This may be partly a result of very low copayment rate beyond the monthly cap on out-of-pocket payments and relatively limited usage of DRG (diagnosis-related group) -based reimbursements.
- Japan also has by far the largest number of CT scanners and MRI units per capita, while it is among the least advanced in using generics. Japan has 130 and 40 percent more CT and MRI per population than the second highest country in OECD, and 4.3 and 3.5 times more than the OECD average, respectively. Possible reasons behind this include the low usage of DRG-based reimbursements and conflicting responsibilities over patient care among neighboring hospitals.[8] In addition, according to the IMS Health (Sheppard, 2010), Japan's utilization of generic medicines in the off-patent market is 24 percent in 2009, while it is 89, 75, and 71 percent in the U.S., Germany, and the U.K., respectively. Further incentivizing and advertizing the usage of generics should be pursued**.**

[7] Based on the discount rate of 1 percent.

[8] The government is aware of necessity of achieving division of labor among hospitals. For example, the government introduced the system by which higher unit prices are disbursed to hospitals with high doctor to inpatient ratio in 2006. Given the rapid increase in the number of hospitals with higher ratio (almost 8-fold), this financial incentive may not be working.

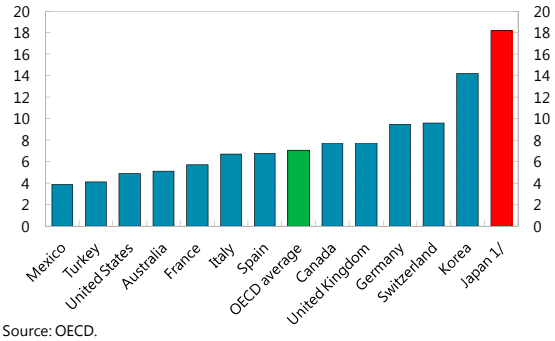
Figure 4. Reform Options

Total Hospital Beds
(Per 1,000 population)



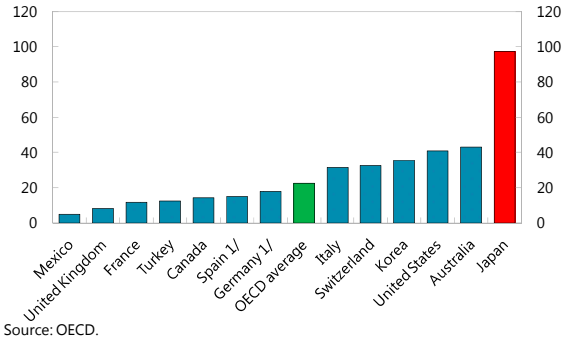
Source: OECD.

Average Length of Stay
(All causes, days)



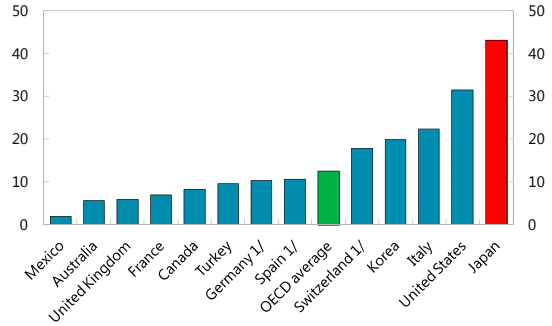
Source: OECD.
1/ Excludes long-term care beds in hospitals.

CT Scanners
(Per million population)



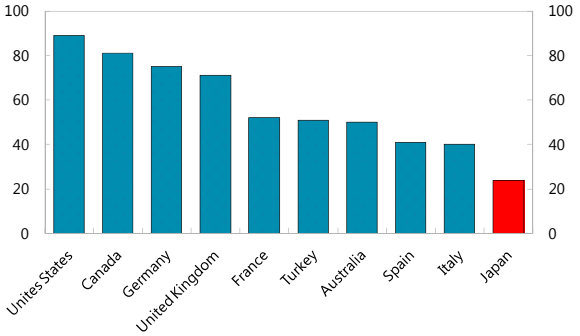
Source: OECD.
1/ Includes equipment in hospital only.

MRI Units
(Per million population)



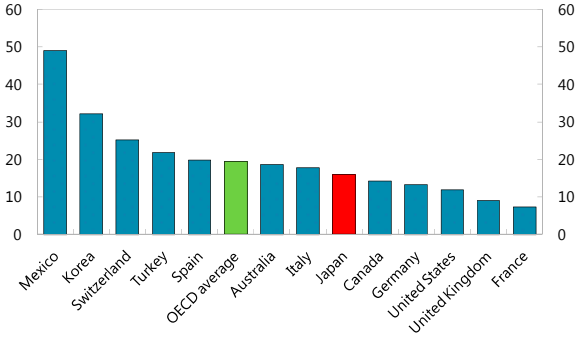
Source: OECD.
1/ Includes equipment in hospital only.

Utilization of Generic Medicines
(Percent, off-patent market)



Source: IMS.

Out-of-Pocket Payments
(Percent of total expenditure on health)



Source: OECD.

15. Cost savings from addressing these issues could amount to 0.6 percent of GDP in 2030. Based on the research by the OECD (Paris, Devaux, and Wei, 2010) and the IMF (Clements, Coady, and Gupta, 2012), improving Japan's scores in "supply constraint" and "gatekeeping" to the OECD average level could save the government 0.35 percent of GDP in 2030. Also, the authorities' estimate suggests that increasing the generic share in the unprotected market to 100 percent could save 0.27 percent of GDP.

16. Raising copayment rates would produce a double dividend of increasing revenue and reducing excess demand. Raising effective copayment rates by 5 percentage points for people aged 70 and older in the HC system[9] and for all users in the LTC system could add revenue of 0.8 percent of GDP in 2030. In addition, increasing copayment rates on expenses above the monthly cap and that for medical services provided under the welfare program may be worth examining. Higher out-of-pocket payments would also contribute to reducing excessive demand, but may need to be accompanied by means-testing.

17. Collecting contributions from dependent spouses could increase revenue and reduce disincentives for second earners to work. Under the current system, dependent spouses of employees are exempted from paying premiums if their annual earnings are below 1.3 million yen. This creates disincentives to work beyond this threshold. Moreover, this special treatment of dependent spouses may be unfair vis-à-vis couples with both earnings beyond the threshold and those insured by the NHIP. Collecting contributions from dependent spouses equivalent to the amount of benefits received (for age 64 and below) could add revenue of 0.31 percent of GDP in 2030.

18. These options would add up to total savings of 1.8 percent of GDP in 2030 (text table), only partly offsetting the projected increase in government transfer of 3 percent of GDP. Given the already high fiscal adjustment need, Japan may need more drastic reforms to contain the impact of aging and cost growth (ECG>0). These could include further increases in copayment rates and a review of government-controlled prices of HC and LTC services.

[9] Copayment rate for ages 70–74 is temporarily reduced from 20 percent to 10 percent, which costs 0.1 percent of GDP according to the government.

Reform Options to Rationalize and Limit Public Expenditure on Health and Long-Term Care

Measures	Savings for public expenditure (In percent of GDP, year 2030)			
	IMF	Authorities 1/	OECD 2/	IMF (2012) 3/
Options to rationalize expenditure				
Health care 4/				
Budget constraint			√	(0.16)
Supply constraints	0.13		√	(0.13)
Gatekeeping 5/	0.22	0.46	√	(0.22)
Over-the-basic coverage			√	(0.18)
User information			√	
Coordination among governments			√	
Usage of generics	0.27	(√)		
Long-term care				
Focus on prevention	0.14	0.12		
Options to limit public expenditure: increasing copayments and premiums				
Copayments (HC)	0.65 6/		√	
Copayments (LTC)	0.13			
Premiums (HC and LTC)	0.31			
Total savings (percent of GDP)	1.8	0.6	1.0	(0.7)

1/ Amounts in FY2025. Although the government plans to increase spending on net, these figures refer to gross savings.

2/ Total savings is staff's estimate based on OECD (2012)'s projections in 2017.

3/ Authors' calculation based on the paper's results.

4/ Category of measures is based on IMF (2012).

5/ Authorities plan to shorten hospitalization days and optimize the number of doctor visits. Based on their estimate, reducing hospitalization days to OECD average would produce saving of 1 percent of GDP (0.5 percent in the case of reducing days to the average of five OECD countries with longest days except Japan).

6/ Only includes an increase of 5 percentage points in effective copayment rates for 70 and over. Copayment rates for expenses above the monthly cap and for the welfare program could be increased.

Appendix

Decomposition of Health Spending Increases

The ratio of health care and long-term care spending (G_t) to GDP (Y_t) is equal to

$$g_t \equiv \frac{G_t}{Y_t} = \frac{\sum G_{it}}{Y_t} = \left(\frac{G_{1t}/N_{1t}}{Y_t/N_t}\right)\sum_i \left(\frac{G_{it}/N_{it}}{G_{1t}/N_{1t}}\right)\left(\frac{N_{it}}{N_t}\right) = e_t \sum_i h_{it}\, n_{it}$$

where

e_t: ratio of per capita health spending of a benchmark age cohort (age 36–40) to GDP per capita

h_{it}: per capita health spending of age cohort i relative to that of the benchmark age cohort (age 36–40)

n_{it}: population share of age cohort i, i.e., the ratio of population of age cohort i (N_{it}) to total population (N_t).

Let a "hat" represent the percent change of a variable (i.e., $\hat{x}_{t+k} = \frac{x_{t+k}-x_t}{x_t}$). Then, the percent change in the ratio of health spending to GDP ($\hat{g}_{t+k}$) is decomposed into four components: excess cost growth, healthy aging, pure aging, and residual (which should be much smaller than the rest):

$$\hat{g}_{t+k} = (1+\hat{e}_{t+k})\frac{\sum h_{i,t+k} n_{i,t+k}}{\sum h_{it} n_{it}} - 1 = (1+\hat{e}_{t+k})\Sigma_i w_i \left(1+\hat{h}_{i,t+k}\right)\left(1+\hat{n}_{i,t+k}\right) - 1$$

$$= \underbrace{\hat{e}_{t+k}}_{ECG} + \underbrace{\Sigma_i w_i \hat{h}_{i,t+k}}_{\text{Healthy aging}} + \underbrace{\Sigma_i w_i \hat{n}_{i,t+k}}_{\text{Pure aging}} + \text{residual}$$

where weight, $w_{it} = \frac{h_{it} n_{it}}{\sum h_{it} n_{it}}$.

In other words:

- The health spending ratio increases as a result of excess cost growth (ECG), that is, per capita health spending (of the benchmark age cohort) rises relative to GDP per capita.
- The spending ratio is affected by a change in the profile of per capita health spending over age cohorts. For example, the spending ratio declines if healthy aging occurs, that is, per capita spending of the elderly declines relative to the young as the elderly become healthier over time.
- The spending ratio increases as the population ages because the elderly spends much more than the young. The third term is the effect of "pure aging," in the sense that the effect of healthy aging is stripped off.

To decompose the past increase in the spending ratio, we use data on spending and population by age cohort (G_{it} and N_{it}, respectively), for health care and long-term care separately.[18]

Health Spending Projections

Health care and long-term care spending is projected from the base of 2010 through 2060, with the following assumptions:

- The ECG component e_{it} increases at a fixed annual rate for the projection period (0 percent, 1 percent, or 2 percent).
- The profile of per capita health spending over age cohorts h_{it} is fixed at 2010 levels and unchanged for the projection period.
- The population share by age cohort (n_{it}) is calculated from population projections by the National Institute of Population and Social Security Research (January 2012), under the medium-mortality and medium-fertility scenario.[19]

[18] Health care spending by age cohort (G_{it}) is available for 5-year age cohorts for 1998–2010. Long-term care spending by age cohort is available only for age 40–64 as well as age 65 and older (no spending for age 0–39 for which long-term health care insurance is not applicable).

[19] http://www.ipss.go.jp/site-ad/index_english/esuikei/gh2401e.asp.

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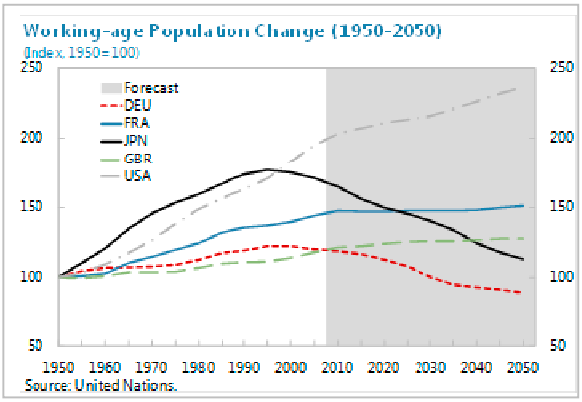
IS AGING DEFLATIONARY?[1]

Japan has the most rapidly aging population in the world. This has implications for growth and fiscal sustainability, but the potential impact on inflation has been studied less. We use the IMF's Global Integrated Fiscal and Monetary Model (GIMF) and find substantial deflationary pressures from aging, mainly from declining growth and falling land prices. Dissaving by the elderly supports aggregate demand, but also leads to real exchange rate appreciation from the repatriation of foreign assets. The deflationary effects from aging are magnified by the large fiscal consolidation need. A combination of, structural reforms, aggressive monetary easing, and fiscal consolidation can however offset these deflationary pressures, by raising inflation expectations and supporting growth.

A. Introduction

1. Japan is aging rapidly. Large gains in longevity and virtually no immigration imply "aging in fast forward." Life expectancy is the highest in the world and baby boom generations (born in 1947–49) have started retiring in 2007. As noted in IMF (2012), the old-age population will continue to increase disproportionately in coming years, while the fertility rate declined markedly during the past decades. Some of the other advanced economies, as well as countries in the region, such as Korea and China will likewise experience pressures from the demographic transition in the near future.

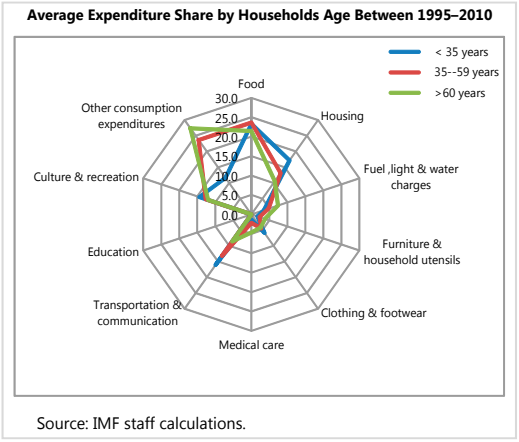


2. We analyze whether aging can be deflationary. The impact of population aging on growth and debt sustainability has been actively studied. However, the potential effects on inflation dynamics and the implications for monetary, fiscal, and structural policies have received considerably less attention. The extent to which structural factors affect inflation dynamics is a particularly pertinent question at this juncture as the country aims to emerge from deflation and revitalize the economy through comprehensive reforms.

B. Potential Effects of Aging on Inflation

3. Population aging could affect inflation dynamics by affecting relative prices, the output gap, and potential growth among other channels. In particular, deflationary pressures could arise from:

- **Changes in relative prices, including from land.** A shrinking or aging population would lower the price of land (for example, because the elderly live in smaller houses). Land is not only a fixed factor of



Source: IMF staff calculations.

[1] Prepared by Dennis Botman (APD), Derek Anderson and Ben Hunt (both RES).

production, but also affects wealth and thereby consumer behavior. A decline in labor force participation affects real wages. The extent to which relative price changes occur between land, labor, and capital will depend partly on labor market characteristics—in Japan, wage growth has lagged productivity growth despite declining labor force participation and the absence of immigration. In addition, aging leads to secular shifts in consumption patterns as the elderly's preferences differ from the young with less spending on housing, transportation and communication, and education and more spending on medical, utilities, and other consumption expenditures as the population ages (text chart). To what extent this shift affects inflation dynamics depends on the flexibility of supply to adapt to these changes. In turn, this may be affected by the extent to which there may be substitution from market to regulated prices, although this will be difficult to capture empirically.

- **Widening output gap from fiscal pressures.** In many countries, advanced and emerging economies alike, aging will lead to higher government outlays on pensions and health care and a shrinking tax base. Coupled with elevated initial deficit and debt levels, the expectation of a rising risk premium or fiscal consolidation would lead to a sustained period of output growth below potential and deflationary pressures. In contrast, unsustainable government debt dynamics could increase inflation expectations in the absence of a credible medium-term fiscal consolidation plan. It should be noted though that projections for aging-related expenditures appear relatively modest in Japan—although new work suggests that health care spending could rise faster than previously expected (Kashiwase, Nozaki, and Saito, 2013)—and hence the fiscal channel will be driven mainly by the weak initial position.
- **Declining potential growth and private savings dynamics.** Declining labor force participation rates and life-cycle savings effects could contribute to growth being below potential, or to potential growth declining. On the former, expectations of slowing demand in the future could lead firms to reduce investment today, leading to a widening output gap during the transition phase.
- **Life-cycle savings considerations** could have wealth implications by affecting asset prices, including the exchange rate following repatriation of foreign investments. Most likely, these effects on potential growth and asset prices could affect prices of traded and nontraded goods differently, with the effect presumably more pronounced on the latter.
- **The composition of government spending** will likely change as a result of population aging, possibly resulting in greater redistribution from young to older cohorts and therefore toward transfers from current and public investment, which could affect potential growth output and inflation dynamics.
- **Changes in policy objectives affected by political economy considerations.** Young cohorts do not initially have any assets, and wages are their main source of income; they prefer relatively low real interest rates, relatively high wages, and relatively high rates of inflation. Older generations work less and prefer higher rates of return from their savings, relatively low wages, and relatively low inflation (Bullard, Garriga, and Waller, 2012). The latter will depend on institutional factors, for example the extent of pension indexation. As such, aging could affect the objective function of a central bank, with a lower weight attached to inflation. In contrast,

Japan has recently adopted a higher inflation target to be achieved through aggressive quantitative and qualitative monetary easing, to some extent defying the political economy hypothesis, or at least suggesting that this can be trumped by other economic considerations if the country has been stuck in deflation.

C. A Model-Based Evaluation

4. We use the IMF's Global Integrated Monetary and Fiscal (GIMF) model to quantify some of these channels and analyze policy options. In the confinements of GIMF, we are not able to capture all of the channels above. Specifically, changes in consumption patterns and political economy considerations are not included in the simulations. We have extended GIMF to include land, as a factor of production, a source of wealth, and consumption good. Since GIMF does not allow for an explicit incorporation of retirement decisions we impose the decline in labor force participation based on the UN's demographic projections. Likewise, the extent to which retirees dissave is imposed in the model and the decline in the ratio of private savings to GDP is assumed to be about 3.5 percentage points between 2012–40, similar to Hoshi and Ito (2012) where aggregate savings to GDP decline from about 2.8 percent in 2012 to about −1.3 percent in 2040.

5. The model has some limitations. In principle, monetary policy will react endogenously to any effects of aging on inflation consistent with the central bank's objective function, although there remains the open issue to what extent this will be effective under the zero-lower bound. Therefore, to isolate the effect of aging on inflation one would need to keep monetary policy constant. However, this can only be imposed in GIMF for a few periods as otherwise the model would become unstable. As such, any deflationary effects from aging will be observed in the simulations through both the policy rate and the inflation rate.

6. We find that aging is deflationary through lower labor force participation and declining land prices, real exchange rate appreciation, and a gradually rising sovereign risk premium as private savings decline (Figure 1).

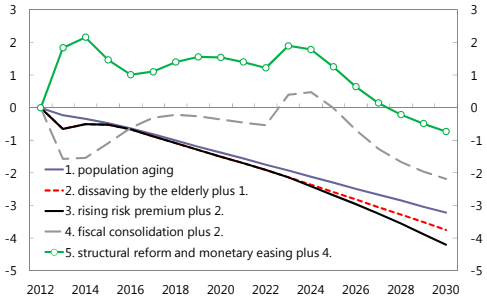
- **Population aging exerts deflationary pressures.** Real GDP contracts as the labor force shrinks. Land prices continue their slide, putting further downward pressure on inflation, both directly and indirectly by lower production costs. Without a more aggressive policy rule, despite a reduction in the "shadow" policy rate of about 20 basis points, inflation falls by about 10 basis points. Government debt increases due to the fall in nominal GDP.
- **Dissaving by the elderly exerts further deflationary pressures through real exchange rate appreciation.** Interestingly, one might suspect that dissaving by retirees would be inflationary: as aggregate supply declines, aggregate demand remains supported, as can be observed in panel 2 of Figure 1. However, repatriation of foreign savings leads to real exchange rate appreciation, more than offsetting this channel.
- **A rising risk premium adds further deflationary pressures.** As private savings start to fall, while the government financing requirement remains high, the government needs to increasingly tap foreign investors leading to higher government bond yields. The combined effect leads to a decline in inflation of about 30 basis points on average between 2013–30 despite a decline in the "shadow" policy rate of about 60 basis points on average during the same period.

Figure 1. Effects of Aging and Macroeconomic Policies on Selected Macroeconomic Variable

(Percent deviation from initial steady state unless otherwise noted)

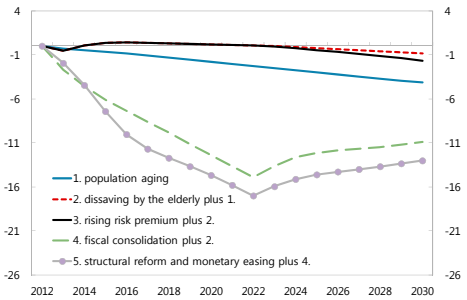
Real GDP

(In percent)



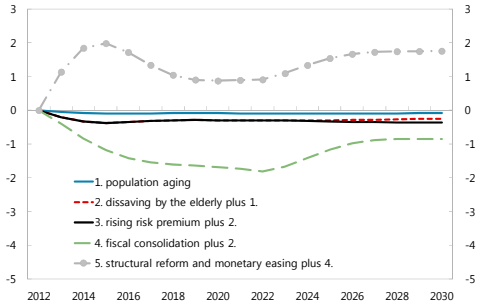
Real Consumption

(In percent)



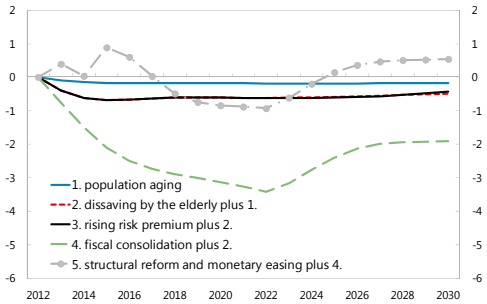
Inflation

(Deviation from 2012 annual average, percentage points)



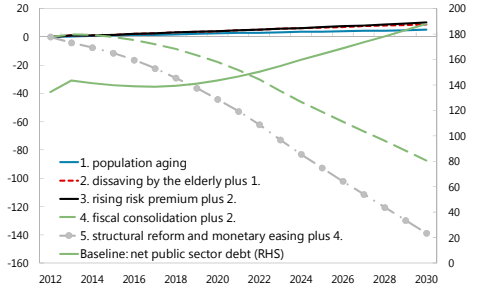
"Shadow" Policy Rate

(Percentage points)



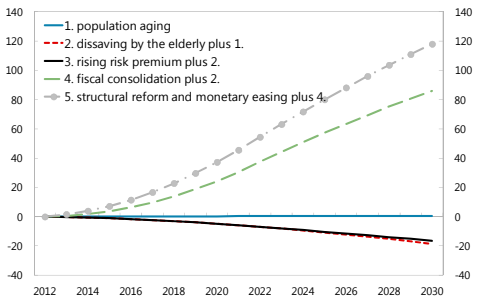
Government Debt-to-GDP Ratio

(Percentage points of GDP)



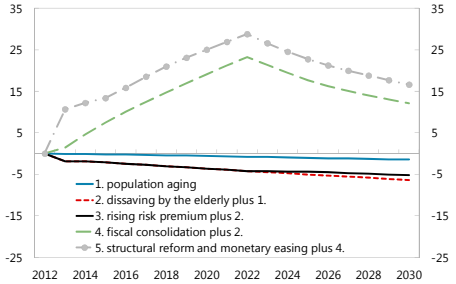
Net Foreign Assets-to-GDP Ratio

(Percentage points of GDP)



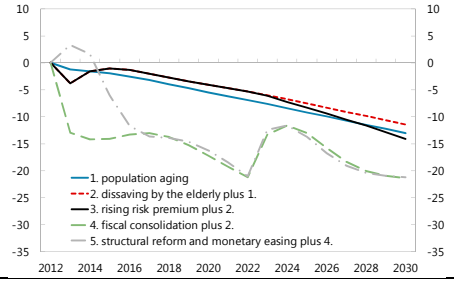
Real Exchange Rate (+ is depreciation)

(In percent)



Land Prices

(In percent)



7. A bold package of reforms that includes fiscal consolidation, structural reforms, and aggressive monetary easing can overcome these deflationary pressures.

- Fiscal consolidation by itself further adds significant deflationary pressures, more than those from aging. As mentioned, unlike other advanced economies, aging does not exert significant fiscal pressures in Japan. In contrast, the fiscal consolidation needs stem from the high initial debt and deficit levels, with rising social security benefits and health care spending adding only modest further pressures over the medium term. To put debt on a downward trajectory relative to the baseline, it is assumed that 1 percent of GDP fiscal consolidation takes place for each year during 2015–20 through a mix of higher consumption taxes and cuts in government spending. Even though this would avoid the rise in the risk premium, consumption and land prices decline markedly, exerting downward pressure on the "shadow" policy rate[2] and inflation. Fiscal consolidation more than offsets the decline in private savings leading to further accumulation of net foreign assets. This channel may also be relevant for other countries that experience medium- to long-term fiscal pressures, even if the labor force participation rate remains relatively unchanged.
- Combining fiscal consolidation with structural reforms and aggressive monetary easing to achieve the new inflation target can offset the effects of aging. In the simulation, it is assumed that structural reforms raise potential growth by 25 basis points by 2015 and by 50 basis points by 2018. In combination with a credible adoption of the 2 percent inflation target, pursued by aggressive monetary easing, such a policy package has substantial benefits by overcoming the deflationary effects of aging, while supporting growth and fiscal sustainability.

D. Conclusions

8. Although aging tends to exert deflationary pressures, these can be overcome with a full package of reforms that include medium-term fiscal consolidation, structural reforms, and aggressive monetary easing. Such a package generates powerful economic synergies. Given aging pressures, monetary policy will likely have to stay accommodative for an extended period of time, although the extent to which this is the case depends critically on the credibility of the central bank's policy rule. Measures that directly address the effects of population aging are likely to be most effective. These include stimulating labor force participation by females and the elderly as well as greater options for immigration.

[2] The "shadow" policy rate is defined as the rate that would be observed in the absence of the zero-lower bound.

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THE PATH TO HIGHER GROWTH: DOES REVAMPING JAPAN'S DUAL LABOR MARKET MATTER?[1]

This paper discusses causes and economic consequences of Japan's dual labor market, as well as options for reform. The paper argues that Japan's excessive labor duality reduces Total Factor Productivity (TFP), due to a negative impact on non-regular workers effort and on firms' incentives to train them. Based on an empirical analysis of the determinants of labor market duality for a panel of OECD countries, the paper argues that reforms aimed at reducing the difference in the degree of employment protection between regular and non-regular workers could significantly reduce duality in Japan, thus stimulating TFP and growth.

A. Introduction and Main Findings

1. Labor market duality forcefully emerged in Japan in the last two decades, as declining growth challenged the traditional lifetime employment model. After serving the country well in high-growth decades, Japan's traditional lifetime employment system was challenged by declining growth in the wake of the asset bubble collapse in the early 1990s, which led to Japan's so called "lost decade." The prolonged recession, together with labor law reforms—which made it easier to hire non-regular workers—gave firms incentives to explore alternative human resource practices. As a result, a growing share of non-regular workers were removed from the traditional lifetime employment model, which nonetheless continues to be widespread even in present days among regular workers.

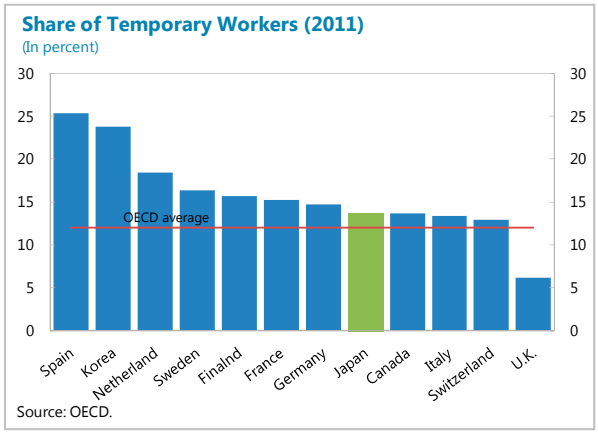
2. This paper focuses on trends, causes and economic consequences of Japan's dual labor market, and suggests options for reform. The paper argues that excessive duality can reduce total factor productivity (TFP) due to its negative impact on non-regular workers effort and on firms' incentives to train them. Excessive duality can also reduce social cohesion and lead to the perception that economic growth is not inclusive, thus potentially eroding support for needed structural reforms. On the basis of cross-country panel estimation, the paper argues that one option to reduce duality in Japan could be the introduction of a Single Open Ended Contract (SOEC) for all new hires, in which employment protection increases with tenure. This reform could be accompanied by a more general shift toward the so-called "flexicurity" model, in which the focus is on providing lifelong employment opportunities and supporting workers during periods of temporary unemployment, rather than on protecting specific jobs. For the proposed package of reforms to work, a change in "soft institutions"—aimed at improving the work-life balance—would also help.

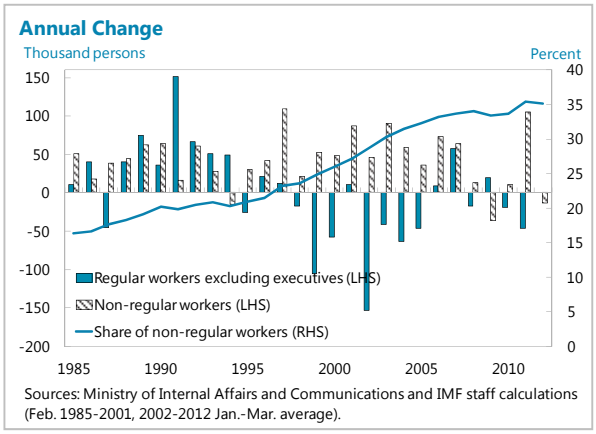
B. Japan's Labor Market Duality: Trends and Economic Costs

3. The share of non-regular workers in Japan, which was below 20 percent before the burst of the bubble in the early 1990s, has now reached 35 percent. Compared to regular workers, non-regular workers have a much lower level of job security, are paid lower wages and receive significantly less social insurance coverage. About 70 percent of non-regular workers are women, accounting for 55 percent of female workers. Low-value added service sectors are highly

[1] Prepared by Chie Aoyagi and Giovanni Ganelli (both OAP).

reliant on non-regular employment. Japan's share of temporary workers—the only proxy of labor market duality available for international comparisons—is above the OECD average (text chart).





4. Recent studies and international experience suggest that the macroeconomic costs of excessive labor market duality are likely to be substantial in Japan. Japan's large labor market duality likely reduces productivity and growth, by lowering firms' incentives to train non-regular workers, and through reduced workers' incentive to exert effort due to low job satisfaction (Fukao and others, 2007; Kawaguchi and others, 2006). Cross-country empirical studies also suggest that excessive labor market duality can reduce TFP (Dolado, Ortigueira, and Stucchi, 2011; Damiani, Pompei, and Ricci, 2011). Excessive duality in Japan could also potentially lead to the perception that economic growth is not inclusive, thus eroding support for structural reforms needed to increase potential growth. In light of this, next section will look at empirical determinants of labor market duality, with the aim of identifying policy options to reform Japan's labor market.

C. Determinants of Labor Market Duality

5. Various factors have been highlighted in the literature as contributing to the surge of non-regular employment in Japan. Asano, Ito, and Kawaguchi (2011) estimate that demographic changes and shifts in the industrial structure explain about one quarter of the increase in non-regular employment since the mid-1980s. A more detailed list of factors include:

- **The increase in female labor-force participation** and the consequent demand for flexible work schedules (Gaston and Kishi, 2007; Asano, Ito, and Kawaguchi, 2011).
- **A shift from manufacturing to services**, because the service sector requires more flexible staffing to accommodate demand fluctuations (Asano, Ito, and Kawaguchi, 2011).
- **Economic globalization**. As documented by Machikita and Sato (2011) using manufacturing firm-level data, outward FDIs and outsourcing are important determinants of the increase of non-regular work in Japan.
- **The high level of employment protection of regular workers.** Japan's laws are not particularly restrictive in the case of fair dismissals, which are allowed with a 30-day notice period on the basis of incompetence of the employee, violation of disciplinary rules and for economic reasons, and do not oblige companies to provide severance pay. However, as stressed for example by Tsuru (2012), the legal doctrine on unfair dismissal is amongst the strictest in the OECD and

orders of reinstatement with back pay are frequent. Anecdotal evidence suggests that in Japan courts apply stricter standards for dismissals of regular workers compared to non-regular ones, and that firms try to avoid dismissals of regular workers by reaching voluntary agreements, which include severance packages (Asano, Ito, and Kawaguchi, 2011; The Nikkei Weekly, 2012).

6. In this paper, we assess the impact of various determinants of labor market duality by estimating a structural model for a panel of OECD countries. The dependent variable is the share of temporary workers in the labor force, which is regressed on variables which we expect to impact the size of labor market duality, such as institutional and demographic factors and relevant macroeconomic control variables. Our regressors, which include proxies of the determinants listed in paragraph 5, are (i) OECD's indexes of the strictness of employment protection legislation for both regular and temporary workers; (ii) FDI outflows as a ratio to GDP; (iii) the share of employment in services; (iv) the share of female labor participation; (v) union density; (vi) the unemployment rate; (vii) inflation; (viii) the output gap; (ix) government spending on vocational training as a ratio to GDP. We also control for country fixed effects and we include a lag of the dependent variable to allow for autocorrelation.

7. Our results suggest that a higher level of employment protection of regular workers increases labor market duality, while a higher level of protection of temporary workers reduces it. Table 1 shows that the sign of the coefficient on the employment protection index for regular employees (EPR) is positive and statistically significant, meaning that high employment protection for this category of workers increases our proxy of labor market duality (the share of temporary workers). On the other hand, the negative and significant sign on the employment protection index for temporary employees (EPT) implies that increased protection of temporary workers tends to reduce labor market duality. Alternative model specifications and robustness checks, not reported here for brevity, confirm these findings.

8. Several other institutional, demographic and macroeconomic factors have an impact on the degree of labor market duality. FDI outflows and female labor participation have the expected positive sign—that is to increase temporary employment— and the latter is also significant. The coefficient on the share of employment in services is negative and significant, thus contradicting the findings by Asano, Ito, and Kawaguchi (2011) for Japan. The unemployment rate has a positive impact on duality, suggesting that higher levels of unemployment make it easier for firms to impose temporary contracts on workers. Union density has a negative and significant impact on duality, suggesting that stronger union influence makes it difficult to impose temporary contracts. Inflation has a negative and significant impact. One explanation for this result is that workers could be less motivated to seek employment in better-paid regular jobs when inflation is low. The negative (albeit not significant) coefficient on government spending for vocational training suggests that this kind of policy can reduce duality.

Table 1. Determinants of Labor Market Duality in a Panel of OECD Countries: Regression Results 1/

	Benchmark model 2/	Benchmark model 3/	Benchmark model 4/
Dependent Variable: Share of Temporary Workers			
Employment Protection Legislation of Regular Workers	0.763	0.763	0.768
	[2.23]**	[2.8]**	[2.38]**
Employment Protection Legislation of Temporary Workers	-0.281	-0.281	-0.251
	[-2.47]**	[-3.05]***	[-2.18]**
FDI Outflows (percent of GDP)	0.010	0.010	0.010
	[0.72]	[1.21]	[0.85]
Female Labor Participation	0.094	0.094	0.105
	[3.10]***	[2.33]**	[3.33]***
Share of Employment in Services	-0.192	-0.192	-0.193
	[-5.51]***	[-2.04]*	[-6.00]***
Union Density	-0.096	-0.096	-0.096
	[-2.86]***	[-1.86]*	[-2.96]***
Unemployment Rate	0.110	0.110	0.115
	[2.81]***	[1.68]	[3.17]***
Inflation	-0.230	-0.230	-0.215
	[-5.19]***	[-2.45]**	[-5.19]***
Output Gap	0.006	0.006	0.005
	[0.16]	[0.12]	[0.15]
Government Spending on Vocational Training (percent of GDP)	-0.469	-0.469	-0.671
	[-0.82]	[-0.97]	[-1.18]
Lagged Dependent Variable	0.825	0.825	0.823
	[26.5]***	[40.58]***	[26.45]***
R-squared	0.857	0.857	…

Source: IMF staff calculations.

1/ T-statistics are reported in parenthesis. * denotes significance at 10% level, ** significance at 5% level, and *** significance at 1% level. Countries included in the panel are Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom. Annual data from OECD and the World Bank for 1985-2010 (or less, depending on availability) are used. A Hausman test rejected the null hypothesis that a random effects model would be statistically different from a fixed effects one.
2/ Fixed effects estimation with default standard errors.
3/ Fixed effects estimation with clustered standard errors.
4/ Arellano-Bond estimation with one lag.

9. Reducing the difference in employment protection between regular and non-regular workers is key to reduce Japan's labor market duality. In order to estimate how changes in employment protection would affect the overall share of non-regular workers we have followed a two-step procedure. First, we have used the coefficients estimated in the benchmark model (Table 1) to assess the impact of changes in EPT and EPR on the share of temporary workers. We have then estimated how a change in the latter would translate into a change in the overall share of non-

regular workers on the basis of a bilateral OLS regression carried on using data for Japan for 1984–2011.

10. The estimated impact of changes in labor employment protection on the share of non-regular workers in Japan is sizeable. Our results show that if, for example, EPR was reduced from Japan's level of 1.9 to Denmark's level of 1.6, and the share of non-regular workers in Japan could be reduced from the 2012 level of 35.1 percent to close to 31 percent (text table). The estimated reduction could be even larger for more radical reforms. For example, if EPR was reduced from its current level to the UK's level of 1.1, the share of non-regular workers could drop below 30 percent. These estimates are based only on ceteris paribus first-round effects. If the reduction in labor market duality results in higher growth, this would reduce unemployment and help exiting deflation. Given the coefficients on unemployment and inflation in the panel regression (Table 1), there could be a second round effect of the reforms which could further reduce duality. An important caveat of this analysis is that the share of temporary workers is not a perfect proxy of labor market duality, because it does not include all non-regular workers. The two-step procedure that we have followed could therefore bias our results upward—in the sense of overestimating the reduction in the share of non-regulars—if the bilateral regression that we carried out for Japan captures correlation rather than causality.

Estimated Impact of Changes in EPT and EPR on Share on Regular Workers

Share of non-regular workers in Japan in 2012 (EPR=1.9; EPT=1)	Share if: EPR from 1.9 to 1.5.; EPT from 1 to 1.5	Share if: EPR from 1.9 to 1.6 (Denmark's level); EPT unchanged at 1	Share if: EPR from 1.9 to 1.1 (UK's level); EPT unchanged	Share if: EPR from 1.9 to 1; EPT unchanged at 1
35.1	30.4	31.3	29.8	29.5

Source: IMF staff calculations.

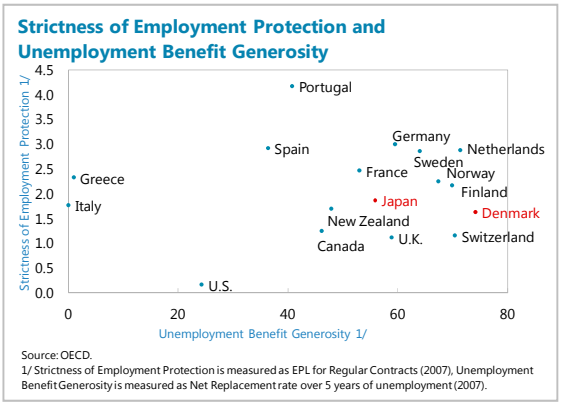
D. Options for Labor Market Reform in Japan

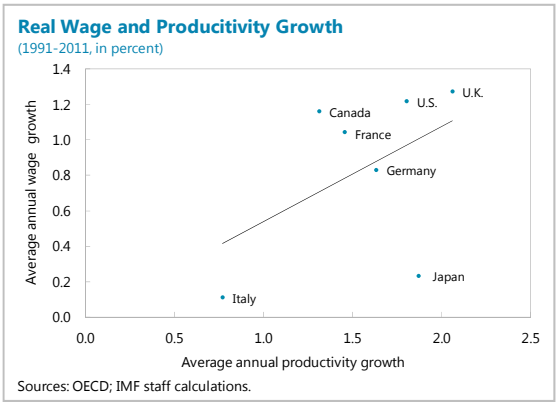
11. In light of our empirical results, one option that could help reduce labor market duality in Japan could be replacing regular and non-regular contracts currently offered to new hires with a Single Open Ended Contract (SOEC). Under the SOEC employment protection would increase gradually and severance pay would rise with tenure. Introducing a SOEC would therefore drastically reduce firms' marginal costs of converting non-regular to regular positions. The SOEC would imply lower job security at initial stages compared to current regular employment, but higher job security compared to current non-regular employment. According to the empirical results discussed above, a move in this direction would reduce duality. Introduction of a SOEC could be complemented by other measures aimed at reducing duality while also helping build consensus for the reform package. Another useful reform would be giving workers the right to choose between part-time and full-time work (after a certain tenure period) while maintaining the same hourly wage and legal rights. This would reduce incentives for employers to favor full-time workers to part-time workers in terms of training, because any full-time worker might at any point in time decide to switch to part-time (and vice versa).

12. A possible first step to implement the recommendations given in this paper could be a wider use of limited regular ("gentei seishain") contracts. Employees who are classified as limited regular workers still enjoy regular workers status and benefits, but with limitations on one or

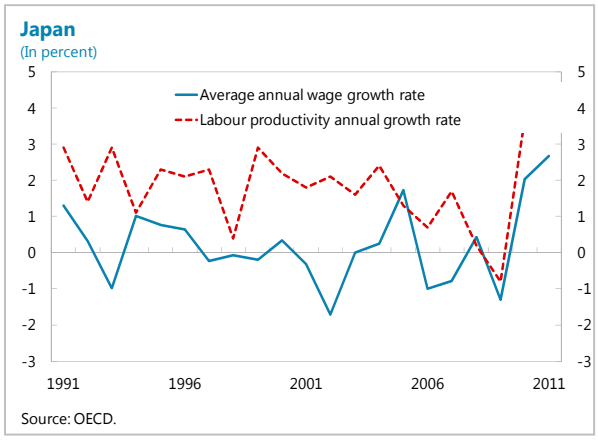
more of the following: (i) job content; (ii) working hours; and (iii) mandatory relocations. Discussions in governmental committees and policy seminars have recently focused on the possibility of expanding the use of this kind of contract, while at the same time clarifying the legal framework for dismissals of limited regular workers, thus reducing uncertainties for firms. A wider use of such contracts, which offer more flexible work arrangements for regular workers while at the same time preserving incentives to invest in workers and their productivity, would be consistent with the recommendations given in this paper.

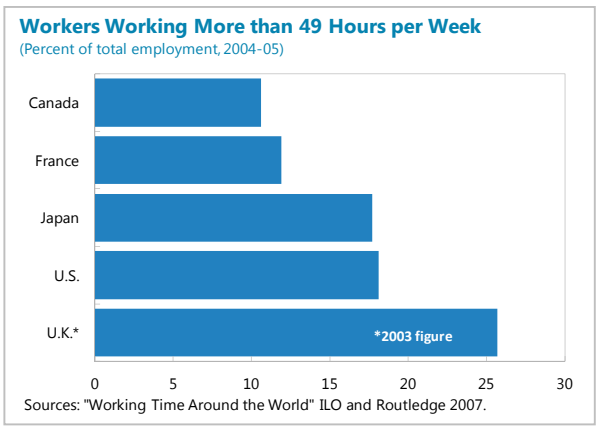
13. A move toward the so-called "flexicurity" model could also be part of the reform package. Reduced guarantees of life-time employment for regular workers could be complemented by measures aimed at encouraging more job mobility and supporting workers during periods of temporary unemployment. This would mark a shift away from the current Japanese labor market model—characterized by excessive duality and lifetime employment for regular workers—to one more similar to the Danish "flexicurity" model, in which the focus is on protecting workers rather than jobs. One important measure in this regard would be increasing unemployment insurance benefits (text chart).



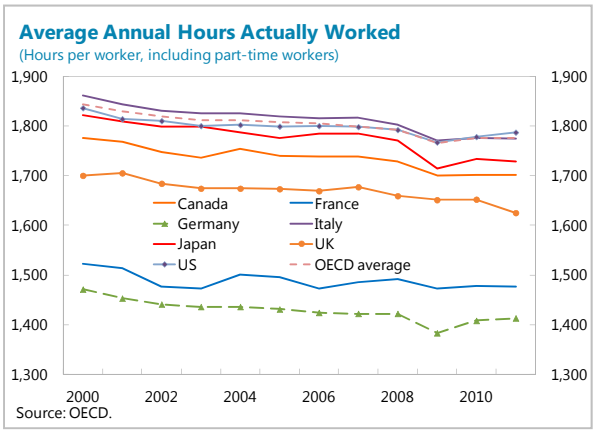


14. Policies aimed at raising wages would also facilitate acceptance of reduced employment protection for regular workers. Real wage and productivity growth trends in the last 20 years suggest that there is scope for wage increases in Japan (see text figures). Against this backdrop, the authorities have recently been using moral suasion and tax incentives to encourage companies to increase wages. Given the importance of increasing wages to exit deflation, the implementation of policies aimed at encouraging wage growth is appropriate.





15. For the proposed package of reforms to work, a change in "soft institutions" would also help. In particular, in order to make the reduction in employment protection of regular workers socially and politically acceptable, reforms to improve the work-life balance, such as increased accessibility to annual leave, the right to refuse involuntary relocations, and a reduction of overtime work could be pursued. Although an international comparison shows that Japanese workers work less than those in the U.S. and Italy (text charts), these data likely underestimate the use of overtime for regular workers in Japan because they include part-time workers. Working until very late in the night (substantially above 49 hours per week) among regular workers is very common in Japan and anecdotal evidence suggests that the problem is more serious than in most other advanced countries. One of the reasons for this is that the premium that employers have to pay for work outside statutory hours is comparatively low at 25 percent of the regular hourly wage. Overtime pay also does not count toward the earnings on the basis of which bonuses are calculated, which account for 20–30 percent of worker's annual earnings in big firms. Measures aimed at eliminating these biases in favor of intensive overtime use would help, but a voluntary change in working practices by firms ("soft institutions") would also be required.



E. Conclusions

16. This paper argues that Japan's dual labor market is likely to entail substantial economic costs. In particular, microeconomic studies and international experiences suggest that excessive labor market duality can reduce TFP due to a negative impact on non-regular workers effort and on firms' incentives to train them. Excessive duality can also have negative consequences on social cohesion in Japan, thus eroding support for needed structural reforms, which could increase potential growth.

17. On the basis of cross-country empirical evidence on the determinants of labor market duality, the paper proposes some reform options for Japan. Our empirical estimations suggest that reducing the difference in employment protection between regular and non-regular workers would substantially reduce labor market duality in Japan. One reform consistent with these findings is the introduction of an SOEC for all workers, under which employment protection would increase gradually and severance pay would rise with tenure. A SOEC would imply lower job security compared to current regular employment, but higher job security compared to current non-regular employment. A first step in this direction could be encouraging a wider use of limited regular contracts, which would allow for more employment flexibility while preserving incentives to train workers. Reforms to employment contracts would be helped by adopting complementary measures, such as a shifting toward the so-called "flexicurity" model, which supports workers instead of protecting specific jobs.

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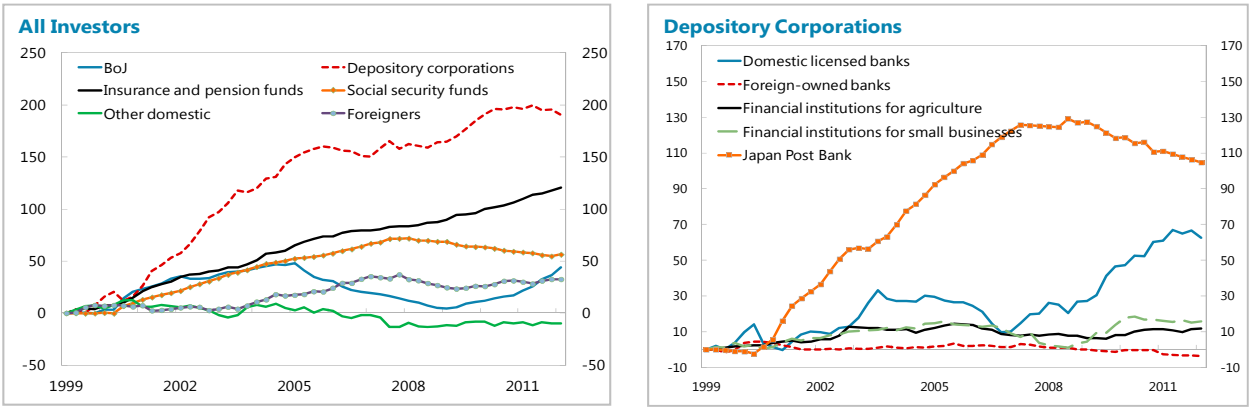
BANKING SECTOR RISKS UNDER THE GOVERNMENT'S NEW POLICIES[1]

Large sovereign exposure of Japanese banks is a key risk to financial stability. The aim of this note is to develop illustrative scenarios describing how Japanese banks' sovereign exposure—and the related exposure to interest rate risk—may change over the medium term under the authorities new policies to raise inflation and growth. Based on an approach developed in the October 2012 Global Financial Stability Report, the interest rate sensitivity of Japanese banks is assessed over the medium term for major and regional banks.[2] Under the pre-Abenomics baseline, interest rate risk exposures of banks were set to rise over the medium term, highlighting growing financial stability risks. We find that with a combination of aggressive monetary easing, ambitious structural reforms, and medium-term fiscal consolidation, such risks could decline substantially over the next two years. However, if structural and fiscal reforms disappoint and/or if inflation expectations are sluggish and further fiscal stimulus is implemented, interest risk exposures of Japanese banks could quickly rise to levels higher than in the baseline. The likelihood or severity of a sharp increase in Japanese government bond yields may also rise under incomplete policies.

A. Introduction

1. Japanese banks have traditionally been the largest buyers of Japanese government bonds (JGBs). They have purchased about 200 trillion yen of JGBs since 2000. While Japan Post Bank was the major buyer of JGBs until 2008, other domestic banks have since become the main

Cumulative Net Purchase of JGBs by Investor Type, 2000–12
(In trillion yen)



Sources: Bank of Japan Flow of Funds statistics, Japan Post Bank, and IMF staff estimates.
Notes: Depository corporations include Japan Post Bank. Insurance funds include Japan Post Insurance. Social security funds include the Government Pension Investment Fund (GPIF). Other domestic includes households and corporates. Domestically licensed banks include major and regional banks. Figures for Japan Post Bank after 2007 are estimated from company reports.

[1] Prepared by Serkan Arslanalp (MCM).

[2] The analysis is described in pages 52–55 of the October 2012 GFSR available at http://www.imf.org/external/pubs/ft/gfsr/2012/02/pdf/text.pdf

buyers. Meanwhile, insurance and pension funds have steadily increased their JGB holdings to match their long-term liabilities (at a pace of around 9 trillion yen per year), while social security funds have reduced them over the last four years to pay out retiring pensioners (at a pace of around 4 trillion yen per year). At the same time, the BoJ has become a net buyer of JGBs after the Asset Purchase Program was put in place in 2010. Since adoption of the new quantitative and qualitative monetary easing (QQME) this April, its role is likely to increase substantially.

2. From a historical perspective, Japanese banks can be thought of as the residuals buyers in the JGB market. Over the last decade, Japanese banks' cumulative net purchases of JGBs has been determined to a large extent by (i) net issuance of JGBs; (ii) social security fund net purchases of JGBs; (iii) Bank of Japan (BoJ) net purchases of JGBs; and (iv) foreign net purchases of JGBs. In fact, the following equation can explain most of the variation in Japanese banks' holdings of JGBs since 2000.

$$B_t = B_0 + D_{0,t} - SSF_{0,t} - CB_{0,t} - FOR_{0,t} - alpha*t$$

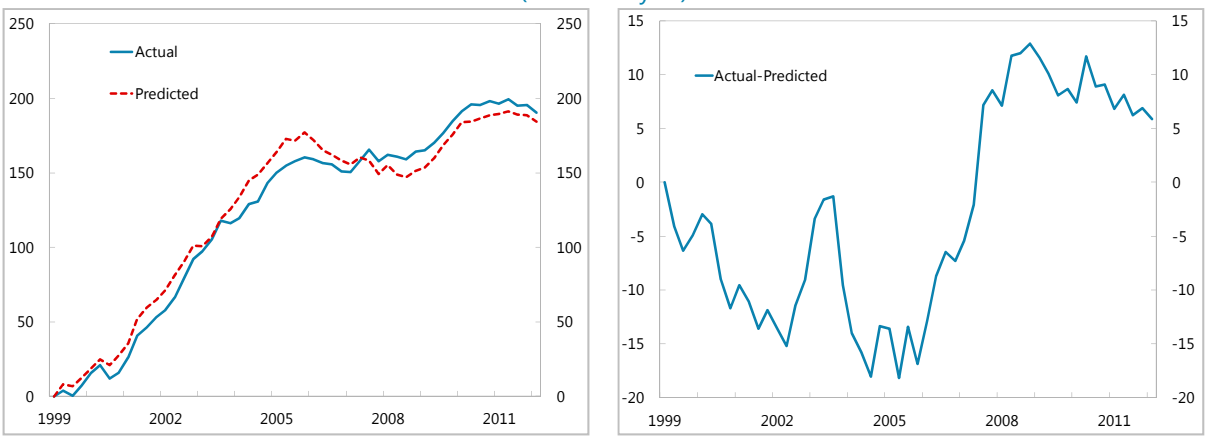
where *Bt* represent Japanese banks' JGB holdings at time *t*; *D0,t* represents the cumulative net issuance of JGBs between time *0* and *t; SSF0,t, CB0,t,* and *FOR0,t* represent the cumulative net purchase of JGBs by social security funds, BoJ, and foreigners, respectively; and, *alpha* represents a time trend that captures the secular buying of JGBs by other investors, in particular insurance and pension funds (that is., alpha is equal to 9 trillion yen). It seems unusual at first glance that the yield on JGBs does not enter this equation, but that is because the equation relies only on the supply and demand balance for JGBs. It also works because (i) Japanese insurance and pension funds have had historically stable demand for JGBs due to their asset liability matching policies and (ii) other domestic non-banks, including mutual funds, are negligible buyers of JGBs.

3. This relationship can be used to project potential JGB holdings of Japanese banks under various scenarios. The following figure shows actual and predicted cumulative net purchases of JGBs by Japanese banks since 2000, based on the equation above. A number of observations can be made. First, the relationship can explain actual purchases of JGBs by Japanese banks over a long period of time with a limited margin of error. Second, although other factors are also likely to matter, the relationship requires very little information about more general economic and financial variables. Finally, out of the four variables in the equation, two of them can be anticipated, as they are set by policy (*D* and *CB),* while the other two (*SSF* and *FOR*) can be projected based on reasonable assumptions from past trends. Hence, we use this relationship to construct the scenarios discussed in the next section.[3]

[3] One possible shortcoming of this approach is that under the new monetary policy framework, net purchases of JGBs by insurance and pension funds may change from historical trends (that is, alpha may change), as they seek new investment opportunities including foreign assets. However, their demand for JGBs is likely to remain strong, dictated by their asset-liability management investment mandates.

Actual and Predicated Cumulative Net Purchase of JGBs by Depository Corporations, 2000–12

(In trillion yen)



Source: IMF staff estimates.

Note: Predicted purchases of JGBs are based on (i) total net issuance; (ii) social security fund purchases; (iii) Bank of Japan purchases; and (iv) foreign purchases.

B. Scenario Analysis

4. This section presents illustrative scenarios to highlight how Japanese banks' sensitivity to interest rate risk may change under various scenarios. Three scenarios are considered: (i) a baseline pre-Abenomics scenario; (ii) a complete Abenomics package under which QQME, fiscal consolidation, and ambitious structural reforms lead to lower government funding needs and higher growth; and (iii) an incomplete Abenomics package under which inflation expectations adjust in a sluggish manner to QQME, possibly because of the lack of a structural reform program, requiring further fiscal stimulus to close the output gap and boost inflation in the near term. Based on these scenarios and the relationship above, Japanese banks holdings of JGBs are projected based on the assumed fiscal policy path (D), BoJ's QE announcements (CB) and assumptions on the investment behavior of social security funds (SSF) and foreigners (FOR) based on past trends. In all scenarios, the macro assumptions on growth and fiscal deficits come from the IMF's new G20MOD, which has been used to illustrate the potential benefits of complete and incomplete government policies to raise inflation and growth.

5. Based on these scenarios, Japanese banks' JGB holdings are projected for 2013–17 using the following assumptions:

- *D*. Cumulative net issuance of JGBs over the medium term is based on the change in general government gross debt. In all scenarios, general government debt is assumed to be issued as follows: 75 percent in JGBs,

Projected Net Purchases of JGBs, 2013-17

(Annual average, in trillion yen)

	Pre-Abenomics	Abenomics: complete package	Abenomics: incomplete package
Net JGB issuance	25.9	25.3	28.7
BoJ	14.7	20.0	20.0
Depository corporations	5.0	-5.5	6.9
Insurance and pension fun	9.0	9.0	9.0
Social security funds	-4.0	-4.0	-4.0
Other domestic	0.0	0.0	0.0
Foreigners	1.2	5.8	-3.3

Source: IMF staff projections.

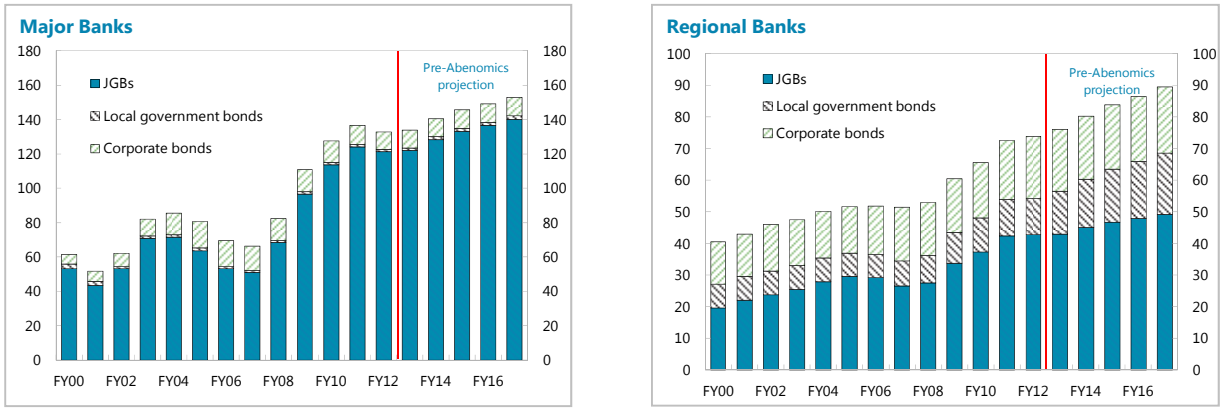
Notes: The BoJ net purchases of JGBs are 50 trillion yen each in 2013 and 2014 and zero afterwards. Net purchases by insurance and pension funds are based on historical trends. Net purchases by social security funds is based on trends in the last four years.

20 percent in treasury bills, and 5 percent in local government bonds, in line with the broad pattern of debt issuance in recent years.

- *CB*. The BoJ's net JGB purchases are projected based on the April 2013 policy announcement (50 trillion yen in 2013 and 50 trillion yen in 2014). BoJ's JGB holdings are assumed to be constant thereafter. Under the pre-Abenomics scenario, BoJ's JGB purchases are projected based on the Open-Ended Asset Purchasing Method introduced in January 2013.
- *SSF*. Social security funds are assumed to remain net sellers of JGBs under current demographic trends by 4 trillion yen per year.
- *FOR*. The foreign share of JGBs is projected to increase from 4½ percent at end-2012 to 7 percent by end-2017 under complete policies limiting upward pressure on interest rates, but fall to 2 percent under incomplete policies, as foreign investors become more concerned about fiscal sustainability. These figures represent the highest and lowest foreign share registered in the JGB market since 2000, respectively.

6. Furthermore, domestic bond holdings of major and regional banks are assumed to change in equal proportions to their current holdings. In particular, domestic bond holdings of Japanese banks consist of JGBs, local government bonds, and corporate bonds. JGB holdings are calculated as discussed earlier. A similar approach is used for local government bonds.[4] Corporate bond holdings are assumed to grow in line with nominal GDP. The figure below summarizes the results of these projections for the pre-Abenomics scenario.

Domestic Bond Holdings of Major and Regional Banks
(In trillion yen)



Sources: Bank of Japan and IMF staff projections.

7. The interest rate sensitivity of Japanese banks is calculated as mark-to-market losses to Tier I capital from a 100-basis-point parallel rise in domestic bond yields, in line with the

[4] The BoJ does not hold local government bonds. Foreign purchases of local government bonds are negligible, while social security funds have not been buying local government bonds in recent years. We therefore assume Japanese banks will continue to be the main buyer of local government bonds.

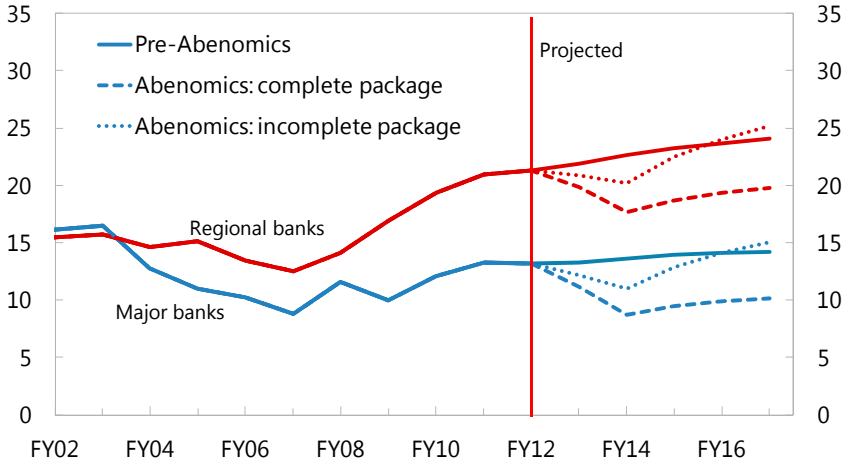
methodology of the BoJ in the Financial System Report.[5] This is reflected in the equation below. For the purposes of this analysis, we assume the duration of domestic bond holdings will remain constant (a reasonable assumption for major banks and a conservative one for regional banks based on past trends). Tier I capital of domestic banks will grow in line with nominal GDP (that is, growing mainly through retained earnings), as higher GDP growth boosts bank profits from more profitable investments and lower credit costs.

$$\text{Interest rate sensitivity} = \frac{\text{Domestic bond holdings} * \text{Duration}}{\text{Tier I capital}}$$

8. All scenarios suggest that interest rate sensitivity of major and regional banks may decline substantially in the near term, mostly on account of BoJ purchases. Under the pre-Abenomics baseline, interest rate risk exposures of major and regional banks were set to rise over the medium term, highlighting growing financial stability risks. Under Abenomics, they are likely to decline substantially over the next two years, as the QQME is projected to reduce JGB holdings of Japanese banks despite government's higher funding needs.

Japanese Banks' Sensitivity to a 100-Basis-Point Interest Rate Shock

(Percent of Tier 1 capital)



Sources: Bank of Japan and IMF staff projections.

9. However, whether financial stability risks remain lower over the medium term depends critically on whether Abenomics succeeds. If structural and fiscal reforms are not sufficiently ambitious to raise growth and alleviate fiscal sustainability concerns, or if inflation expectations do not adjust and further fiscal stimulus is implemented, financial stability risks can start to rise again, eventually surpassing the pre-Abenomics level. This would raise debt over the medium term, increase JGB holdings of Japanese banks, and bring their interest rate risk exposures to levels above the baseline.

[5] Accounting losses may be lower, as mark-to-market losses could be partly offset by existing unrealized gains on domestic bond holdings.

C. Other Considerations

10. Although the scenarios illustrate that Abenomics has the potential to reduce bank-sovereign linkages, if successful, there may be other risks not captured in this framework.

- **Major banks.** The QQME could also lead banks, in particular major banks, to go overseas more aggressively to boost profits. On the one hand, this would provide an opportunity as overseas loans account for only 10-15 percent of total loan portfolios for major banks, particularly in the areas of global and regional syndicated loans and project finance. On the other hand, this could raise foreign exchange (FX) funding risks. In particular, the FSAP Update found Japanese banks to be well positioned to deal with exchange rate volatility as their net FX positions are small, limiting potential valuation losses. At the same time, Japanese financial institutions need to actively manage their FX funding risks by using repos, interbank loans, certificates of deposit, and FX swaps (mostly in U.S. dollar). The cost of some of these funding sources (especially FX swaps) was volatile during the euro area crisis, and in response, banks had to lengthen the maturity of FX swaps and issue more U.S. dollar denominated bonds. Sudden exchange rate movements may also create counterparty risk in FX swap markets, as most of these transactions are settled over the counter.
- **Regional banks.** An important source of income for Japanese banks, in particular regional banks, is interest income generated from long-term domestic bonds. The average remaining maturity of domestic bond holdings has remained at around 2.5 years for major banks, while rising to 4 years for regional banks. In that context, if credit demand in the regional economies is slow to pickup, regional banks may continue to rely on interest income from longer-duration JGBs, making them more susceptible to interest rate risk. This risk could materialize, especially if there is no credible growth plan and the policy package is incomplete. Though regional banks individually are small, as a group (about 40 percent of banking system assets excluding Japan Post Bank and agricultural cooperatives) they are systemically important.
- **Rising risk premium**. These scenarios do not capture the likelihood or severity of a sharp rise in interest rates given fiscal vulnerabilities. Such medium-term tail risks would likely be higher under incomplete policies.

D. Policy Implications

11. Several policy recommendations can be drawn based from this analysis. Under the QQME, the BoJ is set to take up large amounts of interest rate risk from Japanese banks to its own balance sheet, which could help banks provide more risk capital in the near term and support the government's growth objectives. At the same time, in the absence of sufficiently ambitious structural reforms and medium-term fiscal consolidation, Japanese banks' JGB exposure and related interest rate risk could rise again. As recommended by the FSAP Update, initiatives including strengthening capital requirements for domestically active banks and private sector-led consolidation in the regional banking sector could also help mitigate downside risks of incomplete policies on the more vulnerable parts of the banking sector. By strengthening their capital base, such policies would allow banks to take better advantage of the potential reduction in their JGB holdings and increase lending to corporations and households**.**

JAPANESE FINANCIAL INSTITUTIONS EXPANDING ABROAD: OPPORTUNITIES AND RISKS[1]

Overseas activities of Japanese financial institutions have risen, mainly in Asia, since the global financial crisis. Stagnant growth and low interest margins in Japan have added to incentives to seek opportunities abroad. This note explores the determinants of Japanese banks' overseas expansion and assesses whether these cross-border activities will continue under the new macroeconomic policies. The analysis finds that Japanese banks are well positioned to scale up foreign exposures, thanks to their relative resilient balance sheets and the robust growth in the region. Stronger domestic growth in Japan could mitigate the pace, but is unlikely to reverse a long-standing trend because empirical estimates suggest that global and regional factors play a more prominent role in the growth of Japanese cross-border claims. The increasing cross-border activity would pose funding risks and supervisory challenges that require continued close monitoring. In addition, an incomplete set of domestic policies that fails to raise growth could undermine domestic financial stability.

A. Introduction

1. Cross-border activities of Japanese financial institutions have risen over the past few years, particularly to the Asian region. Overseas loans by major banks are growing by over 20 percent year-on-year and major Japanese banks have attained an important global and regional presence, particularly in areas of syndicated lending and project finance. Foreign claims on Asia have recouped the decline at the height of the global financial crisis and are now at levels comparable during 2005–08. Moreover, brokerage firms and life insurers have sought acquisitions or strategic partnership overseas.

2. The overseas expansion has been driven by regional and domestic factors. Stagnant growth and limited domestic credit demand have added incentives for Japanese financial institutions to seek opportunities abroad. The relative resilience of Japanese banks during the financial crisis has provided some capacity to take on further foreign exposures, despite higher global uncertainty. Outside Japan, robust growth in Asia and deleveraging of European banks in the region contributed to a rise of cross-border lending. The exchange rate appreciation in the past years might offer additional incentives for expanding abroad.

3. This note assesses whether this trend will continue under the government's new policy framework often referred to as Abenomics. The Bank of Japan's (BoJ) new quantitative and qualitative monetary easing (QQME) framework—part of the three-pronged strategies to revive growth and exit deflation—intends to encourage financial institutions to shift away from government bonds and take on greater exposures of risky assets (such as loans and investment securities).[2] An improved domestic outlook could increase financial institutions inward focus to satisfy rising credit demand. On the other hand, uncertainty over the Japanese government bond

[1] Prepared by W. Raphael Lam (APD).

[2] The three-pronged strategies Abenomics include flexible fiscal policy, aggressive monetary easing, and structural reforms to exit deflation and raise growth.

(JGB) market and yen movements may stimulate diversifying needs outside Japan. The note seeks to answer the following questions:

- What factors contribute to Japanese financial institutions expanding abroad? Would the cross-border activity of these financial institutions continue or reduce under the Abenomics?
- What are the risks in light of increasing cross-border activity and the implications for financial institutions and supervisors?

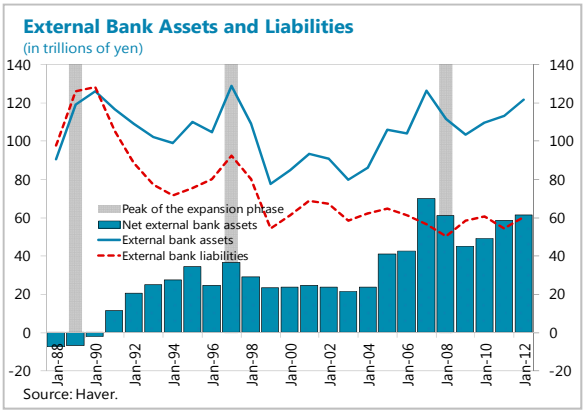
4. The trend of expanding overseas is likely to continue, but will depend on a supportive domestic economy under successful Abenomics and careful risk management and supervision. Empirical analysis indicates that modest global uncertainty, large growth differentials, and the resilience of domestic banking systems are key drivers for cross-border claims. In addition, robust growth in Asia and sufficient liquidity at home would imply the trend of expanding abroad is likely to continue. Although stronger domestic growth might slow the expansion pace, it is not expected to reverse the trend unless an incomplete Abenomics poses risks to domestic financial stability. Increasing cross-border activity also adds to funding risks and supervisory challenges that require continued close monitoring.

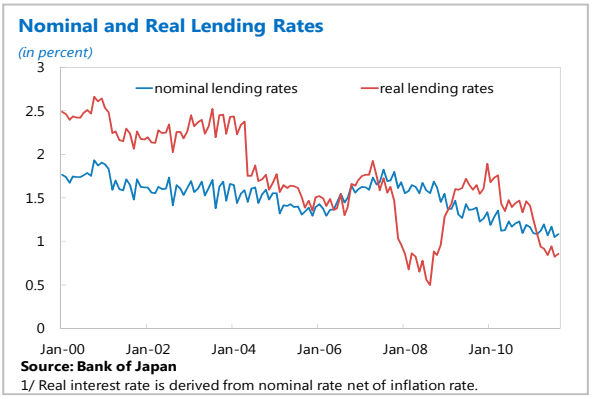
5. The note is organized as follows: Section B analyzes the determinants for banks' expanding abroad based on an empirical analysis and Japan's experience. Section C discusses the outlook and risks of Japanese financial institutions expanding overseas after the global financial crisis, followed by policy implications and conclusions in Section D.

B. Determinants of Banks' Cross-Border Expansion and Japan's Experience

6. The expansion of Japanese financial institutions abroad over the last two decades was only partly successful (text charts). During the mid to late 1980s, financial institutions rapidly raised overseas exposures in tandem with outward FDIs of real estate and construction companies, but that ended abruptly with losses incurred after the domestic asset bubble burst. Subsequently, in the years leading up to the Asian financial crisis, banks financed overseas loans to developing Asia mostly through foreign exchange financing. Banks incurred sizeable valuation losses and higher nonperforming loans (NPLs) after the Asian financial crisis, forcing them to recede on overseas lending. Losses abroad added to financial vulnerabilities at home (for example, credit risks in SMEs and declining interest rates) and contributed to the subsequent banking crises in Japan in the early 2000s.[3]

[3] Since then, consolidations in the financial sector gave rise to a concentrated market with a few megabanks in the form of financial groups, securities firms, and life insurers.





7. Japanese banks have increased their cross-border activity, mostly to the Asian region. Cross-border consolidated claims of Japanese banks abroad have increased since 2005 and reached near US$3 trillion (about 15 percent of total banking and trust assets) according to the Bank of International Settlement (BIS). Claims on Asia have more than doubled since the global financial crisis (now accounting for about 16 percent of total foreign consolidated claims), and is now at a level comparable during 2005–08. The exposures to Europe, however, have significantly slowed after the global financial crisis (Text table and Figure 1). A large share of the rising foreign claims is attributed to growing overseas loans by major banks. Overseas loans account for about 15–20 percent of the total outstanding loan balance as of September 2012, with the lending activity to Asia the strongest.

Foreign Consolidated Claims of Japanese Banks

(in percent)	Year-on-year growth	Cumulative growth from 2005-2008	Cumulative growth since end-2008	Share of total consolidated claims
All countries	0.1	72.6	37.0	100.0
Europe, of which:	10.8	83.3	2.5	25.4
Pheripheral European countries	-1.2	73.8	-22.5	2.8
Core European countries	15.1	88.6	7.0	17.0
United States	8.1	67.0	42.1	43.6
Asia Pacific, of which:	13.4	124.1	102.9	15.9
Advanced	14.1	131.1	107.8	8.6
Emerging	12.6	115.9	97.4	7.2
Offshore centers	4.4	19.2	62.4	12.4

Source: BIS.
1/ As of September 2012.
2/ Pheripheral European countries include Italy, Ireland, Greece, Portugal, and Spain.
3/ Core European countries include France, Germany, Switzerland, and United Kingdom.

8. The trend on overseas expansion by Japanese financial institutions has recently picked up again, driven by several regional and domestic factors:

a. Domestic factors:

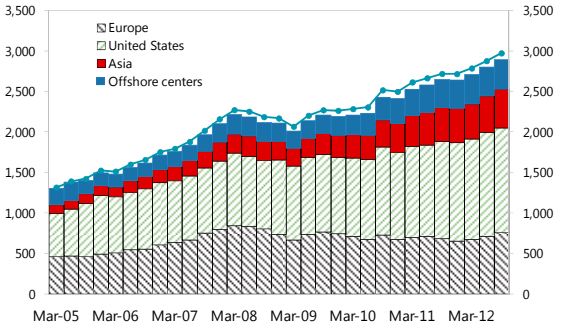
- **Limited domestic opportunities have pushed a need for major Japanese banks to expand abroad.** Credit demand was sluggish in the past few years due to stagnant growth, though it has picked up recently. Large corporations have limited funding need as they accumulated sizeable surpluses (rising to about 6 percent of GDP).[4]

[4] Estimates suggest that business capital expenditures for fixed investment only account for less than 30 percent of total credit demand. External financing through capital increases has been negative (on average about ¥5 trillion per year) for the past decade due to weak equity markets. Bank lending has somewhat picked up recently, reflecting reconstruction and housing loans demand.

Figure 1. Cross-border Activity of Japanese Banks

Consolidated Foreign Claims for Japanese Banks

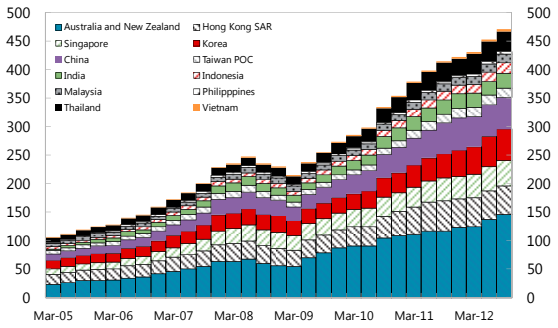
(In billions of USD)



Source: BIS.

Japanese Banks: Consolidated Foreign Claims on Asia

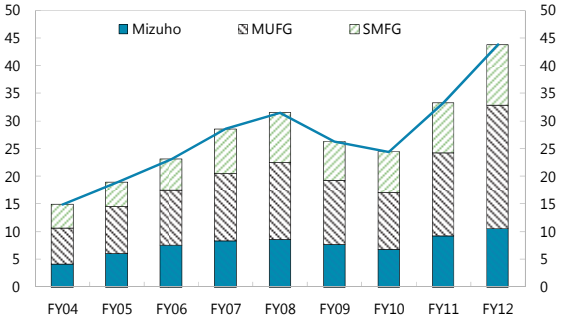
(In USD bn)



Source: BIS.

Overseas Lending of Megabanks

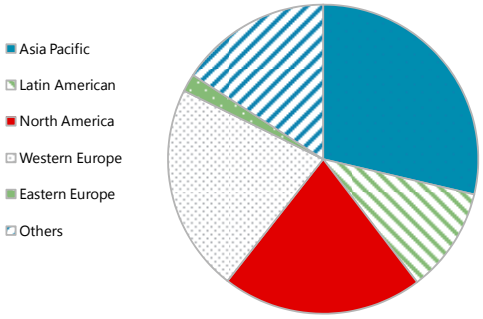
(In trillions of yen)



Sources: Disclosures of individual banks.

Overseas Loans by Geographic Regions

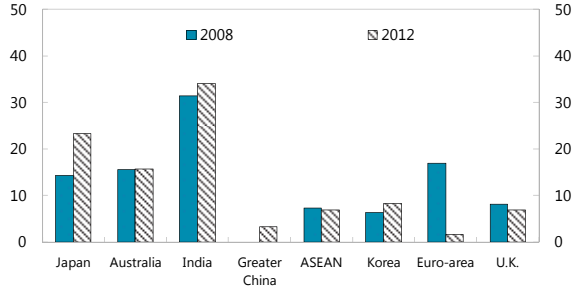
(In percent)



Sources: Individual banks' disclosures

Project Finance in Asia Pacific (ex Japan) by the Nationality of Parent Banks

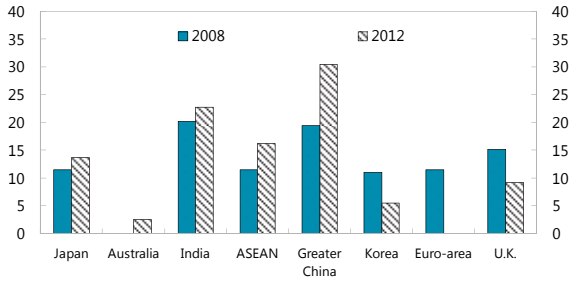
(In percent of the proceeds of top 25 mandated arrangers)



Sources: Dealogic and IMF staff estimates.
1/ Based on the nationality of parent mandated arrangers in percent of the proceeds for top 25 mandated arrangers.

Syndicated Loans in Asia Pacific (ex Japan) by the Nationality of Parent Banks

(In percent of proceeds of top 25 mandated arrangers)



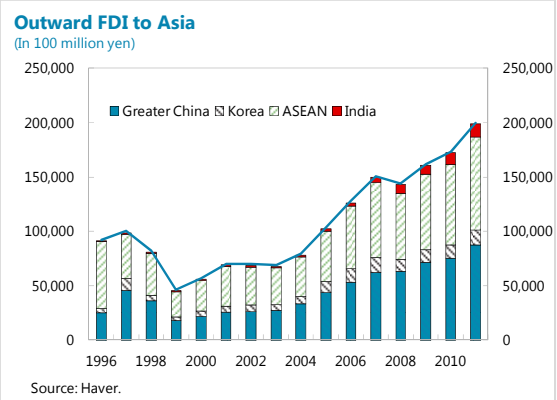
Sources: Dealogic and IMF staff estimates.
1/ Based on the nationality of parent mandated arrangers in percent of the proceeds for top 25 mandated arrangers.

Structural factors—such as high leverage among SMEs, population aging, and sluggish growth in Japan's regions—have limited domestic opportunities. At the same time, low interest rates have persisted for a decade but lingering deflation has limited the decline of real interest rate to sufficiently stimulate credit demand. Shrinking net interest margin on loans (about 0.6-1.2 percent now relative to about 1.2–2.1 percent in early 2000s) tends to limit banks' core profitability as interest income accounts for more than two-thirds of banks' total income.

- **Major banks have remained resilient during the global financial crisis and have some capacity to take on foreign exposures.** They have abundant yen liquidity supported by a stable deposit base, and have further strengthened their capital adequacy (Tier 1 ratio at 12 percent) after the global financial crisis, in part to meet the Basel III requirements. The resilience of balance sheets in the Japanese banks has placed them in a better position to further expand overseas, despite lingering global uncertainty. The exchange rate has appreciated until recently, which may offer an additional incentive for expanding abroad.

b. Regional and global factors:

- **Robust growth and large financing needs in Emerging Asia offer new business opportunities for Japanese banks**. Japan's proximity to the rest of Asia is an advantage. Major banks have also benefited from the increasing outward FDI and trade links of Japanese firms. Financing needs for infrastructure in Emerging Asia are large (about US$8 trillion), according to the Asian Development Bank. These generate demand for cross-border financial activity between Japan and various FDI destinations (text chart).



- **The deleveraging of European banks since 2010 has accelerated the pace of overseas expansion.** Japanese banks, among other local Asian banks, have stepped up financing to gain market share against the scale-back of European banks in the region.

9. An empirical analysis is used to assess determinants of banks' overseas expansion and provide insights to whether the current trend is different from previous episodes. The analysis uses the quarterly consolidated year-on-year growth of foreign claims on an immediate borrowers basis published by the BIS. The sample is from 1984–2012, spanning across a panel of banking systems consisting of both origination and destination of cross-border claims: the origination countries/regions are mostly advanced countries, including Australia, Japan, France, Germany, Italy, Switzerland, Sweden, the United Kingdom, the United States, and Developed Europe; the destination countries or regions include Emerging Asia (China, India, ASEAN5), Developing Europe, and Latin America. The foreign claims are in U.S. dollar terms and are subject to valuation changes driven by exchange rate movements, which could be partly controlled by including the weighted exchange

rates as an explanatory variable.[5] The explanatory variables are broadly classified into three categories with the specification as follows:

$$FC_{i,t}^{j} = \beta_0 + \gamma_{i,j} + \beta_1 \, FC_{i,t-1}^{j} + \boldsymbol{\beta_2} \, \boldsymbol{GF_t} + \boldsymbol{\beta_3} \, \boldsymbol{RF_t^j} + \boldsymbol{\beta_4} \, \boldsymbol{HF_t^i} \quad + \boldsymbol{\varepsilon_{i,t}}$$

where *i* and *j* stand for origination and destination countries/regions of foreign claims, respectively. A fixed effect coefficient γ_{ij} is included for each group. The explanatory variables include:

- *Global factors (GF)* consisting of the VIX index, and the Fed Fund rate;
- *Regional factors (RF)* consisting of growth differentials and real effective exchange rate movements between destination and origination countries/regions. The regression also considers alternative indicators of growth differentials using the change of fixed investments.
- *Home factors (HF)* consisting of domestic interest rates, real effective exchange rates, growth of domestic credit to GDP ratio, several indicators for the soundness of the banking systems in origination countries/regions that include Tier 1 capital ratios, nonperforming loan ratios, and the return on assets.

10. The empirical results provide an intuitive explanation of the growth of banks' foreign claims in Japan and other advanced countries (Table 1). Empirical results show that higher global uncertainty (measured by the VIX index) tends to reduce banks' activities abroad, though the magnitude is not statistically significant for Japanese banks. In terms of regional factors, interest rates at the destination, as a proxy for the tightness of financing conditions, also play some role. The growth differential is also an important driver for banks' foreign claims. For instance, a 1-percentage-point increase of the real growth differential could increase the foreign claims by about 0.3–1.6 percentage points. While a currency appreciation in the origination countries tends to increase banks' activity overseas, the coefficients are not statistically significant across all specifications. Regarding home factors, higher domestic credit growth is generally associated with slower growth overseas, possibly suggesting some substitution in banks when extending credit between home and abroad. In addition, the soundness of banking systems at home is important in banks' overseas activity. Higher capital adequacy and lower NPLs are usually associated with higher cross-border activity with strong statistical significance.

[5] Including the exchange rate as an explanatory variable controls only partly for valuation changes in the BIS data. Strictly speaking, the exchange rate to be included should reflect the composition of foreign claims of origination countries/regions. By using the real effective exchange rate based on external trade weights as a proxy would imply an assumption that those weights are identical to those of foreign claims composition.

Table 1. Empirical Analysis on Bank's Foreign Claims 1/ 2/

Dependent variable: Foreign claims (year-on-year percentage change *(i,j)*)

	Specification			
Origination	European banks only	All	All	All
Destination countries / regions	All	All	Grouped by regions ex. China	Grouped by regions
	(1)	(2)	(3)	(4)
Fixed effects *(i,j)*	Y	Y	Y	Y
Constant	**171.1*** **	**127.6*** **	49.7	**65.60***
	(54.8)	(40.9)	35.2	(38.1)
Lagged foreign claims	**0.45*** **	**0.48*** **	**0.58*** **	**0.58*** **
(yoy pct. change)	(0.05)	(0.04)	(0.61)	(0.05)
Global factors				
Lagged VIX index	**-1.01*** **	**-0.70*** **	**-0.44*** **	**-0.63*** **
	(0.21)	(0.21)	(0.15)	(0.18)
Lagged U.S. Fed-fund rates	**0.27** **	**0.17** **	**0.15** **	**0.17** **
	(0.09)	(0.08)	(0.09)	(0.06)
Regional factors				
Real growth differential *(i,j)*	0.78	**1.66** **	0.59	**1.02** **
	0.69	(0.73)	0.48	(0.56)
dln (REER differential *(i,j)*)	-4.62	-7.32	-7.27	-5.27
	3.80	8.00	5.32	4.95
Interest rates (j)	-	**1.19***	-1.16	-1.06
		(0.64)	1.86	1.54
Home factors				
Interest rates (i)	-1.08	-	-	-
	1.09			
Lagged domestic credit/GDP (i)	**-24.2** **	**-18.6** **	-2.32	-6.63
	(11.0)	(8.8)	8.15	8.26
Soundness of banking system (i)				
Capital adequacy (Tier 1 ratio)	**17.45*** **	**13.05** **	**8.8***	**10.02***
	(4.51)	(5.04)	(4.9)	(5.09)
Nonperforming loans ratios	**-7.57*** **	**-5.5** **	**-5.77*** **	**-4.3** **
	(2.05)	(2.6)	(1.3)	(1.9)
Returns on assets	-15.6	20.8	**17.5***	**22.4***
	(18.6)	(17.4)	(10.3)	(13.3)
R-squared	*0.40*	*0.36*	*0.49*	*0.49*
No. of observations	*535*	*863*	*389*	*496*
No. of origination countries or regions	*5*	*9*	*9*	*9*
No. of destination countries or regions	*7*	*7*	*3*	*4*

Source: author's estimates.
1/ Notation *i* and *j* refer to origination and destination countries or regions of the foreign claims, respectively.
2/ '*'. '**', and '***' denote the statistical significance at 10 percent, 5 percent, and 1 perecnt, respectively.

11. Applying the results to Japanese banks would imply that global and regional factors play a key role in explaining the rise of foreign claims. As an illustration, Japanese banks' foreign claims on Asia have grown by 103 percent since end-2008, of which about 40 percentage points are attributed by a decline of global uncertainty proxied by the VIX index, while regional factors contributed another 20–25 percentage points. Regarding home factors, the soundness of the

banking system, particularly the strengthening of capital adequacy, contributed to around one-third of foreign claims growth. The substitution between domestic and foreign credit contributed modestly by about 5 percentage points.

C. Outlook and Risks for Major Banks Expanding Overseas

12. The expansion abroad has made Japanese banks key players in regional and global syndicated loans and project finance (Figure 1). Megabanks have stepped up project finance and syndicated loans business, particularly in Asia, because of their strong balance sheets and long-term approach in lending. Besides interest income on lending, banks also earn fees from arranging and underwriting deals. The three megabanks in Japan have played an increasing role in these areas, with the average ranking and market share rising, particularly following the recede of European banks. [6] In addition, Japanese banks are often the only Asian banks that were ranked among the top global banks in these types of finances outside Asia.

13. Overseas lending performance among Japanese banks has been stronger in several ways compared to domestic lending (Figure 2). Overseas gross profits now account for about 30 percent of total gross profits (about half of which arise from net interest income).[7] Net interest margins for overseas loans have improved after the global financial crisis and exceeded those for domestic loans. As megabanks have been cautious in lending abroad to firms with established credit history, credit risks on overseas loans are moderate. The average risk-monitored loans ratio for overseas lending was about 0.7 percent as of September 2012, much lower than that on domestic lending (about 2 percent). Syndicated loans to foreign firms usually carry high investment ratings, while those to firms in emerging markets are relatively small (less than the global average in proportion) and about one-fifth of the syndicated loans have covenants that limit credit risks. Though project finance could be more risky because of the longer duration, it is usually backed by underlying infrastructure assets.[8] At the margin, overseas loans therefore appear more profitable in general but are associated with less risk.

[6] They have been among the top 25 mandated arrangers and bookrunners over the past few years. Mitsubishi UFJ Financial Group, which includes Bank of Tokyo-Mitsubishi UFJ (BTMU), was the top-ranked global mandated arranger of project finance deals in the first nine months of 2012, with Sumitomo Mitsui Financial Group and Mizuho Financial Group in the third and fourth places, respectively.

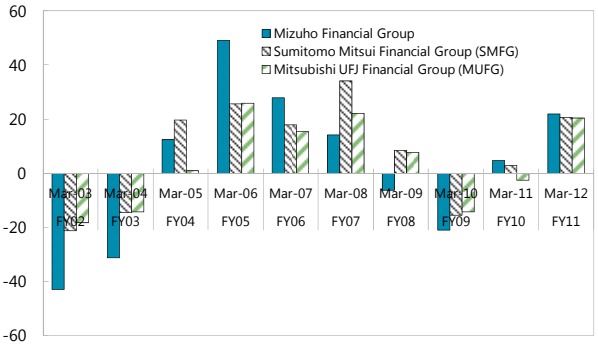
[7] For instance, Mizuho Financial Group has about 25 percent of net business income are derived from overseas customers, with return on assets for overseas loans at about 3.3 percent in FY2012.

[8] According to the BoJ, default rates on selected overseas loans ranged from 0.4–1.3 percent, much lower than the respective loan margins (FSR Chart III 3-11). Banks are relatively cautious in choosing overseas loan extension and setting loan conditions.

Figure 2. Comparison of Overseas Lending Activity by Three Megabanks

Japan: Megabanks Overseas Lending Growth 1/

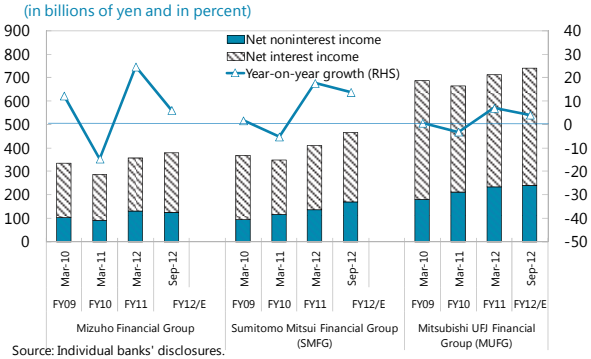
(in percent)



Source: Individual banks' disclosures.
1/ Based on three financial groups on a consolidated basis.

Japan: Net Overseas Income for Megabanks 1/

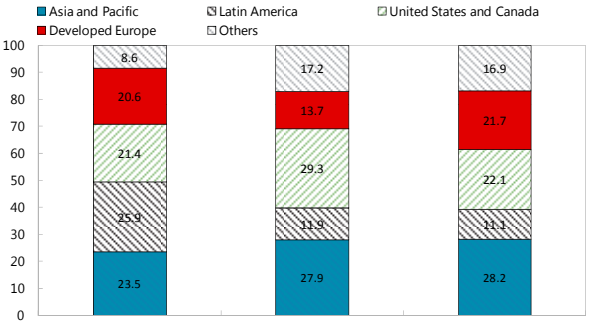
(in billions of yen and in percent)



Source: Individual banks' disclosures.
1/ Based on individual banks for each financial group on a consolidated basis. FY12 data are based on annualized figures as of September 2012.

Japan: Geographical Distribution of Overseas Loans 1/

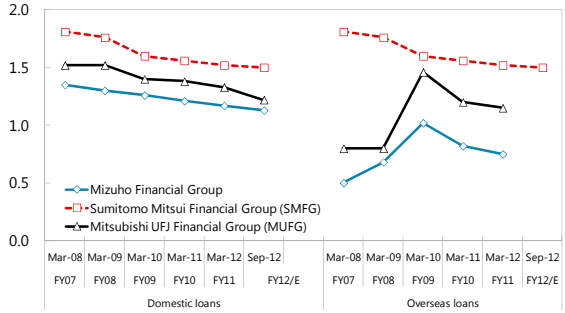
(in percent of total overesas loans; average across FY2009-11)



Source: Individual banks' disclosures.
1/ Based on individual banks in each financial group on an unconsolidatead basis.

Japan: Net Interest Margins 1/

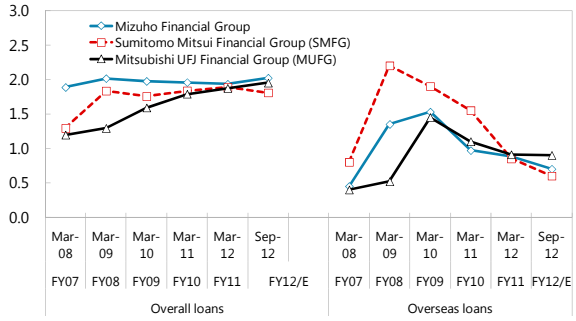
(in percent)



Sources: Individual banks' disclosures, Fitch ratings, and staff estimates.
1/ Data on domestic loans are based on individual banks in each financial group on an unconsolidated basis. Data for overseas loans are based on each financial group on a consolidated basis. .

Japan: Risk-monitored Loans Ratio 1/

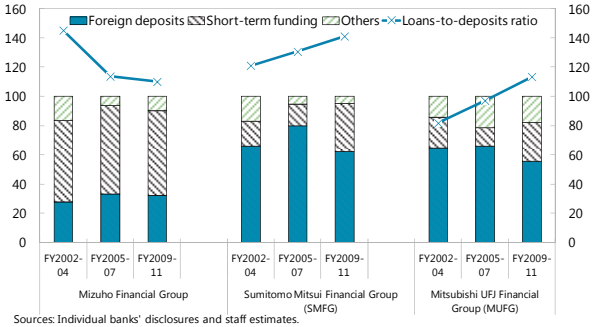
(in percent)



Sources: Individual banks' disclosures, Fitch ratings and staff estimates.
1/ Data on overall loans are based on each financial group on a consolidated basis. Data for overseas loans are based on individual banks in each financial group on an unconsolidated basis.

Japan: Funding of Overseas Operations 1/

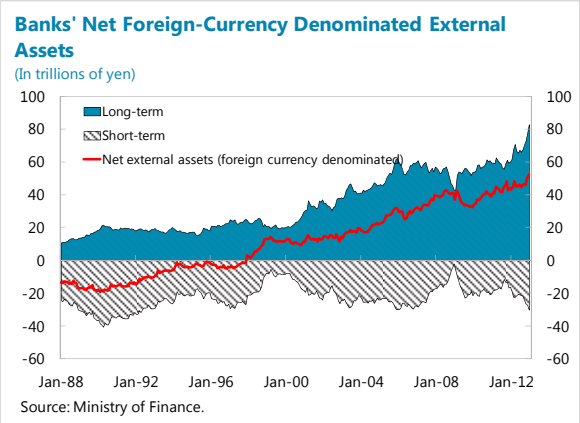
(in percent of total overseas funding and in percent for loans-to-deposits ratio)

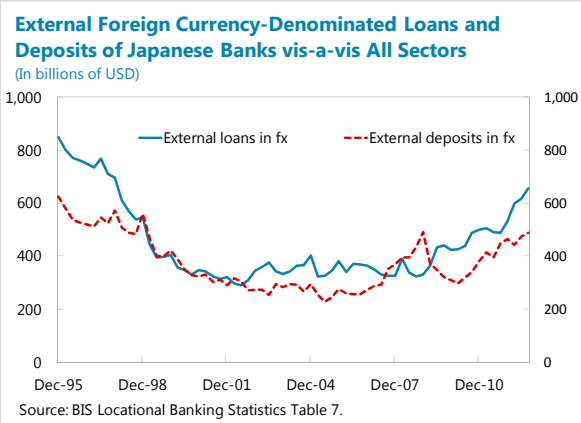


Sources: Individual banks' disclosures and staff estimates.
1/ Figures indicate an average across stated periods on a yearly basis. Short-term funding refers to negotiable certificates of deposits, calls money, repos, and borrowed money. Data on loans-to-deposits ratio are based on each financial group in a consolidated basis, while overseas funding is based on individual banks in each financial group on a consolidated basis.

14. Japanese banks are likely to continue expanding overseas under successful Abenomics. Policies under Abenomics would mostly affect home factors and exchange rates based on the IMF 2013 Spillover Report. Successful policies may also reinforce the trend if there are positive spillovers globally and to the region. In Asia, growth is expected to remain robust over the medium term and the global recovery takes hold, Japanese banks will likely continue expanding abroad. Recovering domestic opportunities under Abenomics may slow the expansion pace but empirical estimates suggest that the substitution effect between domestic and overseas lending contributed modestly to the trend (about 5 percent in the growth of foreign claims).

15. The current trend of overseas expansion has some differences from previous episodes but may pose additional challenges (text charts). In the past, Japanese banks have traditionally expanded abroad to support the expansion of Japanese corporations (e.g., real-estate companies in 1980s). But over the past few years, banks have also moved toward extending loans to non-Japanese entities, now reaching about 70 percent of overseas loans. Second, over time Japanese banks have accumulated net external foreign assets while the short-term liabilities have remained stable. While part of the increase is attributed to higher foreign assets held by trust banks, the increase may suggest banks have relied on domestic yen-denominated funds to finance long-term overseas loans.





16. Foreign currency and maturity mismatches are likely to rise going forward as the long-term funding base in Japanese banks has fallen short of total external loans. Japanese banks extend most overseas lending in U.S. dollar and in long maturity for which they do not have a natural funding base. These create dollar funding risks and add to the maturity mismatch in foreign lending. Major banks have increased their local deposit base (e.g., corporate deposits)—accounting for about half of the funding base—but it still falls short of the total external loans. Banks therefore have to rely on short-term instruments such as yen-dollar basis and currency swaps that are subject to volatility, and by issuing foreign exchange-denominated bonds. The loan-to-deposit ratio for overseas loans continues to exceed 100 percent (compared to the loan-to-deposit ratio for domestic loans at about 70 percent), potentially contributing to funding risks. Funding cost and availability depend on credit ratings, which also affect prospects of securing certain lines of business. In an event of credit downgrades, funding cost could rise substantially and the loss of certain lines of business precipitate initial difficulties. In addition, an incomplete set of domestic policies that fails to raise growth could undermine domestic financial stability and affect the prospects of overseas lending.

D. Policy Implications and Conclusions

17. The trend of expansion abroad by Japanese financial institutions is likely to continue, though the pace may slow as domestic opportunities recover under successful Abenomics. Limited domestic credit demand and the relative resilience of balance sheets have added incentives for Japanese financial institutions to take on further foreign exposures. Robust growth in Asia and deleveraging of European banks in the region also contributed to the rise of cross-border lending. Japanese banks have also broadened their financing to non-Japanese entities and local demand, in contrast to previous episodes of overseas expansion in the late 1980s and 1990s. An incomplete set of policies under Abenomics, however, could pose risks for financial stability that could halt the overseas expansion.

18. Japanese financial institutions should rely on a gradual and cautious approach in their overseas strategies. Banks' expansion overseas is positive but a rapid expansion could lead to buying foreign assets at high prices or entering unfamiliar local markets that could eventually result to heavy losses as in the earlier episodes of expansion in late 1980s and 1990s. Banks may favor a gradual expansion to maintain their balance sheets given the new global regulations (e.g., Basel III requirements).

19. Supervisors would need to closely monitor the funding risks on cross-border activities and continue to enhance the cooperation with foreign supervisory authorities. Securing stable and long-term dollar funding has remained a risk for Japanese financial institutions. Supervisors should encourage banks to further improve their resilience against shocks by strengthening their funding sources and risk management, such as by closely monitoring the overseas maturity mismatch and FX-denominated loans-to-deposits ratios. At the same time, overseas activities add to challenges on cross-border supervision for financial institutions. Cross-border risk monitoring arrangements with foreign supervisory authorities can help monitor risks from cross-border activities, including foreign exchange funding risks. In that regard, following discussions at the Financial Stability Board (FSB), the Japan Financial Services Agency and the Bank of Japan have signed the Multilateral Framework for sharing the information of globally systemically important banks (G-SIBs) collected through the FSB Data Gap Initiatives in early 2013.

20. Ensuring a complete package of Abenomics would be important for financial stability. An incomplete set of policies that fails to raise growth and reverse the rising public debt-to-GDP ratios, however, could pose risks for financial stability, thereby could reduce foreign exposures as occurred in the previous overseas expansion episodes in the late 1980s and in the early 2000s.