AMRO Country Report
ACR/20-06

AMRO Annual Consultation Report

Japan - 2019

The ASEAN+3 Macroeconomic Research Office (AMRO)

March 2020

Acknowledgments

1. This Annual Consultation Report on Japan has been prepared in accordance with the functions of AMRO to monitor and assess the macroeconomic status and financial soundness of its members; identify relevant risks and vulnerabilities; report these to member authorities; and if requested, assist them in mitigating these risks through the timely formulation of policy recommendations. This is being done in accordance with Article 3(a) and (b) of the AMRO Agreement.

2. This Report is drafted on the basis of the Annual Consultation Visit of AMRO to Japan from 5 November to 15 November 2019 (Article 5 (b) of AMRO Agreement). The AMRO Mission team was headed by Dr. Jae Young Lee, Group Head and Lead Economist. Members include Dr. Jinho Choi (Senior Specialist and Country Economist for Japan), Dr. Xianguo Huang (Back-up Economist), Ms. Wanwisa May Vorranikulkij (Back-up Economist), Dr. Wei Sun (Financial Specialist), Mr. Takashi Yonemura (Associate Researcher) and Ms. Chanvanny Dy (Associate). AMRO Director Mr. Toshinori Doi and Chief Economist Dr. Hoe Ee Khor also participated in key policy meetings with the authorities. This AMRO Annual Consultation Report on Japan for 2019 was peer-reviewed by Dr. Siu Fung (Matthew) Yiu (Group Head and Lead Economist) and Mr. Suan Yong Foo (Senior Economist); and was approved by Dr. Hoe Ee Khor.

3. The analysis in this Report is based on information available up to 27 December 2019.

4. By making any designation of or reference to a particular territory or geographical area, or by using the term “member” or “country” in this Report, AMRO does not intend to make any judgments as to the legal or other status of any territory or area.

5. On behalf of AMRO, the Mission team wishes to thank the Japanese authorities for their comments on this Report, as well as their excellent meeting arrangements and hospitality during our visit.

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Executive Summary

1. **Despite continued weakness in exports amid a global slowdown, the Japanese economy has remained resilient, underpinned by sustained domestic demand.** Real GDP maintained strong growth in the first three quarters of 2019. Private consumption continued to show steady growth. Meanwhile, business investment stayed strong, led mainly by solid investment in the non-manufacturing sector, notwithstanding the modest capex investment by manufacturing companies. Government consumption and public investment also provided strong support. In contrast, exports continued to weigh on growth amid weak external demand. Looking ahead, real GDP is expected to expand by 1.0 percent in FY2019, before slowing to 0.6 percent in FY2020.

2. **Consumer price inflation has remained positive but at a relatively low level, far below the Bank of Japan's (BOJ's) 2 percent price stability target.** CPI (less fresh food) inflation has dropped since Q2 2019, reflecting a decline in oil prices. The BOJ's preferred measure of core inflation—excluding fresh food and energy—exhibited a modest upward trend amid tight labor market conditions and a positive output gap, but stayed at around 0.5 percent. Medium-term inflation expectations have been stable at around 1 percent. Going forward, consumer price inflation is expected at around 0.6 percent in FY2019 and 0.5 percent in FY2020 (excluding the effects of the consumption tax hike and policies concerning the provision of free education), well below the BOJ's 2 percent target.

3. **Japan's external position remains strong with its sizable current account surplus, which is, in turn, supported by a large primary income surplus.** The source of Japan's current account surplus has shifted from goods trade surplus to interest and dividend incomes earned from its large overseas investments. The goods trade balance has weakened, adversely affected by U.S.-China trade tensions and a slowdown in China. The service account deficit has gradually improved in recent years, largely due to increasing receipts from intellectual property rights, tourism and other business services. The financial account has been driven by residents' outward investments in search of higher returns.

4. **The financial system remains sound although financial institutions are struggling with low profitability.** Credit growth continues to be relatively robust, reflecting easy monetary conditions. The banking sector has sufficient capital buffers, while non-performing loan ratios have stayed low. However, the ultra-low interest rate environment has squeezed banks' net interest margins, exerting downward pressure on profitability, especially that of regional banks which depend mostly on domestic lending. To offset declining net interest margins, major banks have been expanding their overseas lending, and investing in foreign securities including structured credit products. Meanwhile, regional banks are continuing to extend loans to small firms, albeit at a slower pace.

5. **Although the fiscal balance has been on a gradual consolidation trend, the deficit is expected to widen in FY2019 and FY2020, due mainly to the new fiscal stimulus package.** Owing to higher growth in tax revenues and sustained expenditure discipline, the fiscal deficit narrowed from 3.3 percent in FY2015 to 2.7 percent in FY2017, and further to 2.2 percent in FY2018. Going forward, driven by the new fiscal stimulus package, the overall fiscal deficit is projected to widen significantly to 3.2 percent in FY2019 before narrowing slightly to 3.0 percent in FY2020.

6. **The Japanese economy is confronted with downside risks in the near term, mainly from external factors.** These include a sharper-than-expected slowdown in China, re-escalation of trade protectionism including from the U.S.-China trade tensions, and a sharper-than-expected slowdown in global growth. Domestically, the effects of the consumption tax hike implemented in October 2019 on private consumption are expected to be less severe than those of the 2014 tax hike, mainly as a result of the government's countermeasures. However, there is a risk of a prolonged weakness in private consumption amid weak consumer sentiment. Structural challenges include demographic drag from population aging and low fertility rates, prolonged easing of monetary policy, and a weakening in fiscal discipline.

7. **Building on the achievements made so far, the authorities should strengthen structural reform efforts, the so-called "third arrow" of Abenomics.** The first "two arrows" of Abenomics—easy monetary policy and flexible fiscal policy—have contributed to raising the economy's growth momentum, sustaining stable and positive inflation, while curbing the further build-up of public debt relative to GDP. However, the policy framework should focus on boosting the economy's longer-term growth by enhancing labor productivity and fostering the services sector and "new economy" activities through the application of advanced digital technologies. Fiscal sustainability should be prioritized through continued revenue mobilization efforts and expenditure prioritization to support structural reforms.

8. **Fiscal authorities should step up efforts toward improving fiscal sustainability.** The implementation of the consumption tax hike is expected to contribute to not only securing more revenues but also maintaining the government's credibility in ensuring fiscal discipline. The offsetting measures against the tax hike should be tapered as planned, so that the additional tax revenue can be used to improve the fiscal balance. Besides the tax hike, ongoing efforts on expenditure reforms should be strengthened by curbing public spending on non-essential projects, while improving the efficiency of the public sector through enhanced digitalization. Extensive healthcare benefits should be carefully reviewed and controlled to maintain modest growth in social security-related expenditure.

9. **The current easy monetary policy stance should be maintained to support growth and counter disinflationary pressures, and the BOJ should be ready to ease further in the event of a sharp economic downturn amid external headwinds.** To manage the private sector's inflation expectations so that they remain significantly positive, the current accommodative monetary policy stance should be continued, or even eased further if the economy were to weaken significantly. However, the authorities should be mindful that the policy space under the quantitative and qualitative monetary easing (QQE) policy has become increasingly limited over time as the BOJ's asset holding has reached an unprecedentedly high level – above 100 percent of Japan's nominal GDP.

10. **Structural reforms should be pursued in a comprehensive manner to enhance the growth potential of the economy amid an aging population.** The authorities' proactive approach toward "Society 5.0" with a focus on advanced technologies is commendable. Further corporate governance reforms are necessary to improve efficiency and transparency in management to enhance their attractiveness to investors. The revitalization of regional economies should be stepped up to correct the high concentration of economic activities in major cities and their neighboring prefectures. To cope with labor shortages owing to an aging population, the effective utilization and development of human resources needs to be strengthened by implementing work style reforms, employing robotics and automation, and embracing more foreign workers.

A. Recent Developments and Outlook

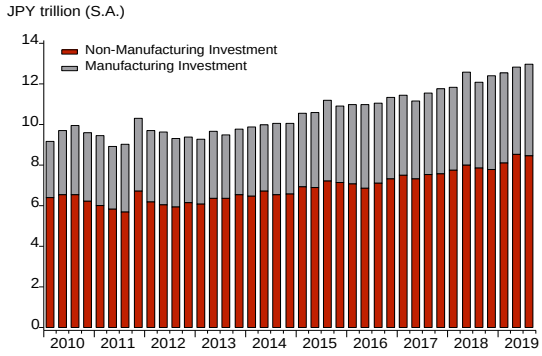
A.1 Real Sector Developments and Outlook

1. **Despite continued weakness in exports amid a global slowdown, the Japanese economy has remained resilient, underpinned by sustained domestic demand.** Real GDP expanded by 1.8 percent (annual rate) in Q3 2019, slowing from 2.0 percent in Q2. Private consumption continued to show steady growth in Q3, supported by front-loaded spending ahead of the consumption tax hike. Business investment, meanwhile, stayed strong, led mainly by solid investment in the non-manufacturing sector, notwithstanding the modest capex investment by manufacturing companies. Government consumption and public investment also provided strong support. In contrast, exports continued to weigh on growth amid weak external demand.

2. **Japan's services sector—with solid capex investment and strong inbound tourism—provides some support to the economy against weaker external demand.** Non-manufacturers have steadily expanded capital expenditure to cope with severe labor shortages and consumers' growing preference for online shopping and the sharing economy (Figure 1). Investments in the services sector have increased significantly to address labor shortages, in particular in leasing, delivery and postal services. Meanwhile, the upward trend in foreign visitors, reaching 31 million persons in 2018[1], significantly contributed to narrowing of the service exports deficit. Given its large share in the economy and its lower sensitivity to external demand fluctuations, the service sector is expected to play a more pivotal role as a growth engine going forward.

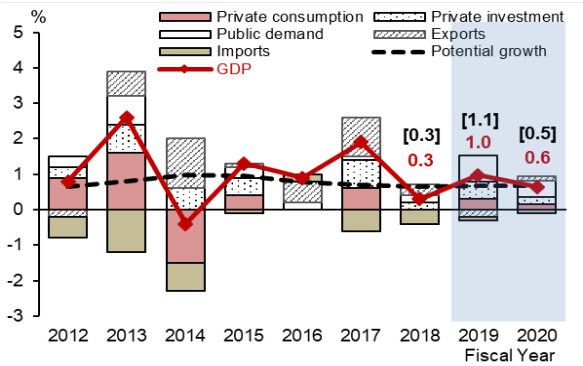
3. **Looking ahead, growth is expected to be 1.0 percent in FY2019, before slowing to 0.6 percent in FY2020.** In FY2019, the economy is expected to expand at a faster pace than its potential growth, mainly driven by buoyant domestic demand despite the consumption tax hike. In FY2020, private consumption is projected to soften somewhat as some of the government's temporary offsetting measures expire. Business investment is expected to decelerate amid weaker corporate profits. However, public spending should provide a boost to growth, driven by the new fiscal stimulus package (See Box A. *Initial Assessment of the New Fiscal Stimulus Package*). Net exports are likely to remain weak in view of the expected slowdown in the major advanced economies. On balance, growth is expected to slow in FY2020 (Figure 2).

Figure 1. Capex Investment by Industry



Source: Ministry of Finance, Japan (JMOF)

Figure 2. Real GDP Growth



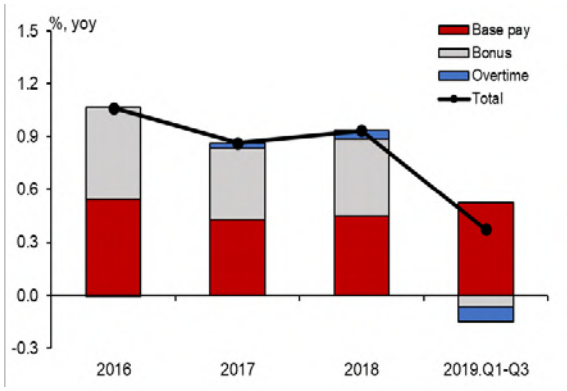
Note: The projection figures in brackets are based on calendar year.
Source: Cabinet Office; AMRO staff estimates

[1] In 2019, the number of foreign visitors posted at 29.4 million persons during the period January to November, modestly increasing from 28.6 million persons in the same period of 2018, despite a significant decline in Korean tourists.

4. **The labor market remains tight, while employment and wage growth has slowed.** Several indicators point to a moderation in the tight labor market conditions. The job offer-to-applicant ratio has stayed at a high of 1.57 in December 2019, albeit down from a recent peak of 1.63 in April 2019. The unemployment rate inched up to 2.4 percent in September and October 2019, followed by falling to 2.2 percent in December 2019.[2] Employment growth[3] slowed to 1.05 percent (yoy) in November 2019 from 2.76 percent in April 2018. Meanwhile, nominal wage growth slowed to 0.4 percent[4] (yoy) in the first 11 months of 2019 from 0.7 percent in the same period of 2018, mainly driven by shrinking overtime and bonus payments while base pay has continued to grow modestly (Figure 3). Growth in real wage income of employees decelerated to 1.1 percent in the first 11 months from 2.2 percent in the same period in 2018, reflecting slower growth in employment and nominal wages.

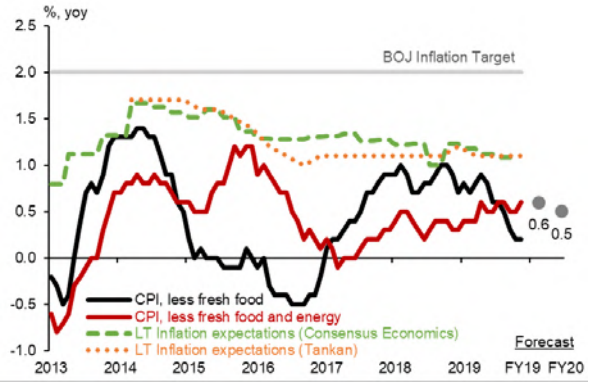
5. **Consumer price inflation has remained positive but at a relatively low level, far below the BOJ's 2 percent price stability target.** CPI (less fresh food) increased to 0.7 percent in December 2019 after the consumption tax was hiked. Excluding the effects of the tax hike, core CPI inflation is estimated to be at around 0.4 percent in December. Meanwhile, the BOJ's preferred measure of core inflation—excluding fresh food and energy—exhibited a modest upward trend on account of an increase in prices in food products and services amid tight labor market conditions and a positive output gap, while staying at around 0.5 percent. Medium-term inflation expectations have been stable at around 1 percent. Going forward, consumer price inflation is expected to hover at around 0.6 percent in FY2019 and 0.5 percent in FY2020,[5] well below the BOJ's 2 percent target (Figure 4).

Figure 3. Nominal Wage Growth



Note: Based on the constant sample.
Source: MHLW

Figure 4. CPI Inflation and Inflation Expectations



Note: The effects of consumption tax hikes are excluded.
Source: Ministry of Internal Affairs and Communications; BOJ; Consensus Economics; Haver Analytics

[2] This report contains some data and authorities' projections that became available in January 2020 after the cut-off date, including monthly labor market and consumer price indicators for December 2019, the BOJ's Outlook for Economic Activity and Prices, and the Cabinet Office's Annual Report on National Accounts for 2018 and Economic and Fiscal Projections for Medium to Long term Analysis.
[3] Based on "employees", not inclusive of self-employed and family workers.
[4] Based on the Ministry of Health, Labour and Welfare (MHLW)'s constant sample data with continuing observations. The constant sample data with continuing observations have a drawback with limiting number of the sample, but provide timely and comparable wage statistics with monthly frequency.
[5] The CPI inflation projections for FY2019 and FY2020 exclude the one-off effects of the consumption tax hike implemented in October 2019 and policies concerning the provision of free education.

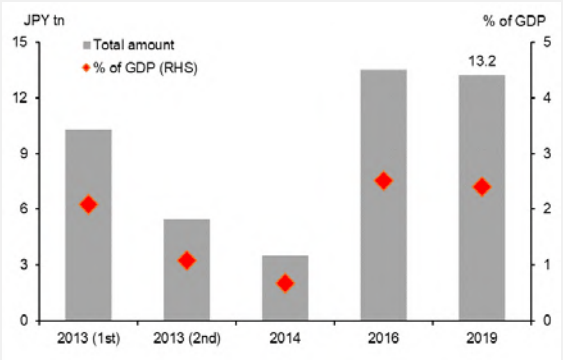
Authorities' Views

6. **The authorities' near-term growth and inflation outlooks are more optimistic than those of AMRO.** The BOJ is of the view that the economy is likely to continue displaying an expanding trend through FY2021 as the impact of the slowdown in overseas economies on domestic demand is expected to be limited. The real GDP forecast released in January 2020 is 0.8 percent in FY2019 and 0.9 percent in FY2020. On inflation, the BOJ forecast the FY2019 CPI (less fresh food) inflation at 0.4 percent, and FY2020 at 0.9 percent, excluding the effects of the consumption tax hike and policies concerning the provision of free education in 2019. Meanwhile, in December 2019, the Cabinet Office projected real GDP to grow by 0.9 percent in FY2019 and by 1.4 percent in FY2020, while forecasting CPI inflation (all items) at 0.6 percent and 0.8 percent in FY2019 and FY2020, respectively. This outlook includes the impact of the new economic policy package, which is estimated to raise real GDP by 1.4 percent over three years. It assumed a stronger growth in private consumption underpinned by an improvement in employment and income conditions as well as in business investment as firms continue to run into production capacity constraints and labor shortages.

Box A. Initial Assessment of the Government's New Fiscal Stimulus Package[6]

In December 2019, the government announced new economic measures. The size of the fiscal stimulus package amounted to JPY13.2 trillion, which is comparable to that of the 2016 stimulus package (Figure A1). The new stimulus package consists of three main pillars: i) recovery and reconstruction from natural disasters, including infrastructure investment projects; ii) subsidies to the private sector including small and medium-sized enterprises (SMEs), agriculture, forestry and fishery industries, regional economies and "employment ice age" generation;[7] and iii) investment for future growth potential beyond the 2020 Tokyo Olympics and Paralympics, including promoting Society 5.0 and R&D investment, and a new measure to support private consumption which utilizes Individual Number Card from September 2020 to the end of March 2021. Of the total size of JPY13.2 trillion, the government's budget expenditure accounts for JPY9.4 trillion while the rest is to be financed by Fiscal Investment and Loan Program (FILP) loans.

Figure A1. The Size of Fiscal Stimulus Since 2013



Note: The coverage of each fiscal stimulus varies. For example, local government expenditures are included in 2016 and 2019, but not in 2013 and 2014.
Source: Cabinet Office; AMRO staff calculations

Table A1. The 2019 New Fiscal Stimulus Package

(Unit: JPY trillion)

Key pillars and financing scheme	Sub-Total	Fiscal Expenditure		Total Size (incl. private investment)
		Budget	Off budget item (FILP)	
1. Recovery & reconstruction from natural disasters	**5.8**	5.4	0.3	7.0
2. Subsidies to industries and households to offset downside risks to the economy	**3.1**	2.1	1.1	7.3
3. Investment for the future growth potential beyond the 2020 Tokyo Olympics	**4.3**	1.9	2.4	11.7
Financed by:				
Budget				
Central Government		7.6		
(FY2019)		5.1		
(FY2020)		2.6		
Local government		1.8		
Off budget item				
(FY2019)			1.4	
(FY2020)			2.4	
Total	**13.2**	**9.4**	**3.8**	**26.0**

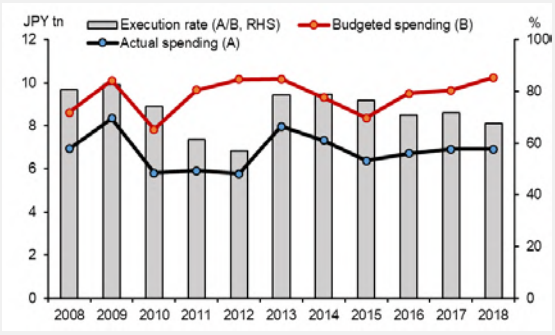
Note: Off-budget expenditures utilize the FILP (Fiscal Investment and Loan Program) that is a self-funded off-budget fund not relying on tax revenue.
Source: Cabinet Office (5 December 2019)

[6] Prepared by Jinho Choi (Senior Specialist).
[7] It refers to those who graduated from school during the period from the mid-1990s and the early 2000s when the employment environment was severe. Currently, a higher proportion of individuals in this generation is working in unstable jobs or is unemployed than in other generations.

Considering past experiences, the government's investment spending on infrastructure could be delayed due to severe labor shortages, while transfers or other spending will likely be implemented in a timely manner. Due to a severe labor shortage—especially in the construction sector—executing government spending on infrastructure will not be as smooth and speedy as the increase of the budget spending. Indeed, despite a recent pick-up in the government budget on public works, mainly driven by the 2016 fiscal stimulus package, the actual spending has not increased significantly, leading to execution rates of around 70 percent of the budget (Figure A2). In contrast, the government's transfers to the private sector or the cashless payment promotion program can be implemented as intended in a timely manner, but the size remains relatively small, compared to that of government investment in the stimulus package.

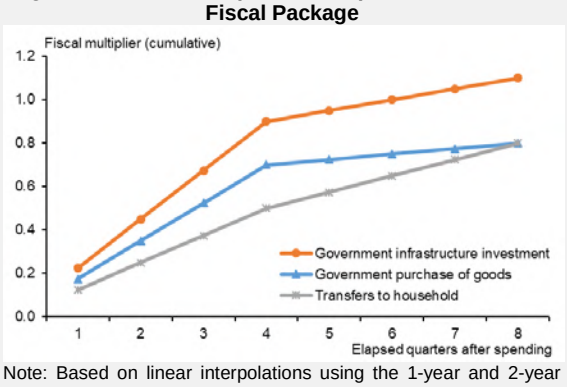
The economic impact of the stimulus package is estimated using fiscal spending multipliers. Given the importance of the fiscal stimulus package, we aim to measure its potential impact on near-term economic growth using existing studies on fiscal multipliers—a quantitative summary of the effect of fiscal measures on growth—under certain assumptions to draw some policy implications. According to a cross-country study by OECD (2009), for Japan, a 1 yen temporary and instantaneous increase in government spending on infrastructure investment would lead to a 0.9 yen increase in GDP for the first year and 1.1 yen cumulatively in the first two years. Meanwhile, a 1 yen increase in government transfers to households would result in an increase of 0.5 yen and 0.8 yen in GDP in the first year and for the first two years respectively (Figure A3). To calculate the short-term stimulus effects of the new fiscal package, we re-classified key projects of the three pillars as either government investment, or transfers to households, based on the information available so far.

Figure A2. Execution Rate for Public Work



Note: "Realized" budget includes supplementary budget and carry-overs from the previous year.
Source: JMOF; AMRO staff calculations

Figure A3. Fiscal Multipliers for Japan to Evaluate the Fiscal Package



Note: Based on linear interpolations using the 1-year and 2-year multiplier estimates for Japan by OECD (2009)
Source: OECD; AMRO staff calculations

A preliminary projection shows the new fiscal stimulus package is likely to be supportive in boosting near-term economic growth. Reflecting slow implementation (and even under-utilization) of fiscal stimulus packages in practice, it is assumed that government spending on infrastructure will be disbursed by the end of the next fiscal years after budgeting—the FY2019 supplementary budget disbursed by the end of FY2020 and the FY2020 initial budget by FY2021—while the spending on transfers to the private sector spent within one year. As a result, our 'rule-of-thumb' calculations using the fiscal multiplier estimates show the marginal effects of the new fiscal stimulus package on growth are likely to be about 0.03 percent and 0.50 percent of GDP in FY2019 and FY2020 respectively.[8] Nevertheless, if such a strong public investment leads to "crowding-out" of private investment, the magnitude of the impact on growth will be reduced to some extent. As a caveat, our preliminary projections should be considered as the upper bound for the short-term stimulus effects as they rely on the OECD's fiscal multipliers, which are on the higher side among the estimates. To sum up, such

[8] According to a recent survey by Bloomberg, market economists expected that the new fiscal stimulus package will add 0.35 ppts (median forecast) to economic growth in FY2020, which is broadly in line with our estimate.

spending would be helpful to support near-term growth even if private consumption weakens further after the sales tax hike amid weak consumer sentiment.

In order to maximize the effect, the new stimulus measures should be implemented in a well-disciplined, targeted and timely manner. Such infrastructure-related spending would be necessary to restore the economies of the regions that were impacted by the recent natural disasters and strengthen buffers against future disasters, one of Japan's key perennial risks. In the longer term, it will also contribute to smoothening Japan's volatile growth fluctuations caused by frequent natural disasters each year. At the same time, the authorities should be mindful that the effects of the fiscal stimulus on economic growth are maximized when new spending is implemented in a well-targeted and timely manner. This will be able to boost economic growth and help improve Japan's fiscal balance. Moreover, the authorities should ensure the maintenance of fiscal disciplines with reference to the medium-term consolidation plan.

A.2 External Sector and the Balance of Payments

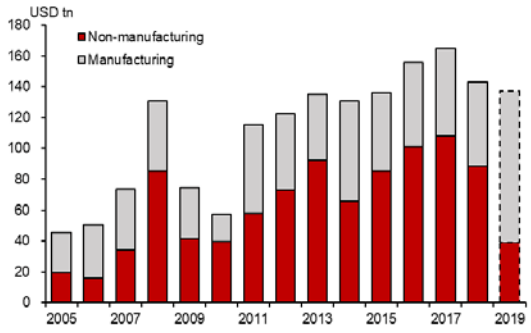
7. **Merchandise export has continued to decline sharply in 2019, negatively affected by the slowdown in China and escalating U.S.-China trade tensions.** Since December 2018, merchandise exports have declined amid weak external demand. Exports contracted by 5.5 percent yoy in the first 11 months of 2019, compared to a 4.9 percent growth in the same period in 2018. By destination, exports to China and ASEAN fell significantly. In particular, Japan's capital goods exports to China posted a sharp decline across the board amid the slowdown in China. Exports to the U.S. remained relatively firm, but has started to turn negative since August 2019, mainly led by automobiles and machinery exports. Meanwhile, imports also showed a decline of 5.0 percent in the first 11 months of 2019, deteriorating from 10.5 percent growth in the same period in 2018.

8. **Japan's external position has remained strong with a sizable current account surplus, supported by large primary income earnings.** As a matured creditor nation, the source of Japan's current account surplus is largely interest and dividend incomes earned from its large overseas investments. In the first three quarters of 2019, the primary income surplus amounted to JPY15.9 trillion (3.9 percent of GDP), reflecting Japan's large overseas investment position. The goods trade balance turned into a negative JPY0.3 trillion due to a decline in exports, which were adversely affected by the U.S.-China trade tensions and the slowdown in China. Meanwhile, the service account deficit has gradually improved in recent years, largely due to increasing receipts from intellectual property rights, inbound tourism and other business services (See Box B. *Current Account Surplus in Japan: From Tangible To Less Tangible*).

9. **Meanwhile, the financial account has been driven by residents' outward investments in search of higher returns.** Outward FDI flows remained heightened during the first three quarters of 2019, mainly driven by Japanese companies' cross-border mergers and acquisitions (M&A), especially in the non-manufacturing sector (Figure 5; See Selected Issue 4. *Trends in Japan's Outward FDI*). Portfolio investments also continued to record net outflows during the same period, mainly on the back of purchases of foreign stocks and bonds by Japanese investors. Meanwhile, foreign investors steadily increased their investments in the Japanese Government Bonds (JGBs).

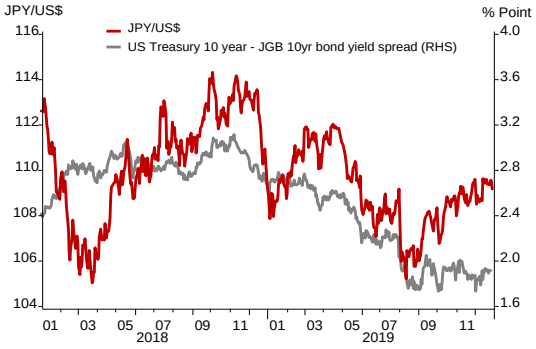
10. **In 2019, the JPY came under appreciation pressure, before shifting to a gradual weakening trend toward the end of the year.** From April to August 2019, the JPY appreciated significantly against the U.S. dollar amid trade tensions between the U.S. and China, driven by a compression in interest rate differentials (Figure 6). Since September, the JPY has depreciated, reflecting a moderation in trade tensions, lower expectations of further easing by the Fed and strong FDI and portfolio outflows. In recent years, the JPY has been more range-bound in its movements, as the yen appreciation pressure from its large current account surplus and Japanese investor's U.S. dollar demand for overseas investments are more balanced.

Figure 5. Outward FDI by Industry



Note: The 2019 figures are based on the January to June period.
Source: JETRO; JMOF; BOJ

Figure 6. JPY and Interest Rate Differentials

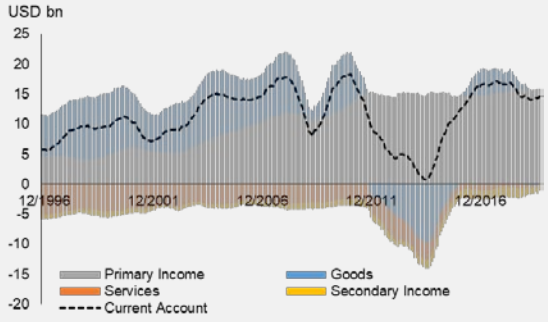


Source: Federal Reserve Board; BOJ

Box B. Current Account Surplus in Japan: From Tangible To Less Tangible[9]

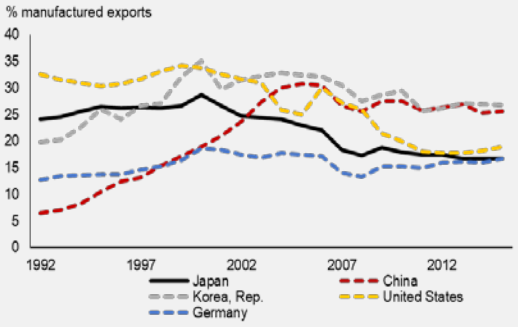
The sizable overseas investments and off-shoring of production by Japanese corporates over the past three decades have been key in the restructuring of the balance of payments from one dominated by trade surpluses to one dominated by investment incomes. Continued overseas investments by Japanese businesses and residents have been driven by several factors including the U.S.-Japan trade frictions in the 1980s, the appreciation of the Japanese yen during 1985 to 1995, the preferential policies in host countries to attract investment, and growing demand from overseas markets. The overseas expansion over time has been accompanied by rising investment returns from direct and portfolio investments, while direct exports from Japan have declined over the years. Meanwhile, to maintain domestic manufacturing and sustain export competitiveness, there have also been ongoing policy efforts to reignite domestic economic growth through Research and Development (R&D), targeting advanced manufacturing. This box tries to provide snapshots of such dynamics from the perspective of the current account balance.

Figure B1. Current Account



Note: 12-month moving average.
Source: BOJ

Figure B2. High-tech Goods Exports



Source: The World Bank

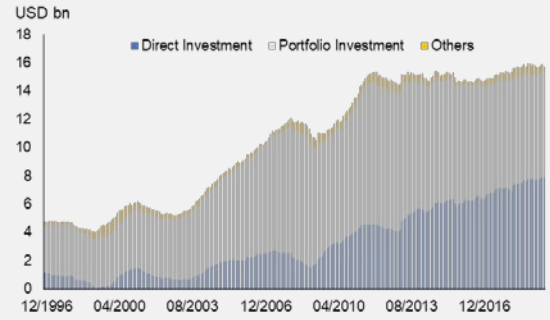
[9] Prepared by Xianguo Huang (Economist).

Japan's trade surplus has narrowed over the years, due to global competition and the outsourcing investment strategies of Japanese manufacturers. Japan's share of high-tech goods exports out of its total exports has started to decline since the early 2000s, with increasing competition from neighboring countries. For instance, Japanese firms have lost share in the global market in sectors such as consumer electronics. On the other hand, sectors, such as the automotive industry, have continued to witness the success of Japanese brands, although the increase in sales has been more from overseas subsidiaries rather than domestic production and exports. Some high-end models have continued to be produced in Japan, however, and they have contributed to export growth. In addition, and more broadly, many Japanese firms have continued to leverage on their advanced technologies in many areas and played a strategic role in the global supply chain.[10] In addition, the 2011 earthquake also had a significant impact on Japan's trade surplus as it has led to the importation of larger amounts of fossil fuels to compensate for losses in nuclear energy production.

Supported by continuous overseas investments through direct and portfolio flows by Japanese businesses and residents for decades, the primary account surplus has become the primary driver in the current account surplus of Japan. Primary income has increased steadily from USD71.4 billion in 2000 to USD122.3 billion in 2006 when it became larger than the trade surplus. The latter declined from USD118 billion to USD95.1 billion in the same period. With the trend continuing, the trade surplus declined to USD11.2 billion while the primary income surplus grew to USD189.1 billion, according to the latest figure in 2018.

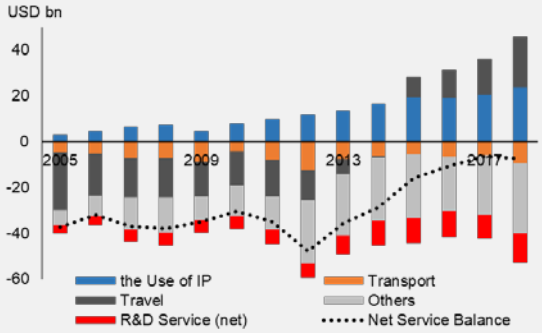
While the portfolio investment incomes remain a major source of primary account surplus, direct investment earnings have continued to expand over the past decade. The growing direct investment earnings—which accounted for less than one-fifth of primary income in 1999—reached half of the primary incomes in 2019. The incomes from the foreign direct investment has been broadly associated both with manufacturing, such as automobiles, chemicals and pharmaceuticals and non-manufacturing activities, such as wholesale, retail and financial services. In 2018, the direct investment incomes from overseas manufacturing and non-manufacturing stood at USD61 billion and 64.1 billion, respectively. In contrast, inward direct investment has mainly generated returns from the finance and insurance sector, totaling around USD21.3 billion.

Figure B3. Primary Account



Note: 12-month moving average.
Source: BOJ

Figure B4. Net Services



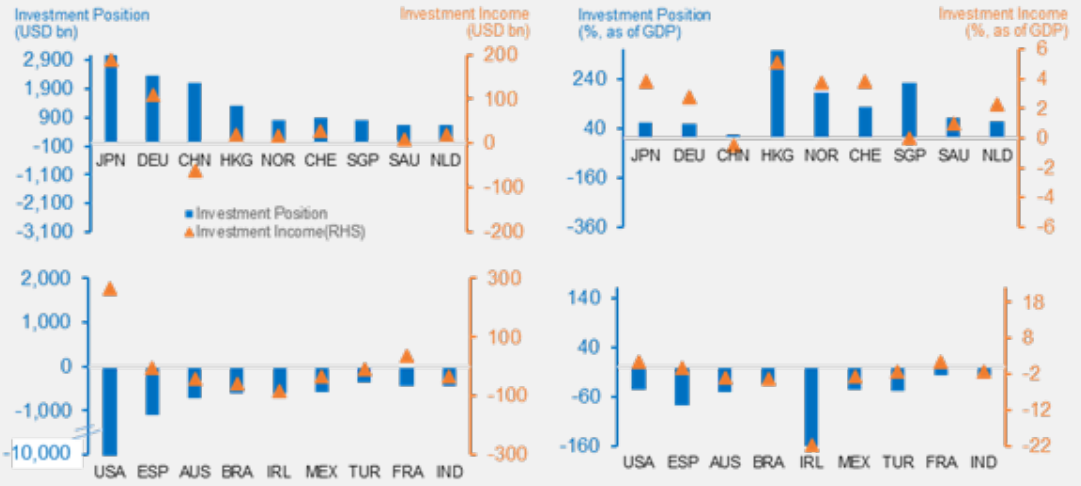
Source: BOJ

Compared with other countries, Japan has remained the largest investor in terms of net investment assets and investment incomes. In 2018, Japan's net investment assets reached USD3.1 trillion, ranking highest globally, ahead of Germany (USD2.4 trillion), and China (excluding Hong Kong) (USD2.1 trillion). Japan's net investment assets amounted to 62 percent of GDP. Its investment incomes, valued USD189.1 billion, was also ahead of other countries except the United States. In comparison, the United States held the largest negative investment position globally—

[10] For instance, Japanese firms are major suppliers of some critical materials in manufacturing chips. As a result, any disruption in production or delay in export shipments from Japan would lead to repercussions in the related global value chains.

Figure B5. Net Investment Position and Income (2018)

(a) In terms of USD billion (b) In terms of GDP



Note: The chart includes the top and bottom nine countries in net investment positions. The abbreviations by order stand for Japan. Germany, China, HK (China), Norway, Switzerland, Singapore, Saudi Arab, Netherland in the first row, and the United States, Spain, Australia, Brazil, Ireland, Mexico, Turkey, France, and India in the second row, respectively.
Source: IMF

valued at USD 9.6 trillion in 2018—despite its positive investment income which is the highest in value.

In addition to a growing investment income surplus, the service account deficit has been narrowing. This has been driven by royalties from Intellectual Property Rights (IPR) and receipts from growing tourism arrivals. As for the IPR royalties, outgoing direct investment has been accompanied by the payment for using IPR from parent companies and IPR fees paid by other third-party foreign companies, mainly in automotive and high-tech manufacturing. In the tourism sector, government policies have become more accommodating and aimed at increasing tourist arrivals. As a result, the number of foreign visitors has increased from 10.4 million in 2013 to 31.2 million in 2018, while the number of Japanese travelers going overseas has increased from 17.4 million to only 19 million in the same period. Japanese authorities are currently targeting 40 million arrivals in 2020 and 60 million visitors a year by 2030 as they aim to make tourism a key growth engine of the economy. Separately, the R&D expenses of Japanese firms paying overseas have also been increasing since 2013, partly incentivized by tax credits.

Going forward, the current account position in Japan is likely to remain in a sizable surplus, supported mainly by a huge primary surplus and partly by an improving services balance. Moving forward, the goods trade balance will likely remain in a small surplus in the short term, supported by the development of advanced manufacturing in the medium term. Given the huge investment stock, and the good return performance, investment income will continue to be the key driver for the current account surplus. The changes in secondary service account—which could turn into a surplus in the foreseeable future and further support the current account balance—will be driven by more IP charges from broader applications such as medical care and robotics, and the booming tourism sector.

A.3 Monetary Condition and Financial Sector

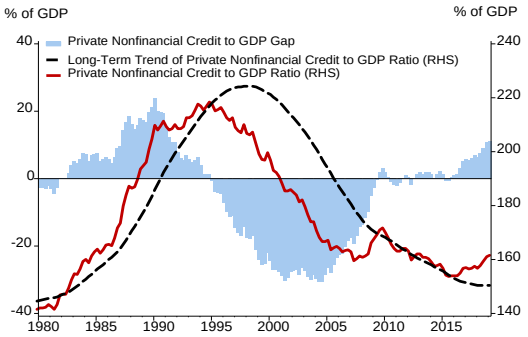
11. **Credit growth remains relatively robust, reflecting easy monetary conditions.** The monetary base continued to expand at around 3.5 percent in 2019. The growth in bank loans slowed slightly to 2.5 percent during the first ten months of 2019 from 2.7 percent in the same period of 2018. Loans to corporates grew by 2.9 percent, while loans to individuals expanded

by 2.3 percent from January through October 2019. Loans to the real estate sector grew by 3.8 percent in the same period, albeit on a moderating trend. The private non-financial credit-to-GDP ratio has also continued to recover while widening the gap against its long-term trend, suggesting the credit cycle is still expansionary (Figure 7).

12. **The JGB yield curve flattened temporarily in Q3 2019 amid low global interest rates, and stock prices were range-bound through August 2019 before rising toward the end of the year.** 10-year JGB yields fell below minus 0.2 percent in August 2019 in tandem with the decline in global bond yields, leading to a flattening of the yield curve and heightened expectations of further easing by the BOJ. However, the 10-year JGB yields have risen above minus 0.2 percent since early October 2019 in tandem with the rise in global interest rates, combined with reduced market expectations on the BOJ's further easing. The announcement of the new fiscal stimulus package in early December 2019 also prompted yields to rise significantly. Meanwhile, stock prices have moved closely with global factors such as the U.S.-China trade tensions, despite weaker corporate earnings. Stock prices remained range-bound through August 2019 before showing a strong rally.

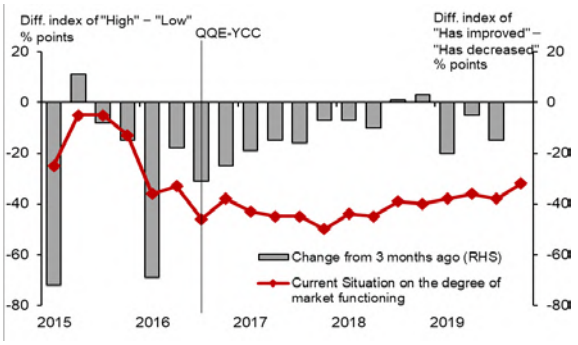
13. **Amid continued monetary easing, the JGB's market functioning remains limited.** The BOJ further strengthened its commitment to monetary easing in October 2019 with a new forward guidance, according to which, policy rates are expected to remain at their present or lower levels for as long as it is necessary to pay close attention to the possibility that the momentum toward achieving the price stability target will be lost. Amid prolonged monetary easing, the BOJ's survey indicates that the bond market's functioning remains unsatisfactory to a majority of participants, although it is improving (Figure 8). Other indicators on JGB market liquidity—the feasibility of making deals with expected prices, the availability of making deals with expected lots, bid-ask spreads and the volume of orders at the best-ask price—have shown some signs of deterioration in liquidity in the first three quarters of 2019, while the dealer-to-client transaction volume has recovered from a multi-year low.

Figure 7. Private Non-financial Credit to GDP



Note: On the basis of market values.
Source: Bank for International Settlements (BIS)

Figure 8. Bond Market Survey



Source: BOJ

14. **The financial system has remained sound although financial institutions are struggling with low profitability.** In aggregate, the banking sector has sufficient capital buffers, while non-performing loan ratios have stayed low at around 1 percent (Table 1). However, the ultra-low interest rate environment has squeezed banks' net interest margins, exerting

downward pressure on profitability, especially that of regional banks, which depend mostly on domestic lending. To offset declining net interest margins, major banks have been expanding their overseas lending, and are investing in foreign securities including structured credit products. Meanwhile, regional banks are continuing to extend loans to small firms, albeit at a slower pace. A silver lining for regional banks is that some of them are increasingly diversifying their businesses to fee-based services and taking up other business opportunities to secure more steady income streams. In addition, there has been collaboration among top-tier regional banks as the industry starts to consolidate. Meanwhile, life insurance companies and pension funds have been increasing their overseas investments, albeit mostly in high-grade bonds, in search of yields.

Table 1. Selected Financial Soundness Indicators

	(End-of-period, in percent)	2016Q1	2016Q3	2017Q1	2017Q3	2018Q1	2018Q3	2019Q1
Capital adequacy	Regulatory Capital to Risk-Weighted Assets	15.9	16.2	16.0	16.7	17.1	17.0	17.2
	Regulatory Tier 1 Capital to Risk-Weighted Assets	13.3	13.4	13.5	14.2	14.9	14.8	15.1
	Non-performing Loans Net of Provisions to Capital	11.5	10.9	9.0	8.1	7.6	7.4	7.6
Asset quality	Non-performing Loans to Total Gross Loans	1.5	1.4	1.3	1.2	1.1	1.1	1.1
Profitability	Return on Assets	0.3	0.3	0.2	0.3	0.2	0.3	0.1
	Return on Equity	6.9	8.3	5.1	8.1	5.4	7.3	2.3
	Interest Margin to Gross Income	60.4	61.0	62.6	59.9	62.2	60.8	70.4
	Non-interest Expenses to Gross Income	62.8	62.1	67.8	65.3	69.0	64.5	82.7
Liquidity	Liquid Assets to Total Assets (Liquid Asset Ratio)	27.2	27.1	28.7	28.7	29.6	29.3	29.4
	Liquid Assets to Short Term Liabilities	49.1	48.2	49.7	49.3	49.9	49.4	49.2
Other indicators	Total Loans (non-interbank) to Customer Deposits	74.9	74.0	73.3	72.9	71.7	72.2	71.7
	Corporate Loans to Total Gross Loans	36.7	37.3	36.8	36.8	36.7	36.8	37.2
	Residential Real Estate Prices	0.4	2.2	4.5	2.1	1.7	2.4	1.7
	Commercial Real Estate Prices	4.8	0.9	2.8	4.2	4.1	3.6	0.7

Source: IMF Financial Soundness Indicators (FSI) Database

A.4 Fiscal Sector

15. **Revenues increased strongly in FY2018 on the back of solid economic growth, but is expected to underperform in FY2019.** In FY2018, ending in March 2019, tax and stamp revenues increased by 2.7 percent, reaching JPY60.4 trillion, higher than the budget estimate of JPY59.9 trillion. Personal income tax revenue increased 5.4 percent owing to a moderate increase in wages, reflecting the tight labor market conditions. Corporate tax revenue increased 2.7 percent, on account of strong corporate profits. Consumption tax revenue, meanwhile, increased by 1 percent amid modest growth in private consumption. However, in FY2019, total revenues are expected to fall slightly short of the budgeted amount, mainly due to underperformance in personal and corporate income tax collections despite the consumption tax hike.

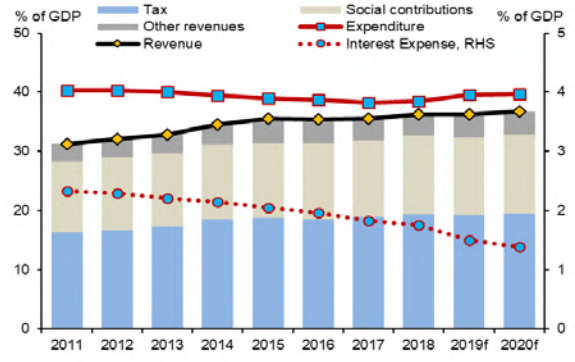
16. **Expenditure has been under control, but is expected to pick up in FY2019, owing to the government's fiscal stimulus package.** The government's expenditure discipline and lower interest payments had constrained the annual growth of total spending to 0.2 percent on average during the period FY2013-2017. However, total expenditure expanded by 0.9 percent in FY2018 as a result of the two supplementary budgets to cope with the after-effects of the natural disasters.[11] Moreover, according to the FY2019 supplementary budget, total spending[12] is estimated to expand by 5.7 percent vis-à-vis the actual FY2018 budget, boosted by the

[11] Based on the supplementary budgets in FY2018 and FY2019.
[12] Based on general expenditure, excluding national debt service, local allocation tax grants, etc.

government's new fiscal stimulus package worth of JPY13.2 trillion to safeguard against natural disasters and to secure future growth. Main expenditure items in the fiscal stimulus include infrastructure investment projects for disaster prevention, subsidies to the private sector including SMEs, agriculture, forestry and fishery industries, and programs for Society 5.0 and R&D investment to lift long-term growth.

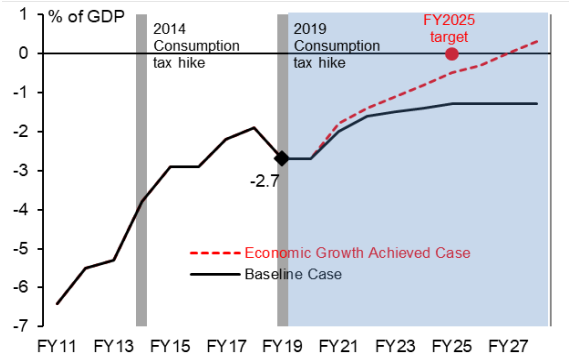
17. **Although the fiscal balance has been on a gradual consolidation trend, the deficit is expected to widen in FY2019 and FY2020, owing to higher spending under the fiscal stimulus package.** Owing to higher growth in tax revenues and sustained expenditure discipline, the fiscal deficit narrowed from 3.3 percent in FY2015 to 2.7 percent in FY2017, and further to 2.2 percent in FY2018. Going forward, driven by the new fiscal stimulus package, the overall fiscal deficit is projected to widen significantly to 3.2 percent in FY2019 before narrowing slightly to 3.0 percent in FY2020. This will have negative impact on the government's medium-term consolidation plan, resulting in the reduced likelihood of achieving the primary balance target by FY2025.

Figure 9. Revenue and Expenditure (General Government)



Note: Based on the fiscal year. The general government includes the central and local governments and social security funds. FY2019-2020 figures are based on AMRO staff projections.
Source: Cabinet Office, AMRO staff projections

Figure 10. Primary Balance (Central and Local Government)



Note: Based on the central and local governments, excluding the fiscal resources for recovery and reconstruction measures.
Source: Cabinet Office (January 2020)

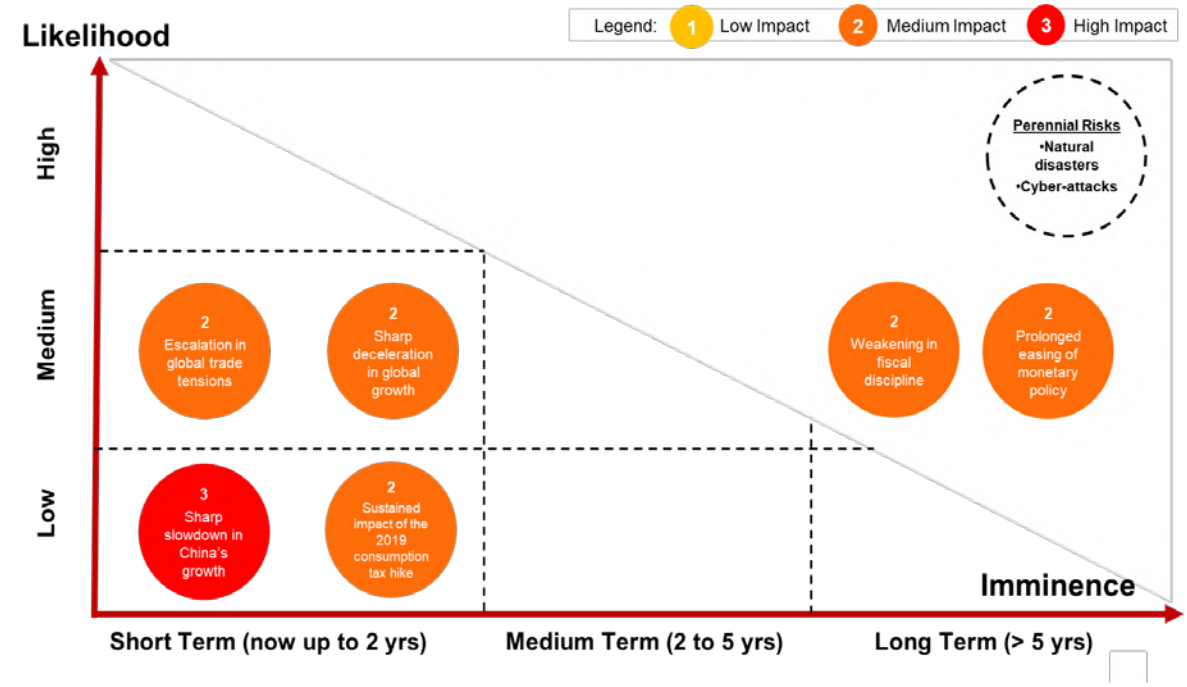
18. **Economic policies have continued to focus on supporting growth and reform efforts.** In June 2019, the government announced the "Basic Policy on Economic and Fiscal Management and Reform 2019" to establish a system suitable for the age of "Society 5.0" and to expand the virtuous cycle of economic revitalization and fiscal consolidation.[13] To this end, the "Action Plan of the Growth Strategy" was adopted to promote: i) realization of "Society 5.0"; ii) reforms to the social security system for all generations; and iii) reinforcement of regional measures under population decline. To dampen demand fluctuations from the consumption tax hike, the government has implemented temporary offsetting measures, including a cashless payment promotion program, premium voucher program and tax reductions for purchasing durable consumer goods such as housing. In addition, a reduced tax rate for certain goods, such as food and beverages, was introduced along with the consumption tax hike.

[13] The key points are as follows: 1) Securing employment opportunities up to the age of 70; 2) Exemption of anti-trust laws to promote integration in regional financial institutions; 3) Early increase of minimum wage to 1,000 yen per hour; 4) Building the transparent rule for data transactions; 5) Consumption tax hike to 10 percent; and 6) Social security benefits and burdens will be reviewed in 2020.

B. Risks, Vulnerabilities and Challenges

19. **The Japanese economy is confronted with downside risks in the near term, mainly from external factors, following robust expansion over the past five years.** The Country Risk Map (Figure 11) summarizes AMRO staff's qualitative assessment of key risk factors in terms of the likelihood of occurrence (vertical axis), imminence (horizontal axis) and the size of potential impact (circle color). Among near-term risks, a sharper-than-expected slowdown in China could have the highest impact on the Japanese economy should it materialize, although the chance is low. Both, the re-escalation in global trade tensions as well as a sharper-than-expected slowdown in global growth remain key risk factors with medium likelihood and a medium impact on the growth outlook. On the domestic front, the sustained impact of the consumption tax hike in 2019 may have a medium impact on economic growth, albeit with low probability owing to the government's offsetting measures. Structural challenges include population aging, weakening in fiscal discipline and prolonged monetary easing that could undermine Japan's long-run growth and stability. Meanwhile, important perennial risks include frequent occurrences of natural disasters, and cyber-attacks targeting personal financial information.

Figure 11. Japan: Country Risk Map



Source: AMRO staff assessment

B.1 Near-term Risks to the Macro Outlook

20. **Japan's key near-term risks include a sharp slowdown in China, the re-escalation of U.S.-China trade tensions, a sharper-than-expected slowdown in global growth and a prolonged impact of the consumption tax hike:**

- **A sharper-than-expected slowdown in China.** China is Japan's major export destination (19.5 percent of total exports in 2018) and outbound FDI recipient (6.8 percent). Despite the economic stimulus measures, a sharper-than-expected economic slowdown in China will weaken Japanese companies' exports, particularly of machinery, electrical machinery and chemicals, as well as investment.
- **Continued trade protectionism, including U.S.-China trade tensions.** Japanese corporates in general have the capacity to deal with challenges posed by trade protectionism, through their global production bases and diverse markets. However, given Japan's significant contribution to China's value-added exports to the U.S., a reduction in China's trade due to the ongoing U.S.-China trade tensions would dampen Japan's manufacturing production and exports, especially IT-related intermediate good products, through the global value chain (GVC). Moreover, despite the recent completion of the U.S.-Japan trade deal, the potential 25-percent tariffs on Japan's auto sector have not been fully eliminated and remain a risk.
- **A sharper-than-expected deceleration in global growth.** Abrupt heightening of concerns over a global recession may worsen market sentiment and trigger large price adjustments in the foreign exchange and financial markets. Excessive JPY appreciation could lead to generating disinflationary pressures, and reduce Japanese firms' repatriated yen-denominated profits.
- **Prolonged impacts of the consumption tax hike.** It is anticipated that swings in private consumption will likely be smaller than in the case of previous tax hikes, owing to the government's offsetting measures. Consumer sentiments have bottomed out since September 2019 after several months of steady deterioration (Figure 12). However, monthly consumption indicators are broadly comparable to those of the 2014 tax hike, albeit affected by disruptions in consumption from typhoons in October (Figure 13), which would imply that the risk of a prolonged weakness in private consumption cannot be precluded. Moreover, there could be some extended weakness in private consumption after the expiry of some of the government's temporary stimulus measures, including premium vouchers for low-income households, which are set to expire in 2020. On the positive side, the Tokyo Olympic and Paralympic Games in July-August 2020 and the introduction of a new reward point program using Japanese social security numbers from September 2020 may provide some support to private consumption (See Box C. *Impact of Japan's Recent Consumption Tax Hike on its Economy*).

Figure 12. Consumer Confidence around Recent Tax Hike Episodes

Source: Cabinet Office; AMRO staff calculations

Figure 13. Private Consumption around Recent Tax Hike Episodes

Note: Based on the BOJ's Consumption Activity Index (real terms, adjusting travel balance).
Source: BOJ; AMRO staff calculations

Box C. Impact of Japan's Recent Consumption Tax Hike on its Economy[14]

The Japanese government hiked its consumption tax from 8 to 10 percent in October 2019[15], along with the introduction of a reduced tax rate for certain goods, such as food and beverages, and other temporary mitigating measures. The new rate applies to nearly all goods and services, barring most food and beverages. Almost half of the additional revenues from the tax hike will be allocated to finance free early childhood education and to enhance the social security system. To alleviate the adverse impacts of the tax hike on private consumption, the government has set aside JPY2.3 trillion as temporary and special budget measures (Table C1). In addition, mitigating measures will be taken to cope with natural disasters (disaster prevention, disaster mitigation and building national resilience) and to directly support private consumption (point rewards for cashless payment, budgetary measures for housing purchasers, vouchers with premiums for the low-income and child-rearing households, and tax credit measures).

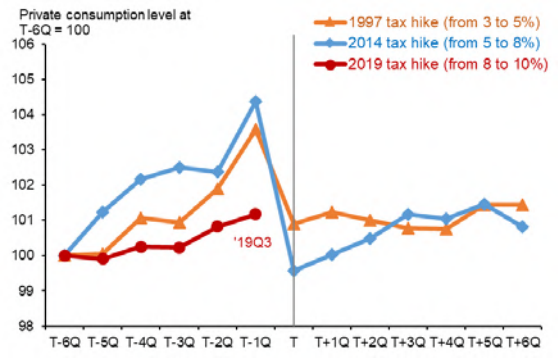
Table C1. Countermeasures to Mitigate Adverse Impacts of the Consumption Tax Hike

Measures	Amount	Descriptions
Temporary and Special Measures: JPY2.0 trillion		
Point rewards for cashless payment	JPY279.8 billion	• Reward points will be given for cashless payments through June 2020. • The rebate rates will be 5 percent at small and medium-sized stores and 2 percent at major chain stores.
Vouchers with premiums	JPY172.3 billion	• Low-income families and families with children under 3 years old are able to purchase a voucher worth JPY 25,000 for the cost of JPY 20,000.
Support for purchasing houses	JPY208.5 billion	• Benefit for housing purchase "Sumai Kyu-fu Kin", to a maximum of JPY500,000. • Rewarding points for innovative housing, worth JPY300,000.
Disaster mitigation and building national resilience	JPY1,347.5 billion	• Three-year Emergency Response Plan for Disaster Prevention, Disaster Mitigation, and Building National Resilience.
Tax Credit Measures: JPY0.3 trillion		
Expansion of housing loan tax credit		• The period of mortgage tax cut for the buyers of houses by December 2020 will expand from 10 years to 13 years.
Reduction of tax burden on automobiles		• The reduction of some taxes related to automobiles will be applied for the buyers of automobiles.

Source: JMOF

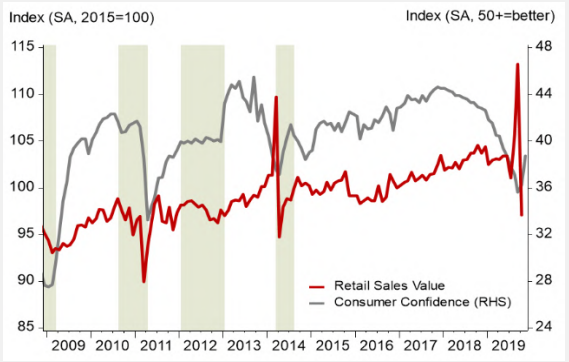
[14] Prepared by Chanvanny Dy (Associate) and Jinho Choi (Senior Specialist).
[15] The consumption tax was firstly introduced in 1989 (rate of 3 percent), and it has been increased three times since. It was first increased in April 1997 to 5 percent and then to 8 percent in April 2014. The second increase sought to cover rising social welfare costs linked to Japan's aging population. There were plans to increase it to 10 percent in October 2015, but the government delayed the hike to 10 percent twice, first to April 2017 and then October 2019. The consumption tax was increased from 8 to 10 percent in October 2019.

Figure C1. Private Consumption around the Previous Tax Hikes



Source: Cabinet Office; AMRO staff calculations

Figure C2. Consumer Sentiment and Retail Sales

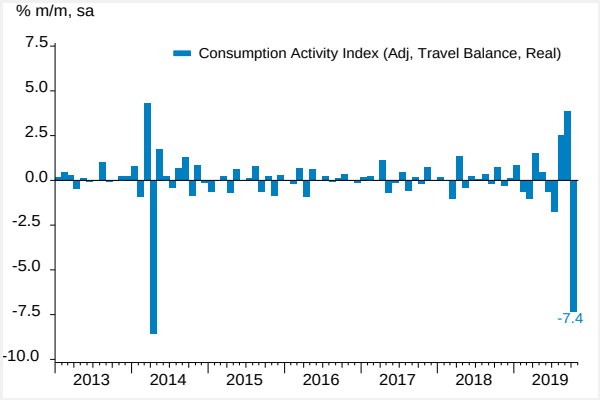


Source: Ministry of Economy, Trade and Industry; Cabinet Office; Haver Analytics

The reduced tax rate and other countermeasures are mainly motivated by the sharp decline in private consumption and consumer sentiment in the previous rounds of consumption tax hikes. In 1997, when the consumption tax increased from 3 percent to 5 percent in April and financial crisis occurred in November, Japan suffered a brief recession. Again, when the consumption tax was raised from 5 to 8 percent in 2014, the economy was expected to be heading out of deflation spurred by growth recovery, but only to be stalled by a sharp drop in private consumption after the tax hike (Figure C1). Moreover, consumer sentiments have not recovered fully even until now to the peak level of September 2013 (Figure C2). Such traumatic experiences following past consumption tax hikes have prompted the authorities to prepare pre-emptive countermeasures to ease demand fluctuations.

High frequency data shows that private consumption fell significantly in October 2019, but the net impact of the tax hike is difficult to assess, as consumption was also badly affected by disruptions from typhoons. According to the government, households' burden from the tax hike could be fully offset by these countermeasures. Although it is very difficult to assess such an argument until sufficient data is collected, it has been widely anticipated the impact of the recent tax hike on private consumption will be less severe than in the 2014 tax hike, mainly due to: i) the 2 ppt hike in 2019 is smaller than the 3 ppt increase in 2014; ii) the introduction of the reduced tax rate for certain goods, such as food and beverages; and iii) provision of reward points for cashless payment and other mitigating measures. However, monthly consumption indicators in October 2019 show private consumption is broadly comparable to that of the 2014 tax hike, although the data is affected by disruptions in consumption due to powerful typhoons (Figure C3). Figure C4 compares consumption patterns by sub-category—durable, non-durable and services goods—around the recent tax hikes. It indicates durable goods consumption dropped more significantly in October 2019 than in April 2014, while non-durable goods were less volatile around the tax hike in 2019. It appears the countermeasures may have worked in non-durable goods. In contrast, services consumption was not affected by the tax hikes both in 2014 and 2019.

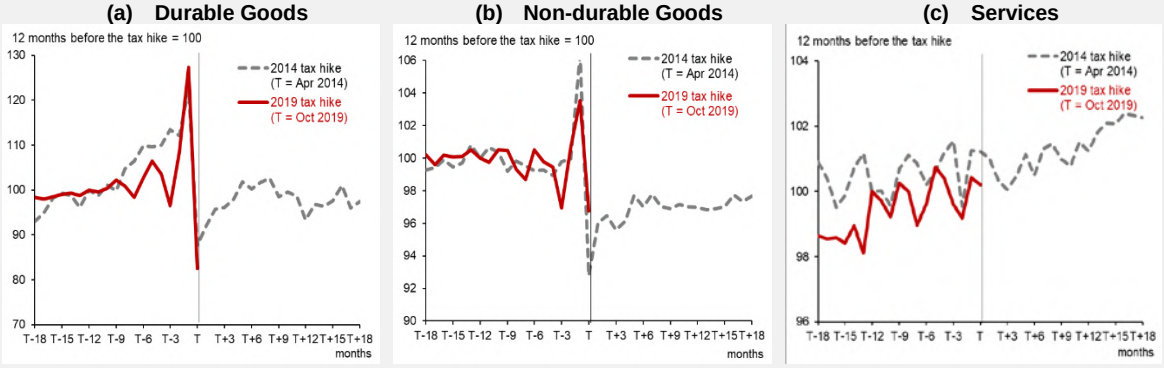
Figure C3. Consumption Activity Index



Source: BOJ

Figure C4. Consumption Activity Index by Category around Recent Tax Hike Episodes

(a) Durable Goods **(b) Non-durable Goods** **(c) Services**



Source: BOJ; AMRO staff calculations

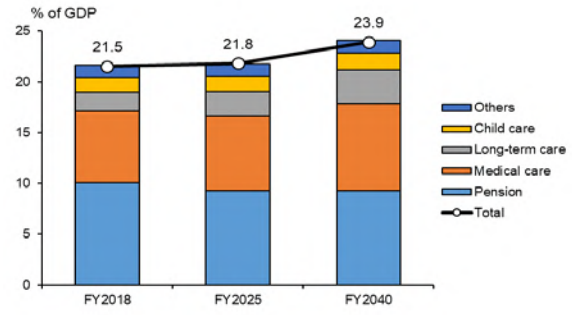
While the government's recent stimulus package will help support the economy against sluggish global economy and the negative impact of the consumption tax hike, the current weak consumer sentiments need continued monitoring. As discussed in Box A, the government's new fiscal stimulus package is expected to support near-term economic growth, mainly through public spending. Moreover, the reduced tax rate on daily use goods and the government's countermeasures will contribute toward limiting the adverse impact on private consumption to some extent. Having said that, subdued consumer sentiment, albeit having bottomed out recently, does not preclude the risk that a prolonged weakness in private consumption may occur, especially after some of the government's temporary measures expire.

B.2 Longer-term Challenges and Vulnerabilities

21. **Japan's structural challenges could undermine the economy's long-run growth and stability.** Specifically, it is exposed to:

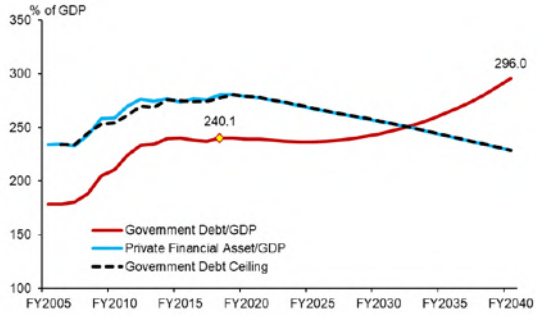
- **Demographic drag from population aging and low fertility rates.** Japan's population peaked in 2008 reflecting rapid aging and low birth rates. Unless policy measures are taken to increase productivity growth, declining population will lead to a shrinking labor force, and even negative growth with implications for the sustainability of the standard of living of the people. For instance, a growing number of small and medium enterprises (SMEs) struggle with business succession after their managements retire. Moreover, expanding social security-related spending such as medical and long-term care will pose a risk to fiscal sustainability (Figure 14).
- **Weakening in fiscal discipline.** Additional tax revenues from the two-percentage point consumption tax hike will not be fully utilized to improve the fiscal balance or reduce high government debt; instead they will be used to provide free early childhood education and to strengthen social security. Although the government debt level has stabilized at just below 240 percent of GDP since 2013, it is primarily attributable to the near zero interest rate environment which, if prolonged, could lead to a weakening of fiscal discipline. In particular, a declining trend in household savings amid population aging may shrink the domestic investor base for JGBs, which may in turn lead to an increase in the JGB interest rates and rising debt burden (See Selected Issue 1 on *Will Japan's Government Debt Reach its Limit?*)

Figure 14. Long-term Projection for Social Security Expenditure



Source: MHLW (May 2018)

Figure 15. Government Debt and its Limit Under 'Low Growth' Scenario



Note: Based on the methodology by Hoshi and Ito (2014).
Source: Cabinet Office; AMRO staff estimates

- **Prolonged easing of monetary policy.** Despite continued monetary easing, inflation has remained well below the BOJ's price stability target of 2 percent, and risks to the financial sector are growing. Real estate loans in terms of GDP have reached a record high for the post-bubble period. The actuarial soundness of life insurers may be eroded in the low interest rate environment as a result of the duration mismatch between their assets and liabilities. This problem is even more severe for those that have large annuity policies offering guaranteed returns (See Selected Issue 3 on *Low Interest Rate Environment Pushes Life Insurers to Rebalance Portfolios and Tackle Different Mix of Risks and Challenges*). Meanwhile, financial institutions are struggling with the very narrow interest rate margins. In particular, many lower-tier regional banks have thin capital buffers and their declining profitability can be attributed not only to low interest rates but also to conservative and inefficient business operations, demographic challenges and subdued economic activity in the local prefectures (See Selected Issue 2 on *Declining Profitability of Regional Banks and the Way Forward*). Finally, the low interest rate environment and the BOJ's massive asset purchase program could impair the price discovery function of the JGB and stock markets.

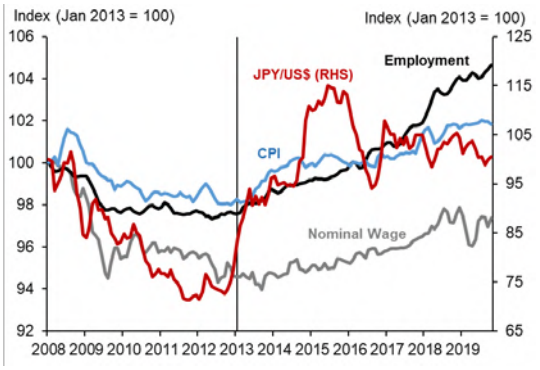
Authorities' Views

22. **The authorities largely agreed with AMRO's assessment of short-term risks and structural challenges, but have divergent views on some of the risk factors.** They opined that the additional tariffs on Japanese automobiles and auto parts will not be imposed based on the Joint Statement between Japan and the U.S., while AMRO staff still consider this as a risk. With regard to the impact of the consumption tax hike, they pointed out that consumer sentiments have bottomed out since September 2019. Moreover, in the second half of 2020, Tokyo Olympic and Paralympic Games will help sustain the growth momentum while additional stimulus measures will be implemented. With regard to the domestic investor base for JGBs, the authorities assessed that although population aging is in progress, based on the abundant savings in the domestic household sector, there is a potentially firm structure to absorb JGB issuance.

C. Policy Discussions and Recommendations

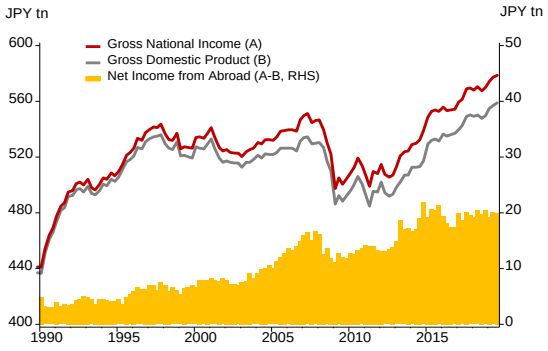
23. **Building on the achievements so far, the authorities should strengthen structural reform efforts, the so-called "third arrow" of Abenomics.** The first "two arrows" of Abenomics, easy monetary policy and flexible fiscal policy, have contributed to raising the economy's growth momentum, sustaining stable and positive inflation (Figure 16), while curbing further build-up of public debt relative to GDP. Since 2013, net income from abroad has been boosted, leading to a further widening of the gap between Japan's gross national income (GNI) and GDP (Figure 17). While this has helped to support the per capita income, the policy framework should focus on boosting the economy's growth potential by enhancing labor productivity and strengthening the services sector and "new economies" through the application of advanced digital technologies. Fiscal sustainability should be prioritized through continued efforts toward revenue mobilization and expenditure prioritization to support structural reforms.

Figure 16. Key Economic Indicators During Abenomics



Source: BOJ; MHLW; Ministry of Internal Affairs and Communications; AMRO staff calculations

Figure 17. Net Income from Abroad



Source: Cabinet Office

C.1 Restoring Fiscal Sustainability

24. **Fiscal authorities should step up efforts toward improving fiscal sustainability.** The implementation of the 2 ppt consumption tax hike, which had been postponed twice, is expected to contribute to not only securing more revenues but also maintaining the government's credibility in ensuring fiscal discipline. The offsetting measures against the tax hike should be tapered as planned, so that the additional tax revenue can be used to improve the fiscal balance. Besides the tax hike, the ongoing efforts on expenditure reforms should be strengthened by curbing public spending on projects with low economic returns, while improving the efficiency of the public sector through enhanced digitalization and automation. Extensive healthcare benefits should be carefully reviewed and controlled to maintain modest growth in social security-related expenditure.

25. **Medium-term fiscal consolidation could be more effectively pursued with a clearer roadmap under realistic macroeconomic assumptions.** In 2018, the government had set intermediate benchmark indicators[16] for the interim period FY2019-2021 before reaching a

[16] The government announced in June 2018 that the progress of "Integrated Economic and Fiscal Reforms" will be assessed with references to the interim benchmark for FY2021: i) primary deficit-to-GDP ratio at around1.5 percent; ii) public debt-to-GDP ratio at the low 180 percent-range; and iii) fiscal deficit-to-GDP ratio at 3 percent or below.

primary surplus by FY2025. Achieving this intermediate benchmark and the primary surplus target requires a well-designed action plan that can be effectively implemented. Given the projected increase in social security-related expenditures over the long term, further efforts to raise revenues must be considered. These include an increase in the consumption tax to more than 10 percent and a reduction in the inheritance tax deduction. The aforementioned facets could fund the projected increase in social security-related spending and improve public debt sustainability. In addition, the government's medium- to long-term macroeconomic projections should be based on realistic assumptions of nominal GDP growth to ensure the feasibility and credibility of the fiscal consolidation plan.

Authorities' Views

26. **The new fiscal stimulus package was announced to support growth.** The authorities assessed that given the downside risks originating from overseas economies and the adverse economic impact of recent natural disasters, a fiscal stimulus package is needed to support growth, while preventing the economy from slipping into a recession. Moreover, economic growth on a solid footing is essential for the realization of fiscal consolidation targets. Based on such recognition, the authorities announced new economic measures to safeguard against disasters and to secure future growth, amounted to JPY13.2 trillion in December 2019. This package includes additional measures to stimulate private consumption, for example, by providing reward points for consumers utilizing Individual Number Card. Meanwhile, all additional tax revenues from the consumption tax hike will be allocated to fiscal consolidation and social security, such as reduction of contribution on long-term care insurance fees for people with low income, free early childhood education and so on.

27. **The authorities view the current medium- to long-term macroeconomic assumptions as realistic.** They stressed their medium- to long-term projection is intended to track the progress on economic revitalization and fiscal consolidation targets based on the "New Plan to Advance Economic and Fiscal Revitalization". The trajectory of GDP growth is determined endogenously from their model, while the total factor productivity growth rate is assumed to rise based on Japan's past performance. They opined that the macroeconomic assumptions are sufficiently realistic to keep their fiscal consolidation plan credible. For the time being, additional consumption tax hikes beyond 10 percent are not under consideration.

C.2 Maintaining Accommodative Monetary Policy

28. **The current easy monetary policy stance should be maintained to support growth and counter disinflationary pressures, and the BOJ should be ready to ease further in the event of a sharp economic downturn amid external headwinds.** Given long-term inflation expectations of around 1 percent and the weakening growth momentum, reaching the BOJ's price stability target of 2 percent is unlikely to be achievable in the near term. Slower wages and narrowing output gaps may lead to softening inflation momentum in the coming months. To anchor the private sector's inflation expectations and counter disinflationary pressures, the current accommodative monetary policy stance should be continued, or even eased further if the economy weakens more sharply. That said, from a longer-term perspective,

the authorities should be mindful of the possibility that the policy space under the QQE could become progressively limited over time as the BOJ's asset holding increases unprecedentedly.

29. **Measures to mitigate the adverse side effects of a prolonged monetary easing should be considered.** The adverse side-effects from prolonged monetary easing—including financial institutions' tight net interest margins, and the high concentration of the JGB and the ETF markets in the BOJ—require policymakers take mitigating measures to minimize market distortions. In this regard, when monetary policy needs to be eased further, measures to offset adverse impacts on financial intermediation and market functions should also be considered.

Authorities' Views

30. **The BOJ remains strongly committed to achieving the price stability target, while paying attention to the side effects of its policy on financial institutions' profitability.** After reviewing the recent economic and price situation, the BOJ assessed the momentum toward achieving the price stability target of 2 percent is likely to be maintained. That said, it will not hesitate to take additional easing measures if there is a greater possibility that momentum toward achieving the price stability target will be lost. With regards to financial institutions' struggles for profitability in a low interest rate environment, the BOJ stressed that the primary objective of the QQE with yield curve control (YCC) policy is solely to restore the price stability and not to shore up their profitability. Nevertheless, the BOJ continues to pay attention to the side effects of its policy on financial institutions' profitability. At present, it is assessed that the side effects are not significant enough to change its monetary policy stance.

C.3 Prudent Macroprudential Policy to Safeguard Financial Stability

31. **Financial supervision should continue to focus on ensuring that financial institutions have strong risk management practices in place, especially given their search for yield in a low interest rate environment.** Persistently low profitability in the banking industry, especially among regional banks, requires financial institutions to diversify revenue sources and innovate business models. In this regard, the Japan Financial Services Agency's (JFSA's) recent amendments to update its monitoring framework for regional banks and to reassess the early warning system are commendable. Meanwhile, the low long-term JGB yields may continue to drive financial institutions to invest overseas, especially the major banks, insurance companies and pension funds looking for higher returns. In particular, rapidly growing investments in overseas credit products such as leveraged loans and collateralized loan obligations (CLOs) should be closely monitored. In the current global low interest rate environment, life insurance companies' increased risk appetite in foreign bond investment warrants closer scrutiny from the financial regulator.

Authorities' Views

32. **The authorities pay close attention to developments in global financial markets and associated risk factors in Japanese financial institutions' overseas investment.** The JFSA has been cautious about financial institutions' overseas investments. It has assessed that the rising U.S. dollar funding cost has reduced the profitability of their investments in foreign

bonds, stocks and mutual funds. The JFSA is well aware that Japanese financial institutions have taken up a significant share of the global CLOs. The JFSA opined that their higher risk appetite is justifiable as long as the overseas investments contribute to improving their investment returns, and it is constantly engaged with major banks to discuss their risk management framework. With regard to regional banks struggling with low profitability, M&As will remain one option to consolidating and rebuilding sustainable business models. Although the authorities are involved in the screening and approval processes, final decisions should be made by the regional banks on their own.

C.4 Structural Reforms

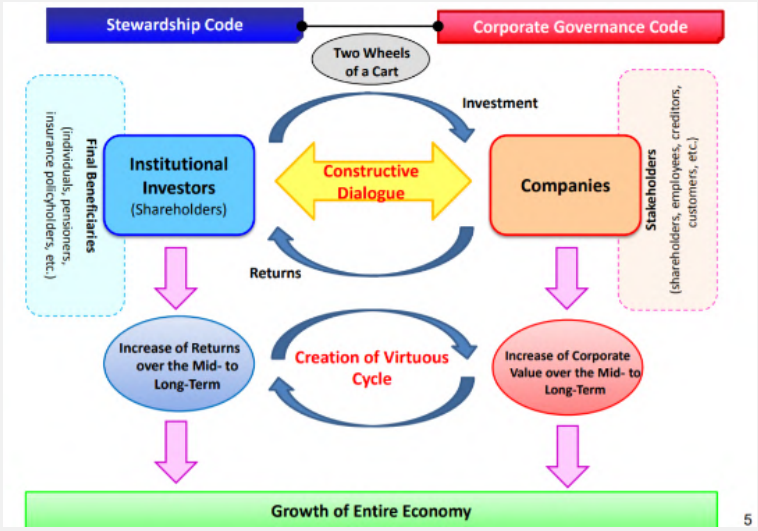
33. **Structural reforms should be pursued in a comprehensive manner to enhance the growth potential of the economy amid an aging population.** The authorities' proactive approach toward "Society 5.0" with a focus on advanced technologies is commendable. In particular, continued progress in digitalization across sectors, promotion of digital technology and encouraging entrepreneurship, are essential for Japan to gain a new competitive edge, while it continues to leverage on its current strength in manufacturing. Notably, under the new regulatory sandbox framework, 13 projects—including cryptocurrency, electronics, IT, medical services and real estate agent—have been approved since June 2018, which is assessed as a meaningful first step towards the facilitation of innovative technologies and new business models. Meanwhile, further corporate governance reforms are necessary to improve efficiency and transparency in management and enhance attractiveness of Japanese corporations to investors (See Box D. *Recent Developments in Corporate Governance Reform*). Furthermore, the revitalization of regional economies should be stepped up to correct excessive concentration of economic activity in major cities and their neighboring prefectures, and promote growth and employment all over Japan. In particular, the government should encourage venture capital companies and start-ups to invest in regional economies and adopt new business models that leverage on the resources available in local areas.

34. **Further efforts are needed to address the severe demographic challenges.** In order to cope with labor shortages, effective utilization and development of human resources through implementing work style reforms, employing robotics and automation, and embracing more foreign workers, should be encouraged. Labor force participation among the elderly and women could be further enhanced with strong policy support such as expanding employment opportunities for elderly workers and providing more childcare facilities. The promotion of diverse work styles with IT services including tele-work and promotion of work-life balance by reducing overtime hours, are important to encouraging and enabling more women to both work and raise families. The government should expedite the screening of skilled foreign workers, improve working conditions, and create a more favorable social environment for their settling-in.

Box D. Recent Developments in Corporate Governance Reform[17]

The Japanese government has pursued corporate governance reform since 2014 with the "Japan Revitalization Strategy" initiative to improve efficiency and transparency in corporate management. A couple of important measures have been implemented so far under this strategy. One is the "Stewardship Code" that was released in 2014 and provided principles for institutional investors. This code recommends constructive engagement and dialogue between institutional investors and investee companies in order to improve their corporate value and enhance medium- to long-term investment return for their clients and beneficiaries. The other was the "Corporate Governance Code", which was launched in 2015 and established fundamental principles for listed companies. This code recommends the implementation of transparent, fair and decisive rules for decision-making with due attention to various stakeholders so as to increase corporate value. These two codes work as two wheels of a cart in corporate governance reform. The revision of Corporate Governance Code in 2018 intended to improve the relatively low capital efficiency of Japanese companies compared to that of other advanced countries and to incentivize them to use their accumulated cash holdings. The "Stewardship Code" was further revised in 2017 and "Corporate Governance Code" revised in 2018 with a view to enhancing reform by addressing some specific issues.

Figure D1. Overview of Corporate Governance Reform



Source: JFSA

These codes have been widely adopted among corporations and institutional investors and, although their implementation is not mandatory, the corporations are requested to explain to their stakeholders when they don't comply with any particular aspect of the codes ("comply or explain"). Major institutional investors have accepted the "Stewardship Code. Corporate Governance Code is a part of Securities Listing Regulations by Tokyo Stock Exchange, which obligate listed companies to fulfill "comply or explain" the Code.

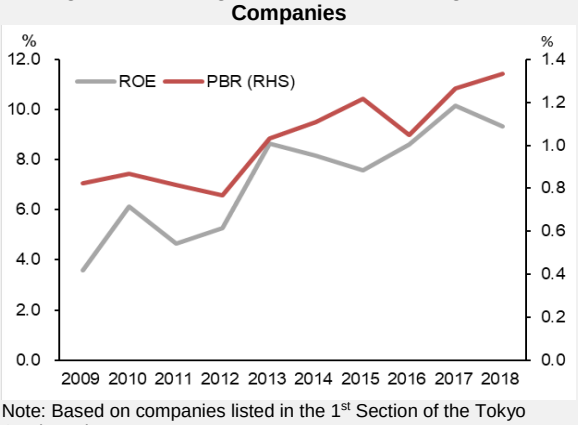
The capital efficiency of Japanese companies has been gradually improving but more efforts are needed. According to a report by the Ministry of Economy, Trade and Industry's (METI)[18], achieving a minimum return on equity (ROE) of 8 percent was suggested as a first step for receiving recognition from global investors. The average ROE of companies listed in 1st Section of Tokyo Stock Exchange has gradually risen from 3.6 percent in 2009 to 9.3 percent in 2019 (Figure D2). In addition, the average price-to-book value ratio (PBR) has climbed from 0.8 percent in 2009 to 1.3 percent in 2019. However, these levels remain well below average ROE and PBR of the U.S. corporations, and more decisive management decisions based on cost of capital are necessary for Japanese companies.

While the number of independent directors has increased significantly since 2014, there is room for improvement in terms of gender diversity among board members. The ratio of listed companies with two or more independent directors rose from 21.5 percent in 2014 to 93.4 percent in

[17] Prepared by Takashi Yonemura (Associate Researcher).
[18] METI (2014) "Ito Review of Competitiveness and Incentives for Sustainable Growth"

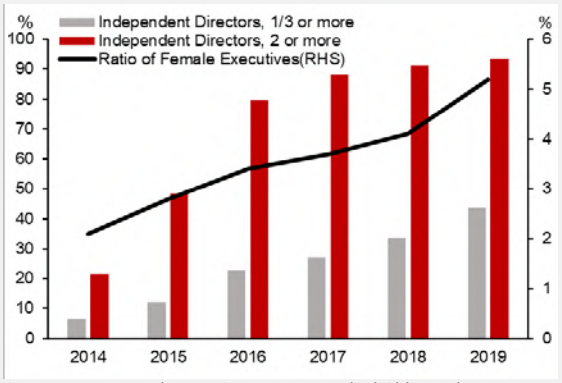
2019, while 43.6 percent of listed companies have independent directors exceeding one-third of all directors (Figure D3). Although the number of female directors also increased from 814 in 2014 to 2,124 in 2019, the ratio has remained very low at 5.2 percent in 2019, well below the government's target of 10 percent by 2020.

Figure D2. Average ROE and PBR among Listed Companies



Note: Based on companies listed in the 1st Section of the Tokyo Stock Exchange.
Source: Japan Exchange Group

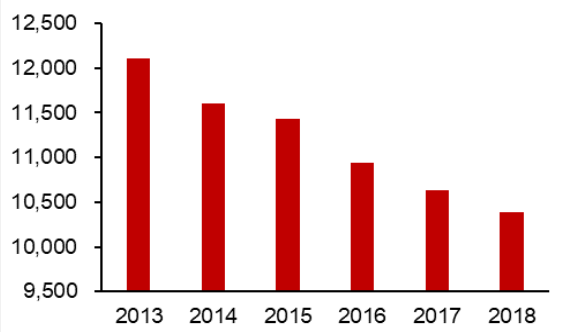
Figure D3. Proportions of Independent Directors and Female Directors



Source: Japan Exchange Group; Toyo Keizai Shinpo-sha

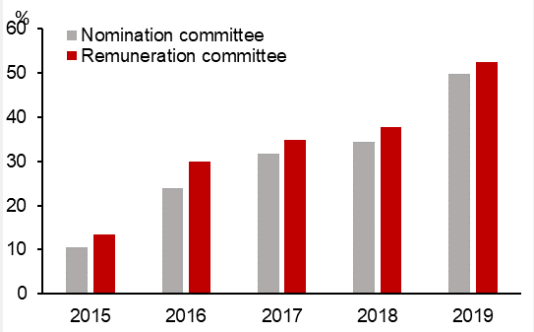
The "Corporate Governance Code" recommends disclosure of information on companies' cross-shareholding policies and cross-shareholding has been reduced in a slow and gradual manner. Cross-shareholding has been a prevalent practice among Japanese companies in the past, with companies investing in each other to strengthen their business ties. The practice has been criticized in many aspects, in particular, from the capital efficiency point of view. The "Corporate Governance Code" recommends companies to disclose their policies on cross-shareholding. Also, the code encourages companies not to hinder the sale of the cross-holding shares by implying a possible reduction in business transactions, which has led Japanese companies to reduce their sales of cross-holding shares (Figure D4). Cross-holding shares accounted for more than 30 percent of the total market capitalization in Japan in the 1990s and fell to about 10 percent in 2018, according to the Nomura Institute of Capital Markets Research. However, the pace of decline is relatively slow given that the ratio was about 35 percent in 1990 and has been below 15 percent since the early 2000s.

Figure D4. Total Number of Issues of Cross-holding Shares



Note: Excluding financial institutions.
Source: Japan Exchange Group

Figure D5. Proportion of Companies with Nomination Committee and Remuneration Committee



Source: Japan Exchange Group

There has been progress in terms of transparency in procedures for appointing and dismissing CEOs and in determining their remuneration. It is of utmost importance to create an effective and efficient system in selecting CEOs who would make appropriate decisions by balancing risks and potential corporate gains. It is equally important to provide relevant incentives that reward good performances. The nomination committee and the remuneration committee, where the majority of members are independent directors, are set to strengthen their independence, objectivity and

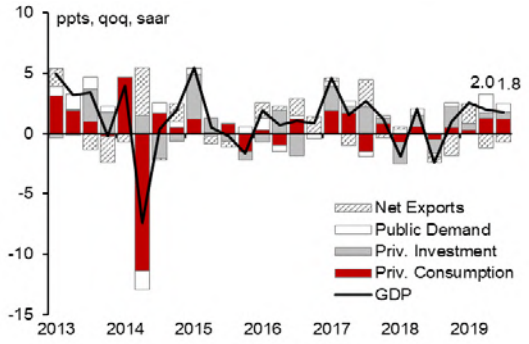
accountability in terms of their functions. The ratio of companies that have these committees reached about 50 percent in 2019 (Figure D5).

While progress has been made, further corporate governance reform is necessary to improve efficiency and transparency of management. In response to the corporate governance reform, companies are adopting new systems and changing conventional practices, but the current level of ROE is insufficient to attract investors compared to other countries. In order to strengthen their capital efficiency further, stricter monitoring by investors is important. Cross-shareholding, which weakens the monitoring function by shareholders, should be reduced drastically. Moreover, Japanese institutional investors should seek higher returns and improve their ability to have constructive dialogue with investee companies to enhance their corporate value and transparency.

Appendix 1. Selected Figures for Major Economic Indicators

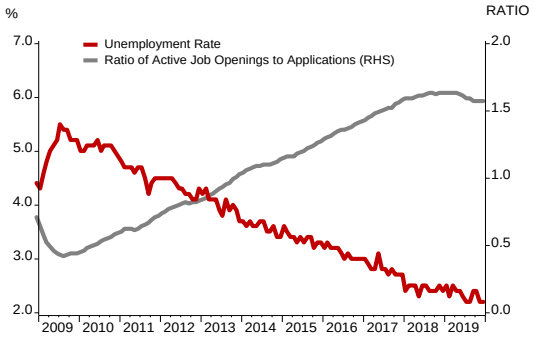
Figure 1.1. Real Sector

In 2019, real GDP growth remained resilient by sustained domestic demand.



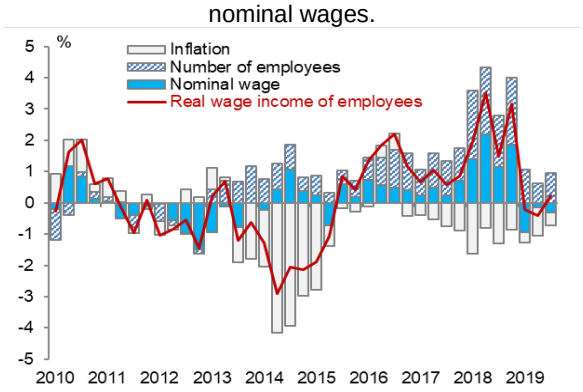
Source: Cabinet Office

The labor market remains tight with a steady increase in employment.



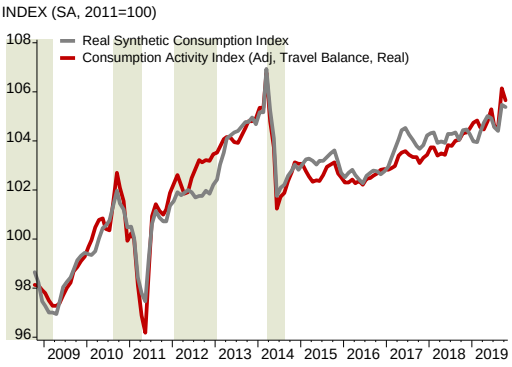
Source: MHLW; Ministry of Internal Affairs and Communications

Real employee income declined sharply in 2019, reflecting slower employment and a decline in nominal wages.



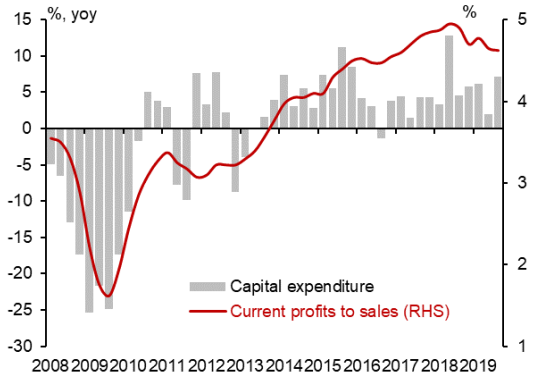
Source: MHLW; Ministry of Internal Affairs and Communications; AMRO staff calculations

Private consumption maintained its recovering trends.



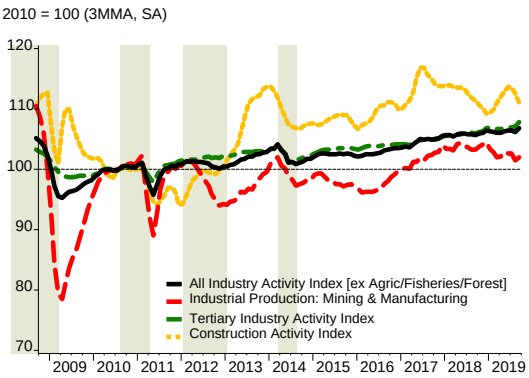
Source: Cabinet Office; BOJ; Haver Analytics

Business investment continued to be strong, while corporate profit began to decline.



Source: JMOF

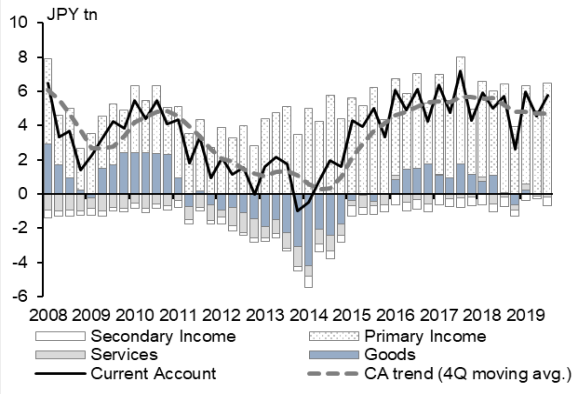
Industrial production has been diverging between manufacturing and non-manufacturing sectors.



Source: Ministry of Economy, Trade and Industry; Haver Analytics

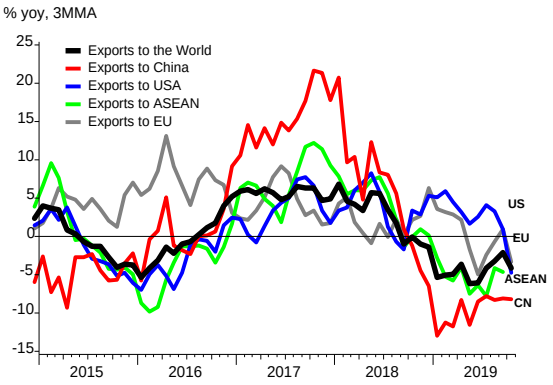
Figure 1.2. External Sector

The current account surplus remained sizable at 3.5 percent of GDP in the first three quarters of 2019.



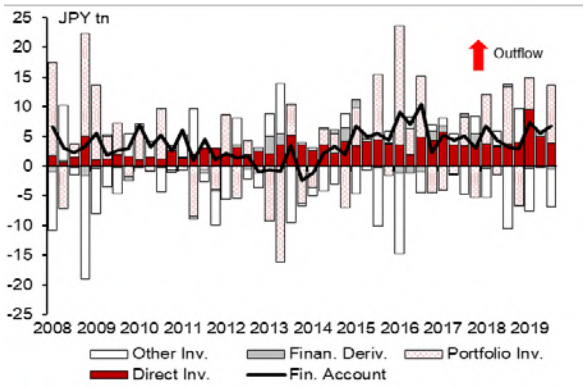
Source: JMOF

Merchandise exports (in volume) continued to deteriorate in 2019, especially destined to China and ASEAN.



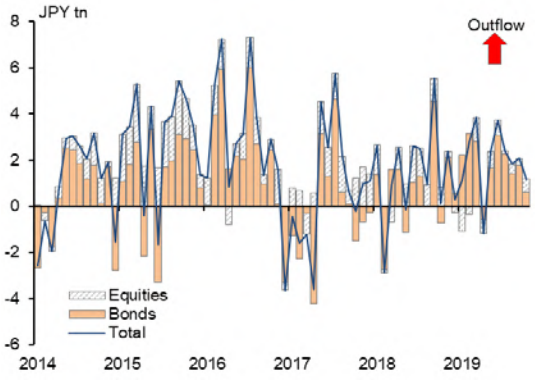
Source: JMOF

Capital outflows continue, driven by persistent outward direct investments.



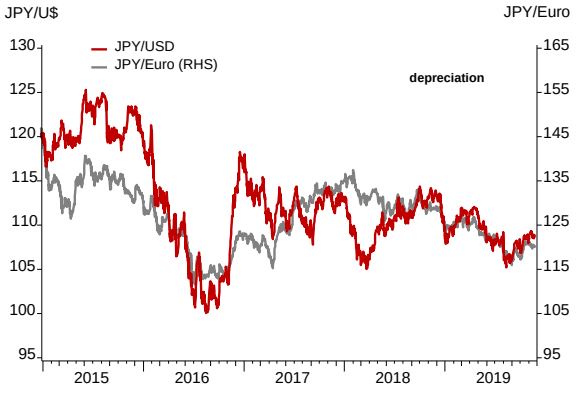
Source: JMOF

Japanese investors continued to purchase foreign stocks and bonds in the first three quarters of 2019.



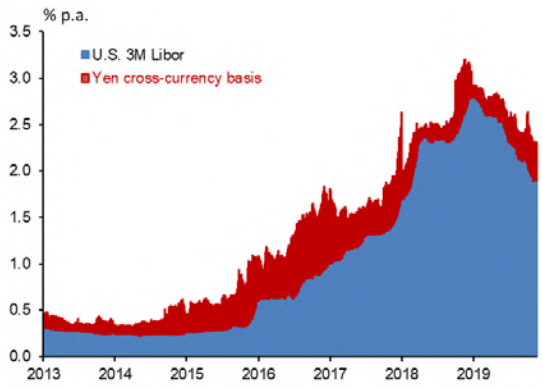
Source: JMOF

From April to August 2019, the JPY appreciated against the U.S. dollar and the euro, driven by compression in interest rate differentials amid the trade tensions.



Source: BOJ

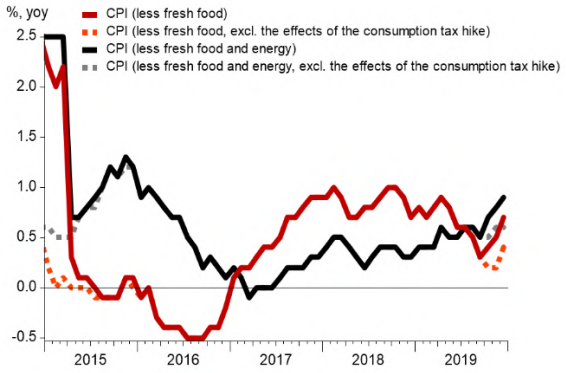
U.S. dollar funding costs declined in 2019, reflecting the Fed's rate cuts, but remained at a high level.



Source: Bloomberg

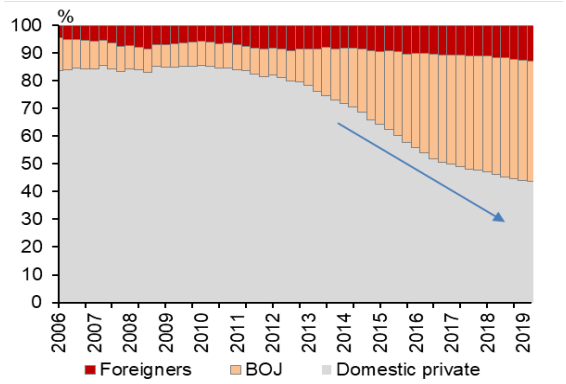
Figure 1.3. Monetary and Financial Sector

CPI inflation remains stubbornly low, far below the BOJ's 2 percent target.



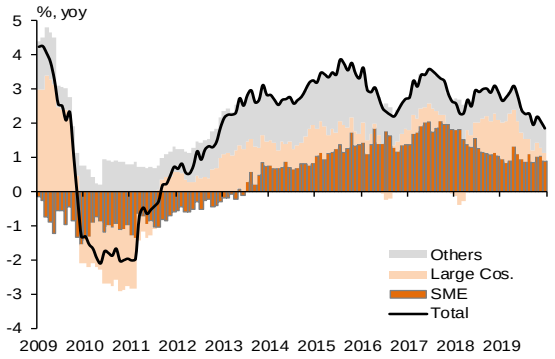
Source: Ministry of Internal Affairs and Communications; Haver Analytics

The BOJ's share of JGB holdings rose to over 43 percent in Q2, although there was some moderation.



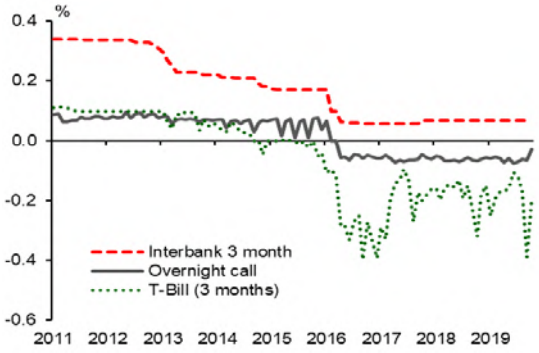
Source: BOJ; Haver Analytics

Loan growth slowed to below 2 percent in December 2019, reflecting a moderation in corporate loans.



Source: BOJ

Short-term inter-bank rates remain very low, mainly driven by the BOJ's monetary easing.



Source: BOJ; CEIC

10-year JGB yields fell below minus 0.2 percent in August temporarily amid the decline in global bond yields.

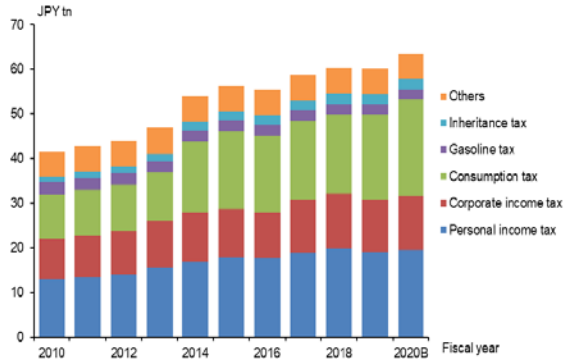
Source: Bloomberg

Stock prices have been largely resilient in 2019 amid JPY appreciation.

Source: Tokyo Stock Exchange; BOJ

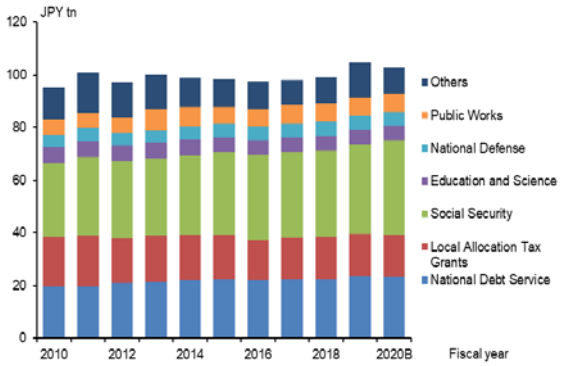
Figure 1.4. Fiscal Sector

In FY2019, tax revenues are expected to fall short of the budget despite the VAT hike.



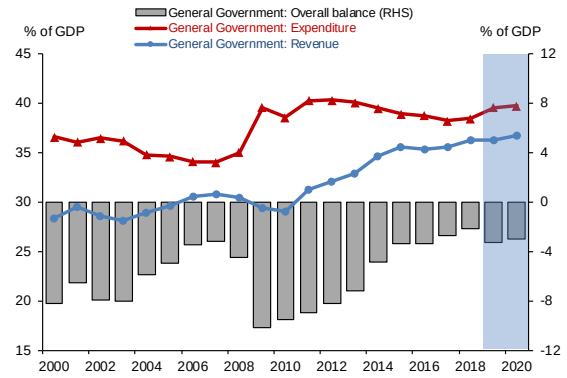
Note: Figures for FY2019 and FY2020 are based on the supplementary budget and the initial budget, respectively.
Source: JMOF

Government spending has been contained, but is expected to increase in FY2019 and FY2020.



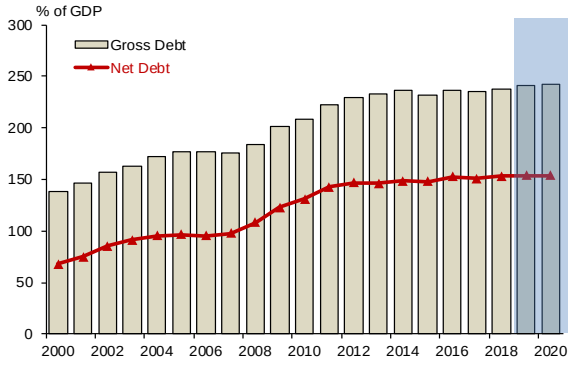
Note: Figures for FY2019 and FY2020 are based on the supplementary budget and the initial budget, respectively.
Source: JMOF

Although the fiscal balance has been on a gradual consolidation trend, the deficit is expected to widen in FY2019 and FY2020.



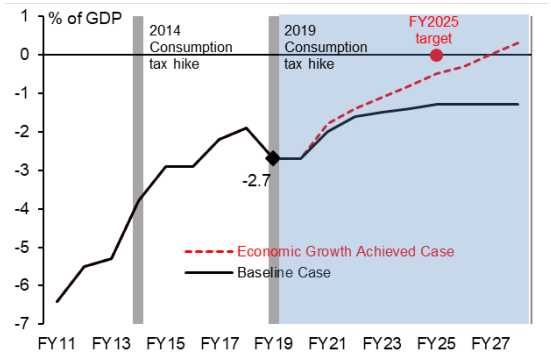
Source: Cabinet Office; AMRO staff estimates

Government debt has moderated recently, but remains high at over 230 percent of GDP.



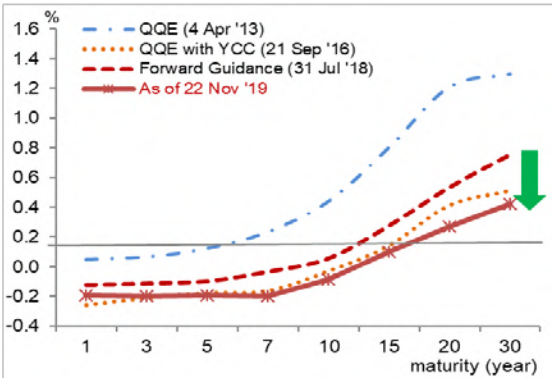
Source: Cabinet Office; AMRO staff estimates

The primary balance in terms of GDP is projected to remain in deficit until FY2027.



Note: The primary balance is for central and local government.
Source: Cabinet Office (January 2020)

The JGB yield curve has flattened significantly amid the fall of global bond yields in 2019.



Source: Bloomberg

Appendix 2. Selected Economic Indicators for Japan

	2015	2016	2017	2018	2019	2020
					Projection	
Real Sector and Prices	(Annualized percent change, unless otherwise specified)					
GDP growth (FY)	1.3	0.9	1.9	0.3	1.0	0.6
Private consumption	0.7	0.0	1.1	0.1	0.5	0.3
Private non-residential investment	1.6	-0.4	4.3	1.7	2.6	1.0
Private residential investment	3.7	6.3	-1.4	-4.9	2.6	1.1
Government consumption	1.9	0.7	0.3	0.9	2.5	1.1
Public investment	-1.6	0.6	0.5	0.6	4.2	4.7
Net exports (ppts)	0.1	0.8	0.4	-0.1	-0.3	0.0
Exports of goods and services	0.8	3.6	6.5	1.6	-1.2	0.6
Imports of goods and services	0.4	-0.9	3.9	2.2	0.6	0.5
GDP growth (CY)	1.2	0.5	2.2	0.3	1.1	0.5
Labor market (CY)	(Average of monthly data)					
Unemployment rate (%, sa)	3.4	3.1	2.8	2.4	2.4	2.5
Ratio of job offers per one applicant (sa)	1.20	1.36	1.50	1.61	1.61	1.60
Prices (FY) 1/	(Average of monthly data)					
CPI (all items)	0.2	-0.1	0.7	0.7	0.7	0.5
CPI (less fresh food)	0.0	-0.3	0.7	0.8	0.6	0.5
CPI (less fresh food and energy)	1.0	0.3	0.2	0.4	0.5	0.6
Prices (CY) 1/						
CPI (all items)	0.8	-0.1	0.5	1.0	0.5	0.5
CPI (less fresh food)	0.6	-0.3	0.5	0.9	0.7	0.5
CPI (less fresh food and energy)	1.4	0.6	0.1	0.4	0.5	0.6
External Sector 2/	(JPY trillion unless otherwise specified)					
Current account balance	16.5	21.4	22.6	19.2	19.3	19.6
Percent of GDP	3.1	4.0	4.1	3.5	3.5	3.5
Trade balance	-0.9	5.5	4.9	1.2	-0.2	-0.1
Exports, f.o.b.	75.3	69.1	77.3	81.2	75.0	76.5
Imports, f.o.b.	76.2	63.6	72.3	80.0	75.2	76.6
Service balance	-1.9	-1.1	-0.7	-0.8	-0.1	0.1
Primary income balance	21.3	19.1	20.5	20.9	21.1	21.4
Secondary income balance	-2.0	-2.1	-2.1	-2.0	-1.5	-1.8
Financial account balance	21.9	28.6	18.6	20.0	25.4	21.9
International reserves (USD bn, period end)	1,233.2	1,216.9	1,264.3	1,271.0	1,323.9	1,322.9
Fiscal Sector (FY, General Government) 3/	(In percent of GDP)					
Primary balance	-2.7	-2.6	-2.3	-1.9	-2.9	-2.5
Fiscal balance	-3.3	-3.4	-2.7	-2.2	-3.2	-3.0
Outstanding debt	231.6	236.3	235.0	237.1	241.0	242.0
Monetary Sector 4/	(In annual percent change, unless otherwise specified)					
Monetary base	34.0	25.0	17.0	7.3	3.5	3.4
Uncollateralized overnight call rate (%, end of period)	0.038	-0.058	-0.062	-0.055	-0.060	-0.050
Memorandum Items 4/						
Trade balance, customs cleared	-2.8	4.0	2.9	-1.2	-2.7	-2.6
Exports of goods, customs cleared	75.6	70.0	78.3	81.5	80.5	81.1
Imports of goods, customs cleared	78.4	66.0	75.4	82.7	83.2	83.7
Exchange rate (JPY/USD, period average)	121.0	108.8	112.2	110.4	…	…
Exchange rate (JPY/USD, end of period)	120.4	117.1	112.7	110.4	…	…
Nikkei 225 (JPY, end of period)	19,033.7	19,114.4	22,764.9	20,014.8	…	…
JGB 10 year yield (%, end of period)	0.267	0.043	0.047	0.013	-0.050	-0.050
Non-performing loan ratio (%, end of March, Major banks)	0.97	0.87	0.66	0.58	…	…
Nominal GDP (USD bn, FY)	4,402.4	4,932.7	4,882.2	4,967.0	5,152.7	5,217.1
Nominal GDP (JPY tn, FY)	532.8	536.9	547.6	548.4	556.5	563.4

Note: 1/ CPI inflation projections for 2019-2020 exclude the effects of consumption tax hike and policies concerning the provision of free education.
2/ The BOP data in external sector follow the IMF BPM6 standard.
3/ FY2019-20 figures are based on AMRO staff projections.
4/ Based on calendar year, unless otherwise mentioned.
Source: Japanese authorities; AMRO staff estimates and projections.

Appendix 3. Balance of Payments

	2015	2016	2017	2018	2019	2020
					Projection	
	(In trillions of yen unless specified)					
Current account balance (I)	16.5	21.4	22.6	19.2	19.3	19.6
Trade balance	-0.9	5.5	4.9	1.2	-0.2	-0.1
Exports, f.o.b.	75.3	69.1	77.3	81.2	75.0	76.5
Imports, f.o.b.	76.2	63.6	72.3	80.0	75.2	76.6
Services, net	-1.9	-1.1	-0.7	-0.8	-0.1	0.1
Receipts	19.7	19.1	21.0	21.4	21.9	22.2
Payments	21.6	20.3	21.7	22.2	22.0	22.1
Primary income, net	21.3	19.1	20.5	20.9	21.1	21.4
Secondary income, net	-2.0	-2.1	-2.1	-2.0	-1.5	-1.8
Capital account (II)	-0.3	-0.7	-0.3	-0.2	-0.3	-0.2
Financial account (III) (+ indicates net outflows) 1/	21.3	29.2	16.0	17.3	22.7	22.0
Direct investment (net)	16.1	14.9	17.2	14.7	22.6	16.0
Portfolio investment (net)	16.0	29.6	-5.7	10.0	10.3	10.5
Financial derivatives (net)	2.1	-1.7	3.5	0.1	-1.4	1.5
Other investment (net)	-13.1	-13.7	0.9	-7.5	-8.8	-6.0
Errors and omissions (IV)	5.6	8.0	-3.7	1.0	6.4	2.5
Overall balance (= I + II - III + IV)	0.6	-0.6	2.7	2.7	2.7	-0.1
Reserve assets (+ indicates increases)	0.6	-0.6	2.7	2.7	2.7	-0.1
Memorandum items:						
Current account balance (In percent of GDP)	3.1	4.0	4.1	3.5	3.5	3.5
Gross reserves (JPY trillion, end of period)	148.6	142.6	142.4	140.3	143.0	142.9
(In months of imports of goods and services)	17.8	19.8	17.6	16.0	20.6	20.5
Changes in gross reserves (JPY trillion)	-2.5	-6.0	-0.2	-2.1	2.7	-0.1
Nominal GDP (USD billion)	4,390.0	4,924.8	4,860.4	4,861.4	5,147.3	5,203.4

Note: 1/ Excludes changes in reserve assets.
2/ Based on calendar year, unless otherwise mentioned.
Source: Japanese authorities; AMRO staff calculations.

Appendix 4. Statement of Government Operations

	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
						Projection	
General Government 1/	(In percent of GDP)						
Revenue (I)	34.6	35.5	35.3	35.6	36.2	36.3	36.7
Taxes	18.5	18.8	18.5	18.9	19.4	19.3	19.5
Personal Income Tax	5.1	5.1	5.1	5.2	5.4	5.3	5.4
Corporate Income Tax	4.5	4.3	4.2	4.5	4.7	4.5	4.6
Consumption Tax	4.0	4.5	4.4	4.3	4.4	4.8	5.1
Others	5.0	4.9	4.9	4.8	4.9	4.7	4.4
Social Contributions	12.5	12.6	12.9	13.0	13.3	13.1	13.3
(o/w Social security contribution)	12.0	12.1	12.4	12.5	12.9	12.7	12.8
Other revenues	3.5	4.2	3.9	3.7	3.5	3.9	3.9
(o/w interest income)	1.4	1.4	1.2	1.4	1.5	1.2	0.9
Expenditure (II)	39.5	38.9	38.7	38.2	38.4	39.5	39.7
Expense (III)	38.8	38.4	38.2	37.7	37.7	38.7	38.9
Compensation of employees	5.5	5.4	5.3	5.3	5.3	5.4	5.5
Use of goods and services	3.4	3.3	3.4	3.2	3.2	3.5	3.5
Consumption of fixed capital	3.3	3.3	3.2	3.2	3.3	3.4	3.5
Social benefits	21.4	21.3	21.4	21.2	21.4	21.7	21.8
(o/w Social security benefits)	18.9	18.9	18.9	18.8	19.0	19.2	19.3
Interest	2.1	2.1	2.0	1.8	1.8	1.5	1.4
Subsidies	0.6	0.6	0.6	0.5	0.6	0.7	0.7
Grants	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other expense	2.3	2.3	2.3	2.3	2.2	2.4	2.4
Net Acquisition of Nonfinancial Assets (IV)	0.7	0.5	0.5	0.6	0.7	0.8	0.8
Net Operating Balance (= I - III)	-4.2	-2.8	-2.9	-2.1	-1.5	-2.4	-2.2
Net Lending/borrowing (Overall Balance) (= I - II)	-4.9	-3.3	-3.4	-2.7	-2.2	-3.2	-3.0
Primary Balance	-4.2	-2.7	-2.6	-2.3	-1.9	-2.9	-2.5
Gross Debt 2/	236.1	231.6	236.3	235.0	237.1	241.0	242.0
Central and Local Government 3/	(In percent of GDP)						
Primary Balance	-3.8	-2.9	-2.9	-2.2	-1.9	-2.7	-2.7
Central Government	-4.1	-3.4	-3.3	-2.5	-2.3	-3.3	-2.7
Local Government	0.3	0.6	0.4	0.3	0.4	0.4	0.3
Fiscal Balance	-5.4	-4.4	-4.4	-3.5	-3.2	-4.1	-3.8
Central Government	-5.2	-4.5	-4.4	-3.6	-3.3	-4.3	-3.8
Local Government	-0.2	0.2	0.1	0.0	0.1	0.1	0.0
Outstanding Debt	184.6	185.6	188.5	188.8	192.1	192.2	193.6

Note: 1/Based on the Government Finance Standard Manual (GFSM) 2014 standard; FY2019-20 figures are based on AMRO staff projections.
2/ Calendar year basis
3/ Excludes the expenditures and the fiscal resources for the recovery and reconstruction measures. FY2019-20 figures are based on AMRO staff projections.
Source: Japanese authorities, AMRO staff estimates and projections

Appendix 5. Data Adequacy for Surveillance Purposes: a Preliminary Assessment

Criteria/Key Indicators for Surveillance	Data Availability[(i)]	Reporting Frequency/Timeliness[(ii)]	Data Quality[(iii)]	Consistency[(iv)]	Others, if Any[(v)]
National Account	Yearly and quarterly data are available (for expenditure, production and income approach).	Quarterly data are released within two months of the end of the reference quarter (for 1st preliminary estimate)	-	-	-
Balance of Payments (BOP) and External Position	Monthly BOP data are available in detail.	Monthly BOP data are released on the sixth business day of the second month after the reference period, while quarterly IIP data are released on the sixth business day of the third month after the end of the reference period.	-	-	-
Central Government Budget/External Debt	Monthly central government public finance data are available, while quarterly external debt data available in detail.	Monthly central government public finance data are released within two months of the end of the reference period, while quarterly data on external debt are released within two months of the end of the reference period.	-	-	-
Inflation, Money Supply and Credit Growth	Monthly inflation, money supply and credit growth are available.	Monthly inflation data are released within one month of the reference period, while data on money supply and credit growth are released within two months of the end of the reference period.	-	-	-
Financial Sector Soundness Indicators	Available	Monthly data are released within one to two months after the end of the reference period, while quarterly data are available three months after the end of the reference period.	-	-	-
Housing Market Indicators	Available	Monthly data are released within one month after the end of the reference period.	-	-	-

Notes:
(i) Data availability refers to whether the official data are available for public access by any means.
(ii) Reporting frequency refers to the periodicity that the available data are published for. Timeliness refers to how up-to-date the published data are relative to the publication date.
(iii) Data quality refers to the accuracy and reliability of the available data given the data methodologies are taken into account.
(iv) Consistency refers to both internal consistency within the data series itself and its horizontal consistency with other data series of either same or different categories.
(v) Other criteria might also apply, if relevant. Examples include but are not limited to potential areas of improvement for data adequacy.

Source: AMRO staff compilation. This preliminary assessment will form the “Supplementary Data Adequacy Assessment" in the EPRD Matrix.

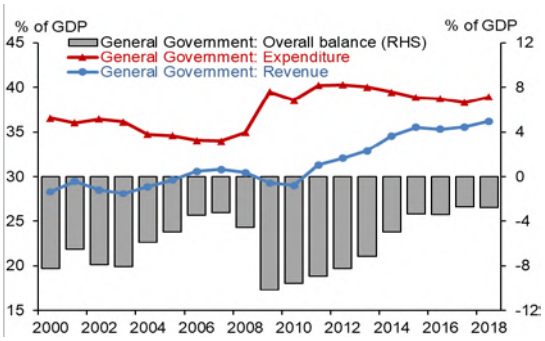
Annexes: Selected Issues

Annex 1. Will Japan's Government Debt Reach Its Limit?[19]

Background

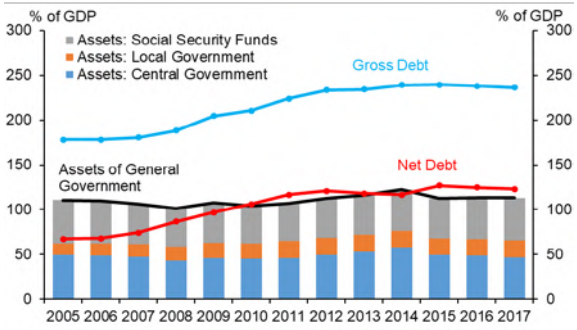
1. **Government debt in Japan remains very high, while stabilizing at around 240 percent of GDP in recent years.** Since 2010, the fiscal balance has shown gradual improvements, mainly owing to favorable tax collection supported by strong growth and the consumption tax rate hike, continued expenditure reforms and lower debt service burden (Figure A1.1). During this period, Japan's gross government debt has been hovering at below 240 percent of GDP. On a net basis, government debt has also stabilized at around 120 percent of GDP when the government's financial assets such as pension reserves and foreign currency securities are taken into account (Figure A1.2).

Figure A1.1 General Government Fiscal Balance



Source: Cabinet Office; AMRO staff estimates

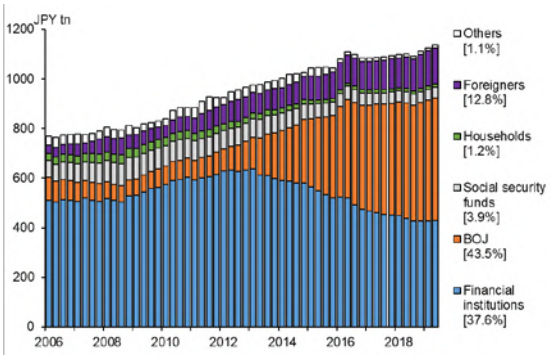
Figure A1.2 General Government Debt



Source: Cabinet Office; AMRO staff calculations

2. **The role of the private sector as a holder of government debt has declined significantly due to the BOJ's massive asset purchase program.** The share of JGB holdings by financial institutions significantly declined from 65.4 percent at the end of 2012 to 37.6 percent at the end of Q2 2019, largely offset by the surge in BOJ's share during the same period (Figure A1.3). Households' direct investment in JGBs stood out at only 1.2 percent of the total outstanding as of Q2 2019. Meanwhile, foreign investors have gradually increased their investments in JGB over the past decade, increasing their share to 12.8 percent at the end of Q2 2019.

Figure A1.3 JGB Outstanding by Holders



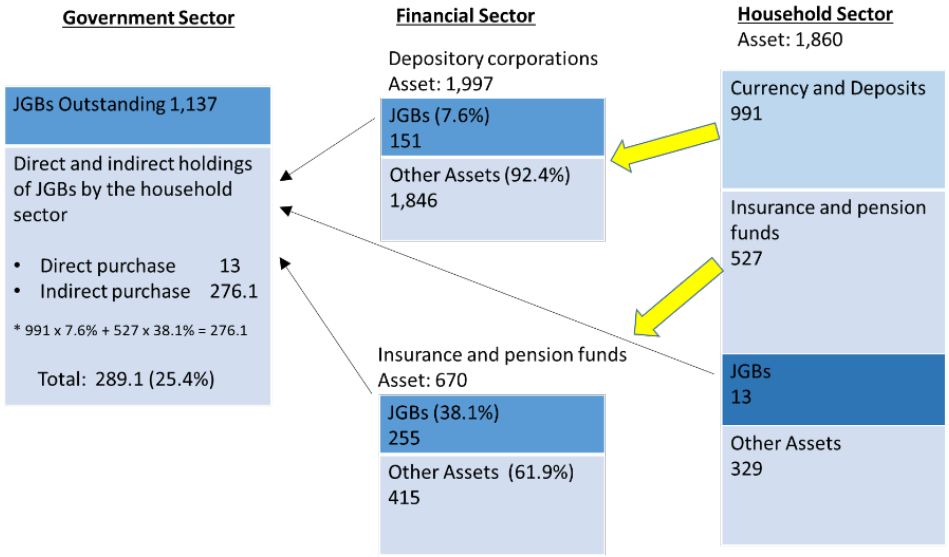
Note: The figures in brackets indicate each JGB investor's holding shares in the total as of Q2 2019.
Source: BOJ (Flow of Funds Data); AMRO staff calculations

3. **Japan's households as a whole own approximately 25 percent of total JGB outstanding, when indirect investment channels are considered.** Despite the low share in JGB holdings on their own, Japan's households have long played a pivotal role in financing the government budget through financial institutions. Figure A1.4, motivated by Tokuoka (2010),

[19] Prepared by Jinho Choi (Senior Specialist)

depicts the flow of funds from the household sector into the government finance. It indicates that, as of Q2 2019, households whose total financial assets amounted to JPY1,860 trillion, had savings of around JPY991 trillion at depository corporations, while they invested JPY527 trillion into insurance and pension funds. Households held 13 trillion worth of JGBs in their own accounts. In the financial sector, depository corporations invested 7.6 percent of their total assets in JGBs, while insurance and pension funds invested 38.1 percent of their assets in JGBs. As a result, the direct and indirect JGB holdings of the household sector amounted to JPY289.1 trillion, or 25.4 percent of total outstanding. This share is about half of the 51.5 percent share in Q3 2008, but still accounts for a significant portion of the government's total financing.

Figure A1.4 Flow of Funds of the Household Sector



Note: In JPY trillions, as of Q2 2019.
Source: BOJ (Flow of Funds Data); AMRO staff calculations

Hoshi and Ito (2014) Revisited: Assessing the Possible Limit to Government Debt in Japan

4. **This section attempts to investigate how long Japan's household sector can support the government sector as a key financing source.** It has been well known that Japanese households' home bias toward domestic assets contributed to the maintenance of low interest rates despite large issuance of government bonds in Japan. A study by Hoshi and Ito (2014) raised one crucial question on sustainability of such low interest rates amid growing government debt in Japan – that is, what will happen if the amount of government debt exceeds the amount of private saving stock? In this "crisis" situation, it is more likely that new JGBs can be sold to foreign investors at higher interest rates. They argue that in this crisis (or even ahead of it), market interest rates must rise as government debt accumulates. Against this background, this section aims to study how long Japan's domestic private saving can remain a key source of financing for JGBs by revisiting Hoshi and Ito (2014) (See Box A1. *Estimation Methodology on Government Debt Limit*).

5. **To this end, assumptions are made on key long-term macroeconomic and fiscal variables taking into account the government's medium- to long-term projections.** To make a projection for general government debt, we made some assumptions on key

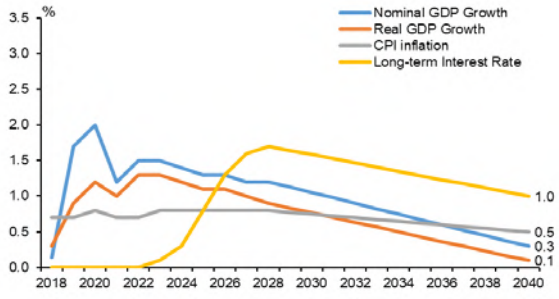
macroeconomic and fiscal variables through FY2040 with references to the authorities' projections. Table A1.1 summarizes long-term economic assumptions for key macro variables under the three scenarios considered. Our 'Low Growth' scenario is based mainly on the Cabinet Office's Baseline Case with some extensions through FY2040 when real GDP growth declines to 0.1 percent, CPI inflation stays at 0.5 percent and the long-term nominal interest rate is assumed to be 1 percent (Figure A1.5).[20] In contrast, a 'High Growth' scenario closely follows the Cabinet Office's Growth Achieved Case where both economic growth and CPI inflation reach 2 percent in five years, which is attributable to significant productivity boosts, but decline gradually to 0.4 and 1.2 percent, respectively in 2040 (Figure A1.6).

Table A1.1 Long-term Economic Assumptions (End-points at FY2040; in percent)

Scenario	Nominal GDP Growth	Real GDP Growth	CPI Inflation	Long-term Interest Rate
Low Growth	0.3	0.1	0.5	1.0
High Growth	1.8	0.4	1.2	1.7

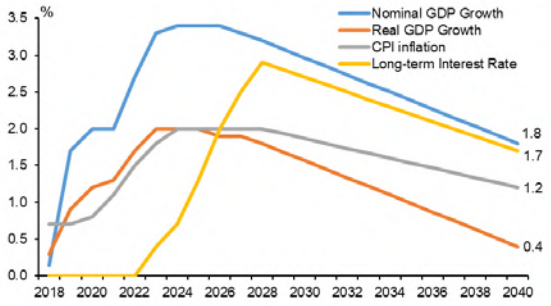
Note: The "Low Growth" and "High Growth" scenarios are adapted from Case F and E in the MHLW's "2014 Actuarial Valuation and Reform Options" (Table 2-3), respectively, combined with Baseline Case and Growth Achieved Case from the Cabinet Office's Economic and Fiscal Projections for Medium to Long Term Analysis.
Source: Cabinet Office; MHLW; AMRO

Figure A1.5 'Low Growth' Scenario



Note: Projections during the period FY2018-2028 are based on the Cabinet Office's Baseline Case (July 2019). Long-term projections for FY2040 are modified from the MHLW's "2014 Actuarial Valuation and Reform Options (Case F)".
Source: Cabinet Office; MHLW; AMRO

Figure A1.6 'High Growth' Scenario

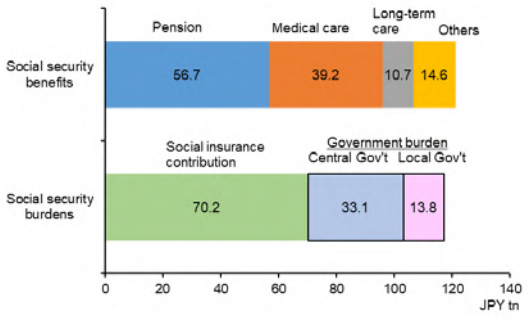


Note: Projections during the period FY2018-2028 are based on the Cabinet Office's Growth Achieved Case (July 2019). Long-term projections for FY2040 are modified from the MHLW's "2014 Actuarial Valuation and Reform Options (Case E)".
Source: Cabinet Office; MHLW; AMRO

6. **On the fiscal side, the difference between social security benefits and social insurance contribution is added to the government budget and is expected to grow rapidly on account of an aging population.** Structural mismatches in social security benefits and contribution will therefore weigh on the government's fiscal burden (Figure A1.7). According to the government's long-term projections for FY2040, the gap between social security benefits and social insurance contribution is expected to continue to widen, leading to a higher fiscal burden (Figure A1.8).

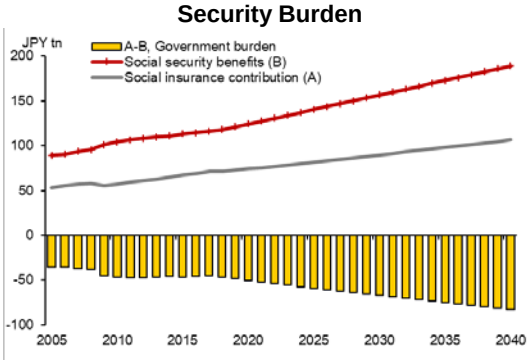
[20]This reflects the BOJ staff's estimation results on expected natural (real) rate of interest at 0.49 percent from the current period to 10 years ahead (Okazaki and Sudo, 2018).

Figure A1.7 Social Security Benefits and Burdens (As of FY2018)



Note: As of FY2018.
Source: National Institute of Population and Social Security Research (IPSS); MHLW

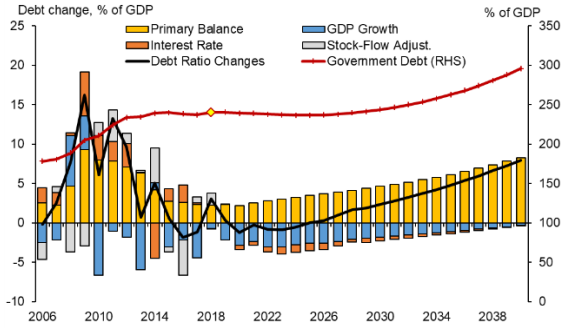
Figure A1.8 Long-term Projection for Social Security Burden



Note: Interpolations were made on the authorities' long-term projections for FY2040 under baseline scenario (May 2018).
Source: Cabinet secretariat; Cabinet Office; JMOF; MHLW; AMRO staff estimates

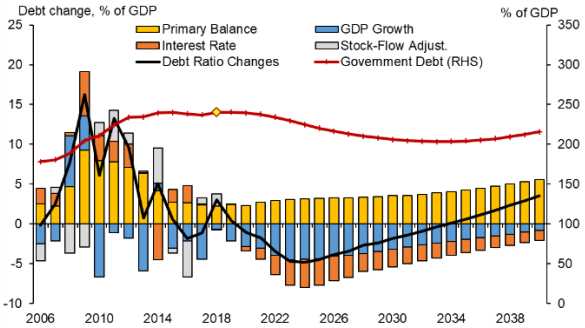
7. **In the 'Low Growth' scenario, the growing social security burden is expected to lead to an increase in the budget deficit, leading to a gradual increase in government debt.** In the "Low Growth" scenario, the government debt level is projected to increase to 296 percent of GDP by FY2040, mainly led by a widening in primary deficits (Figure A1.9). In contrast, in the "High Growth" scenario, the debt level is expected to stabilize at around 200 percent of GDP, reflecting higher GDP growth and lower real interest rates and the slowly widening fiscal deficit (Figure A1.10).

Figure A1.9 Government Debt Level Projection in the 'Low Growth' Scenario



Source: Cabinet Office; AMRO staff estimates

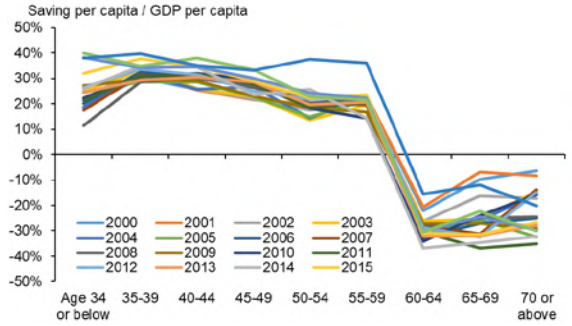
Figure A1.10 Government Debt Level Projection in the 'High Growth' Scenario



Source: Cabinet Office; AMRO staff estimates

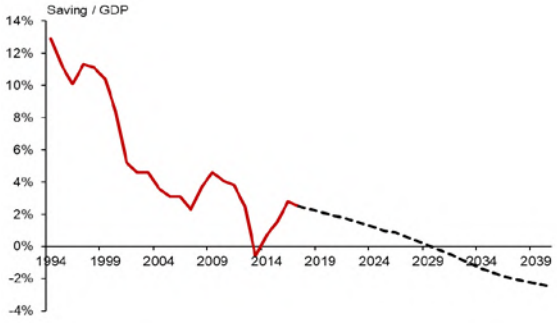
8. **The dynamics for government debt-to-GDP ratio is obtained from private financial asset stock and household saving data, following Hoshi and Ito (2014).** The upper bound for the debt-to-GDP ratio is defined as the level when the new issue of government bonds exceeds the total saving (flow) in that year, and the amount of the private sector financial assets that are not invested in the government bond yet. To this end, the aggregate households saving rate is estimated as the weighted average of an age-cohort group's savings rate while the outstanding balance of corporate savings will remain constant for the forecast horizon. Figure A1.11 indicates that time-varying generational saving rates in terms of GDP turned negative in groups of households whose heads are 60 years or older across years. A combination of estimated historical savings patterns across age-cohort groups and long-term population projections yields the long-term projection of aggregate savings rate through FY2040. Figure A1.12 shows our estimation results that aggregate household saving is expected to continue declining, turning into negative territory from FY2030 onwards due to a rapidly aging population.

Figure A1.11 Household Saving Rate by Age Bracket



Note: Based on the methodology by Hoshi and Ito (2014).
Source: Family Income and Expenditure Survey; IPSS; AMRO staff estimates

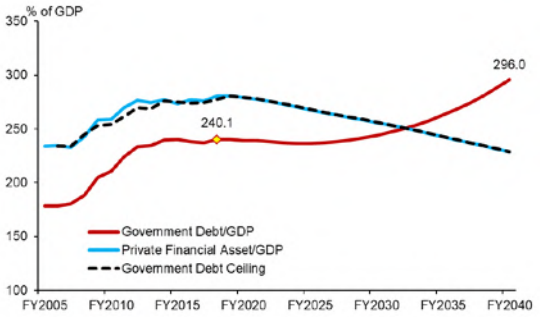
Figure A1.12 Household Saving Projection



Note: Based on the methodology by Hoshi and Ito (2014).
Source: Family Income and Expenditure Survey; IPSS; AMRO staff estimates

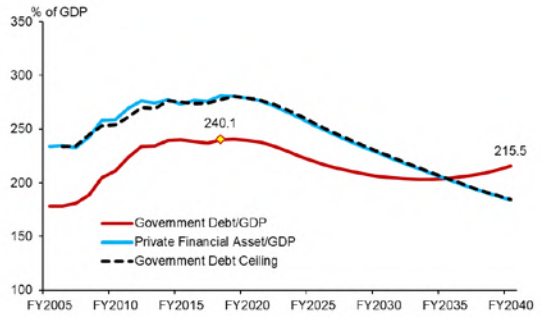
9. **Our simulations suggest that the government debt limit, as defined above, is expected to be reached in 15 years or so, regardless of macroeconomic scenarios.** Under 'Low Growth' scenario where the debt gradually rises to 296 percent of GDP, the upper bound for debt declines slowly, intersecting with the projected debt level in FY2032 (Figure A1.13). In contrast, in a 'High Growth' scenario, although debt stabilizes at around 210 percent, the debt limit is expected to drop faster along with the private financial asset-to-GDP ratio, and then crossing-over with debt in FY2035 (Figure A1.14).

Figure A1.13 Government Debt and Its Limit Under 'Low Growth' Scenario



Note: Based on the methodology by Hoshi and Ito (2014).
Source: Cabinet Office; AMRO staff estimates

Figure A1.14 Government Debt and Its Limit Under 'High Growth' Scenario



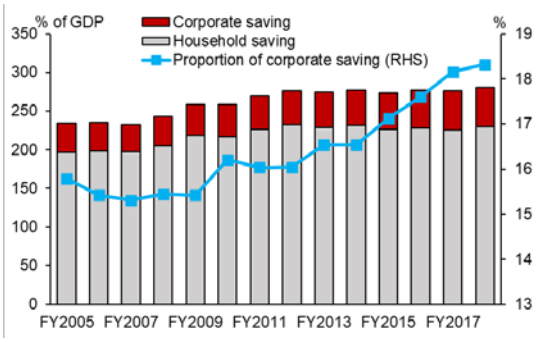
Note: Based on the methodology by Hoshi and Ito (2014).
Source: Cabinet Office; AMRO staff estimates

Policy Implications

10. **Our simulation results emphasize the strong need to pursue fiscal consolidation.** The results suggest that government debt in Japan will reach the financing limit backed by the household sector's financial assets only in a decade or so. Achieving higher economic growth may help delay the time taken to reach the limit to some extent. However, it is projected that Japan's growing social security spending amid rapid population aging will continue to weigh on the fiscal balance regardless of economic growth assumptions. In this regard, the government should prioritize long-term fiscal consolidation by maintaining modest growth in social security-related expenditure, especially reducing extensive healthcare benefits.

11. **As a caveat, the analysis in this section is based on simple scenarios focusing on household savings as the key funding source and the results can be different should other sources of funding— including the corporate sector and foreign investors—be taken into account.** Our simulation exercises rest on several simplified assumptions, including constant corporate saving rates, the exclusion of foreign investors from the government's financing sources. Although domestic private saving is mainly funded by households, the proportion of corporate saving is rising over time (Figure A1.15). While it is uncertain this upward trend will be maintained, incorporating corporate savings may raise the debt limit. Attracting more foreign investors into JGBs may also help broaden the government's financing sources, but at the cost of higher risk premiums required from those who have no 'home bias.' In addition, our analysis also implicitly has taken for granted that Japanese households' strong home bias for domestic financial assets will be continued. However, given their yield seeking behavior, if households can buy more foreign financial assets with higher returns, they will be less willing to invest in JGB bonds which means that it may shorten the time to reach the debt limit by eroding the government's domestic financing resources much faster.

Figure A1.15 Domestic Private Saving (Stock)



Note: As of the end of each fiscal year
Source: BOJ; AMRO staff calculations

Box A1. Estimation Methodology on Government Debt Limit

Step 1: Construct debt dynamics using the adjusted macro and fiscal assumptions

For data coverage, the national debt owed by the general government—central and local governments, and social security funds—is analyzed. As a basis for debt dynamics, long-term projection for the macro economy and public finance with reference to the following sources:

- Revenue: tax (adjusted to the Cabinet Office's medium- to long-term projections on the central and local governments through FY2028) and social security contributions (the authorities' long-term projection made in May 2018)
- Expenditure: social security-related expenditure (pension, medical and long-term care) using the authorities' projections. Other expenditures are in proportion to the growth rate of nominal GDP per worker.
- Key macroeconomic variables (nominal GDP, real GDP, long-term interest rate) rely on the Cabinet Office projections through FY2028, extended until FY2040 by the MHLW's long-term projections, "2014 Actuarial Valuation and Reform Options".

Step 2: Construct private financial assets using Hoshi and Ito (2014)

- Private financial asset data is constructed from the BOJ's Flow of Funds data
- Aggregate household saving rates are estimated as the weighted average of age-cohort group's saving ratios using the National Institute of Population and Social Security Research's (IPSS') long-term population projection.

Step 3: Estimate the upper bound for government debt-to-GDP ratio as debt limit

- The debt limit can be obtained under the condition that new issued debt cannot be purchased by newly created domestic saving as well as the remaining financial assets that have not been invested in government debt.
- Hoshi and Ito (2014) provided an interpretation of the debt limit as triggering a sharp rise in the interest rate – where an increment in the private sector's financial assets begins to be outpaced by an increase in government debt across different scenarios.

References

Hoshi, T. and T. Ito (2014), "Defying Gravity: Can Japanese Sovereign Debt Continue to Increase Without a Crisis?," *Economic Policy*, Vol. 29(77), 5-44.

Okazaki, Y. and N. Sudo (2018), "Natural Rate of Interest in Japan – Measuring its Size and Identifying Drivers Based on a DSGE Model," *Bank of Japan Working Paper Series*, No. 18-E-6.

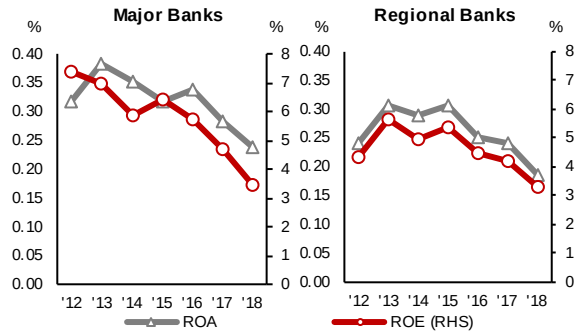
Tokuoka, K. (2010), "The Outlook for Financing Japan's Public Debt", *IMF Working Paper*, WP/10/19, International Monetary Fund.

Annex 2. Declining Profitability of Regional Banks and the Way Forward[21]

1. **Japanese commercial banks' profitability has declined over the last five years.** Shrinking loan demand in the domestic market continues to weigh down on business performance of commercial banks. In addition, the low interest rate environment has squeezed net interest margins (NIMs) of Japanese commercial banks, exerting downward pressure on profitability (Figure A2.1). The concern over weakening profits is more serious among regional banks compared to major banks, as some regional banks have already started to incur losses in recent years.

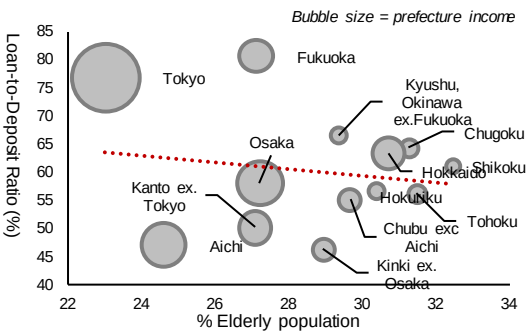
2. **It is perceived that the aging population and weakening economic activity in rural areas have been a critical challenge to Japanese regional banks; however, the direct relationship between these economic indicators and regional banks' profitability remains unclear.** Loan demand in rural areas has gradually declined and led to excess liquidity in regional banks (Figure A2.2), as many SMEs which are usually regional banks' customers, are closing down due to lack of a business successor. Moreover, SMEs in rural areas face difficulties in hiring young workers who are attracted to Tokyo and other major metropolitan areas. However, these structural issues have not impacted significantly on regional banks' profitability. For example, regional banks in Aichi prefecture have been experiencing lower profitability, even though prefecture income is higher and the share of elderly population is lower than other prefectures. Meanwhile, regional banks in the Shikoku region have relatively high profitability despite having a higher share of elderly population.

Figure A2.1 Profitability



Source: Japanese Bankers Association; AMRO staff calculations

Figure A2.2 Loan-to-Deposit Ratio vs Share of Senior Population



Note: Senior or elderly population comprises citizens aged 65 years and more.
Source: Japan Bankers Association Japan; the Japanese government's statistics portal (e-Stat); Moody's (2019); AMRO staff calculations

3. **This selected issue aims at studying the underlying causes of declining profitability of individual regional banks and their business strategy to strengthen returns.** The analysis comprised two parts. The first part analyses falling performance among regional banks by using the DuPont analysis,[22] which is a technique to decompose different

[21] Prepared by Wanwisa May Vorranikulkij (Specialist).
[22] This study Return on Equity instead of Risk-Adjusted Return on Capital (RAROC) to assess banks' profitability, although RAROC is a more comprehensive measurement of profitability of a bank. It assesses the income generation of capital that is allocated to different businesses, taking into account risks associated with each business area (European Central Bank, 2010).However, capital allocation and the degree of risks associated with each portfolio inside a banking group are usually not publicly available.

drivers of the banks' returns, including cost efficiency, return on asset and leverage (Box A2. *Data and Methodology on DuPont Analysis*). The second part assesses income generation across different business areas of regional banks, where individual banks' incomes are decomposed into three components: net interest income, fee and commission, and trading and investment income.

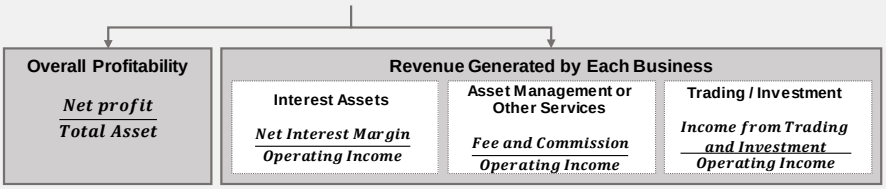
Box A2. Data and Methodology on DuPont Analysis

Financial indicators

DuPont Analysis is used to analyze underlying factors of banking performance. A bank's profitability is represented by Return on Equity (ROE), which is broken down into three components: cost efficiency ratio, operating return on asset and leverage ratio.

Income generation of each business area is assessed after that. Four financial indicators are calculated. *Return on asset (ROA),*[1] defined as pre-tax profits to total assets, reflects the general picture of a banks' profitability. Revenue generation by each business area is represented by *NIM to operating income*, *fee and commission income to operating income ratio*, and *trading and investment income to operating income ratio*. Splitting revenue from different sources will show which business areas contribute to profits and how banks change their revenue sources to maintain overall profits.

$$ROE = \frac{Net\ Profits}{Operating\ Income} \times \frac{Operating\ Income}{Total\ Asset} \times \frac{Total\ Asset}{Total\ Equity}$$



Data

This analysis covers annual financial data of 104 regional banks during FY2012-2018, which were published by the Japanese Banking Association in 2019.

Methodology

Each financial ratio is normalized to make comparisons among different indicators, following the methodology suggested by Ong, Jeasakul and Kwoh (2013).

$$z_{it} = \frac{x_{it} - \mu}{\sigma}$$

where z_{it} : a normalized score (z-score) of a financial ratio of bank i in FY t
x_{it} : a financial ratio of bank ''at FY 't'
μ : aggregate mean of a particular financial ratio over three consecutive fiscal years namely FY *t-2*, FY *t-1* and FY *t*
σ : aggregate standard deviation of a particular financial ratio over three consecutive fiscal years namely FY *t-2*, FY *t-1* and FY *t*

Three-year rolling mean and standard deviation incorporate time and cross-sectional dimensions of regional banks' business operations at a particular time.

4. **Regional banks that share common characteristics are grouped in order to see common patterns of business operations and to avoid identification of individual institutions.** The aggregation is done by two criteria. First, when assessed by *asset size,* total assets of individual regional banks in Japan are significantly diverse, from JPY0.3 trillion to

JPY16.8 trillion,[23] which may imply different business strategies by banks including income generation. Therefore, regional banks are grouped into quartiles depending on asset size. Second, *by region,* regional banks are also grouped by the place where their headquarters are located to gauge economic activity impact and the effects of an aging regional population on the regional banks' profitability.

Key Findings

5. **Revenue diversification and cost management by bigger regional banks have enabled those banks to maintain relatively stronger profitability (Table A2.1)**.

- The regional banks in the third and fourth quartile in terms of asset size (bigger regional banks) are more profitable than smaller regional banks despite having the weakest operating returns (operating income to total asset). The bigger regional banks are able to control operating costs, reflected by a higher efficiency ratio than their smaller peers. Income decomposition suggests that bigger regional banks have the weakest NIM but can maintain higher aggregate profitability by revenue diversification. Fee and investment income of the bigger regional banks tends to be stronger than the regional banks in other groups and shores up profitability in a low interest rate environment.
- In contrast, the regional banks in the first and second quartiles (small regional banks) are able to better maintain core profitability from lending. However, aggregate profitability of the smaller regional banks is relatively weak compared with their larger peers as the ability to generate income from other sources is limited. In addition, lower efficiency of business operation also weighs down on the smaller regional banks' net profits. Based on anecdotal evidence, smaller regional banks do not use enough automation due to high investment cost on the IT system. In addition, many regional banks also face difficulty to downsize its personnel and reduce labor costs.

6. **Despite the perception that aging population has dampened regional banks' profitability, we were unable to find a clear relationship between economic and demographic factors and overall profitability of regional banks at this stage[24].** The results indicate that the impact of demographic structure on regional banks' profitability showed variations among the prefectures. The regional banks in some prefectures with high prefecture income and a lower share of senior population had lower profitability than the regional banks in the prefectures with lower prefecture income and a greater share of senior population (Table A2.2). The income generation of each business areas are as follows:

- Prefecture income does not affect regional banks' income generation. For instant, NIMs and income generation ratio of regional banks in the prefectures with high prefecture income and low prefecture income tend to be higher than regional banks in other areas;
- Income from fees and commissions is relatively high in prefectures with a higher prefecture income and a smaller aging population share;

[23] As of March 2019, the end of Fiscal Year 2018.
[24] In this part, financial data of regional banks in the same prefecture are aggregated. Economic activity is represented by prefecture income while the aging situation is represented by the ratio of senior population (age 65 years old and above) to total population.

- Income from trading and investment does not have a relationship with economic activity and demographic structure. The result is as expected because security trading and investment can be done anywhere and are dependent on an individual bank's strategy; and
- Cost management is not related to economic factors as it usually depends on an individual banks' policy.

Conclusion and Policy Implication

7. **Consolidation could be one of the strategies for regional banks to strengthen profitability.** Our analysis shows different business strategies employed by big and small regional banks, with differing results. Bigger regional banks performed better in terms of revenue diversification and cost management while the income generated from interest bearing assets was smaller. In contrast, smaller regional banks were still able to get higher interest margins even though some of them are in smaller prefectures. The smaller regional banks are facing challenges in improving their cost efficiency. The difference in performance suggests that consolidation among regional banks may create business synergy that could strengthen revenue and reduce operating and investment costs of the integrated banks.

8. **Adjusting the business model may also help sustain the earnings of regional banks, especially when traditional banking businesses in the domestic market are not as profitable as before[25].** Our analytical findings and anecdotal evidence show that business diversification have shored up earnings. The regional banks that remain sound usually utilize their specialization in expanding into new areas such as consulting services. Some regional banks are expanding their operations overseas. These banks ally with overseas counterparts, usually local banks in host countries, to support the overseas expansion of Japanese SMEs in terms of finance and business consulting. Meanwhile, some banks have explored fintech opportunities and have enhanced collaborations with local governments and business associations by setting up venture funds and crowd-funding.

References

European Central Bank. (2010). Beyond ROE - How to Measure Bank Performance. *The Report on EU Banking Structur*e. Frankfurt am Main, Germany. Retrieved November 2019, from https://www.ecb.europa.eu/pub/pdf/other/beyondroehowtomeasurebankperformance201009en.pdf.

Ong, L., Jeasakul, P., and S. Kwoh (2013, August). *HEAT! A Bank Health Assessment Tool*. International Monetary Fund. Washington D.C., United States. Retrieved November 2019, from https://www.imf.org/en/Publications/WP/Issues/2016/12/31/HEAT-A-Bank-Health-Assessment-Tool-40872.

Suzuki, T., and S. Makimoto (2019, June). Demographic changes will hit small lenders hard but large banks and insurers will cope. Moody's Japan K.K. Tokyo, Japan.

[25] Regional banks also face difficulty to downsize its personnel and cut labor costs, in addition to challenging business environment. Some regional banks therefore started to conduct a secondment of their staff to work with local SMEs that are short of specialized labor, instead of job retrenchment.

Table A2.1. Income Decomposition and DuPont Analysis of Each Group of Regional Banks, Classified by Asset Size

Dupont Analysis

Quartile	ROE(%) : Net profits / Total Equity					Efficiency : Net profits / Operating income					Ability to generate income : Operating income / Total Asset					Leverage : Total Asset / Total Equity				
	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018
4	0.2	0.1	-0.3	-0.1	0.2	1.0	0.9	0.3	0.7	0.7	-0.2	-1.0	-0.9	-0.9	-0.9	-0.6	-0.5	-0.3	-0.4	-0.3
3	0.3	0.2	-0.2	-0.3	-0.7	0.5	0.3	-0.2	-0.2	-0.5	-0.2	-0.3	-0.2	-0.3	-0.3	-0.1	0.0	0.2	0.1	0.1
2	0.2	-0.1	-0.5	-0.1	-0.2	0.1	-0.3	-0.7	-0.2	-0.4	-0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.1	0.1
1	-0.2	-0.5	-0.8	-0.9	-0.5	-0.3	-0.7	-1.0	-1.0	-0.7	0.0	0.5	0.5	0.3	0.4	-0.1	0.0	0.1	0.1	0.2

Income Decomposition

Quartile	ROA (%) : Pretax profits / Total Assets					Interest Income: Net Interest Margin / Operating Income (%)					Fee Income: Fee and Commission / Operating Income (%)					Other Income: Trading and Investment Income / Operating Income (%)				
	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018
4	0.5	0.4	-0.1	0.1	0.3	-0.5	-0.7	-0.9	-0.6	-0.8	0.9	0.6	0.4	0.6	0.5	0.0	0.4	0.6	0.0	0.1
3	0.3	0.2	-0.2	-0.4	-0.7	-0.3	-0.4	-0.2	-0.1	-0.2	0.5	0.3	0.3	0.5	0.4	0.2	0.4	0.2	0.0	0.0
2	0.1	-0.2	-0.5	-0.1	-0.2	-0.2	-0.1	0.0	0.2	0.2	0.1	0.0	-0.1	0.1	0.2	0.1	0.1	0.2	-0.1	-0.2
1	-0.2	-0.4	-0.7	-0.7	-0.4	0.6	0.5	0.7	0.6	1.0	-0.6	-0.7	-0.7	-0.7	-0.6	-0.3	-0.1	-0.2	0.0	-0.5

Note: 1/ 104 regional banks are grouped into quartiles based on asset size. All individual banks were ranked by asset size, from the largest to the smallest. Bigger banks were grouped into the fourth quartile while smaller banks were grouped in the first quartile.

2/ The numbers shown in each cell indicate the average z-score of banks in the group. The higher the z-score is, the more sound the bank is compared to its peers, except in terms of leverage ratio. The color of the cell corresponds to the z-score. The indicators with the z-score of the 90th percentile or above are in dark green while the indicators with the z-score of the 10th percentile or below are in dark red. Indicators with the z-score falling in between these two thresholds are shaded in orange or yellow. Since leverage is not a focus of this study, we use shades of grey. The darker a color is, the higher leverage a bank has.

3/ The results of anonymous individual regional banks are in Tables A2.3 and A2.4.

Source: AMRO staff calculations, based on data from the Japanese Bankers Association.

Table A2.2. Income Decomposition and DuPont Analysis of Regional Banks in Each Region

Region	Prefecture income (thousand yen)	Share of Senior Population	ROE					Dupont Analysis: Efficiency : Net profits / Operating income					Dupont Analysis: Income generation : Operating income /Total Asset					Dupont Analysis: Leverage : Total Asset / Total Equity				
	FY2014	FY2017	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018
Kanto-Koshinetsu																						
Tokyo	60,415,546	23.0	1.8	0.9	0.1	0.2	-0.5	0.5	-0.1	-0.8	-0.6	-0.9	0.1	1.4	1.0	1.2	0.8	0.9	1.1	0.6	0.5	-0.5
Chiba, Kanagawa and Saitama	22,021,076	26.0	0.2	0.1	-0.3	0.0	0.1	0.7	0.7	0.1	0.5	0.2	-0.2	-0.5	-0.5	-0.7	-0.6	-0.5	-0.4	-0.2	-0.3	-0.2
Other prefectures	6,001,117	29.5	0.1	0.1	-0.3	-0.2	-0.2	0.6	0.6	-0.1	0.0	-0.1	-0.2	-0.3	-0.2	-0.2	-0.3	-0.7	-0.6	-0.3	-0.3	-0.1
Hokkaido	13,823,619	30.7	0.5	0.4	-0.2	-0.7	0.2	0.3	0.0	-0.4	-0.8	0.0	0.1	-0.6	-0.5	-0.8	-0.8	0.7	0.7	1.1	1.1	1.2
Tokai	12,377,520	28.0	-0.1	-0.4	-0.6	-0.8	-1.0	0.3	0.0	-0.5	-0.4	-0.6	-0.2	-0.3	-0.3	-0.1	-0.2	-0.7	-0.6	-0.5	-0.6	-0.6
Kinki	10,152,057	28.7	0.1	-0.1	-0.5	-0.3	0.0	0.4	0.1	-0.2	0.1	0.2	-0.2	-0.7	-0.8	-1.0	-0.8	0.0	0.1	0.3	0.1	0.1
Kyushu, Okinawa	4,548,605	29.1	0.0	-0.1	-0.7	-0.2	-0.2	0.1	-0.1	-0.8	-0.2	-0.2	0.0	0.4	0.5	0.2	0.2	-0.4	-0.4	-0.2	-0.3	-0.2
Chugoku	4,313,294	31.3	0.3	0.1	0.0	0.1	-0.1	0.3	0.1	-0.3	0.0	-0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	0.2	0.4	0.2	0.2
Tohoku	4,037,033	31.5	0.2	-0.2	-0.8	-1.2	-0.6	0.2	-0.5	-0.9	-1.2	-0.8	-0.2	-0.6	-0.3	-0.6	-0.5	0.5	0.5	0.8	0.7	0.7
Hokuriku	3,053,483	30.1	-0.3	-0.1	-0.4	-0.4	-0.3	-0.1	0.0	-0.2	-0.1	-0.1	-0.2	-0.3	-0.1	-0.4	-0.4	-0.4	-0.3	0.0	0.0	0.1
Shikoku	2,609,367	32.5	0.1	-0.2	-0.2	0.0	0.0	0.6	0.3	0.1	0.4	0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.7	-0.6	-0.5	-0.7	-0.7

Region	Prefecture income (thousand yen)	Share of Senior Population	ROA (%) : Net profits / Total Assets						Income Decomposition: Interest Income: Net Interest Margin / Operating Inome (%)					Income Decomposition: Fee Income: Fee and Commission / Operating Income (%)					Income Decomposition: Other Income: Trading and Investment Income / Operating Income (%)				
	FY2014	FY2017	FY2014	FY2015	FY2016	FY2017	FY2018	Avg	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018
Kanto-Koshinetsu																							
Tokyo	60,415,546	23.0	1.2	0.3	-0.2	0.1	-0.4	0.2	-1.7	-1.0	-0.6	-0.6	0.4	0.2	0.2	0.0	0.2	-0.1	1.6	0.8	0.6	0.5	-0.4
Chiba, Kanagawa and Saitama	22,021,076	26.0	0.4	0.3	-0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.3	-0.3	0.6	0.6	0.7	1.0	0.6	-0.1	-0.3	-0.5	-0.8	0.0
Other prefectures	6,001,117	29.5	0.4	0.4	-0.2	-0.1	-0.2	0.1	-0.2	-0.4	-0.5	-0.7	-0.4	0.2	0.0	-0.1	0.1	0.3	0.3	0.6	0.7	0.9	0.4
Hokkaido	13,823,619	30.7	0.1	-0.1	-0.6	-0.9	-0.2	-0.4	-0.3	-0.5	-0.3	-0.4	-0.4	2.3	2.0	2.1	2.0	1.9	-0.8	-0.3	-0.4	-0.4	-0.5
Tokai	12,377,520	28.0	0.2	0.0	-0.3	-0.5	-0.9	-0.3	-0.3	-0.3	-0.5	-0.1	-0.2	0.2	0.2	0.1	0.4	0.3	0.1	0.1	0.5	-0.2	-0.1
Kinki	10,152,057	28.7	0.0	-0.2	-0.6	-0.3	0.0	-0.2	-0.4	-0.5	-0.4	-0.3	-1.0	0.6	0.4	0.4	0.6	0.4	0.1	0.3	0.2	-0.1	0.8
Kyushu, Okinawa	4,548,605	29.1	0.2	0.1	-0.6	-0.2	-0.1	-0.1	0.4	0.2	0.6	0.6	0.8	0.0	-0.1	-0.2	-0.1	-0.2	-0.3	-0.1	-0.4	-0.4	-0.6
Chugoku	4,313,294	31.3	0.3	0.0	-0.2	0.0	-0.1	0.0	-0.1	-0.5	-0.6	-0.3	-0.2	-0.1	-0.3	-0.5	-0.4	-0.3	-0.1	0.3	0.5	0.1	-0.1
Tohoku	4,037,033	31.5	-0.1	-0.5	-1.0	-1.2	-0.6	-0.7	-0.1	-0.5	0.0	0.3	0.1	0.5	0.2	0.2	0.3	0.5	-0.1	0.5	0.0	-0.2	-0.2
Hokuriku	3,053,483	30.1	-0.2	0.0	-0.4	-0.3	-0.3	-0.2	-0.1	-0.4	-0.1	-0.3	-0.2	-0.1	-0.4	-0.4	-0.3	-0.1	0.6	1.0	0.6	0.7	0.2
Shikoku	2,609,367	32.5	0.5	0.1	0.1	0.3	0.2	0.2	0.4	0.5	0.2	0.4	0.2	-0.8	-0.7	-0.9	-0.7	-0.6	0.1	-0.2	0.2	-0.2	-0.2

Note: 1/ The numbers shown in each cell indicate the average z-score of banks in each prefecture. The higher the z-score is, the more sound the bank is compared to its peers. The color of the cell corresponds to the score. Indicators with the z-score of the 90th percentile or above were are in dark green while indicators with the z-score of the 10th percentile or below are denoted in dark red. Indicators with the z-score falling in between these two thresholds are shaded in orange or yellow. Since leverage is not a focus of this study, we use shades of grey. The darker a color is, the higher leverage a bank has.

2/ The results of anonymous individual regional banks are in the Table A2.5 and A2.6.

Source: AMRO staff calculations, based on data from the Japanese Bankers Association and the Japanese government's statistics portal (e-Stat)

Results of Anonymous Individual Banks and Individual Regions

Table A2.3. DuPont Analysis of Each Group of Regional Banks, Classified by Asset Size

Quartile	Bank	Dupont Analysis: ROE(%) : Net profits / Total Equity					Efficiency : Net profits / Operating income					Ability to generate income : Operating income / Total Asset					Leverage : Total Asset / Total Equity				
		FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018
4	Bank 1	1.1	1.3	0.9	1.0	0.7	2.0	2.0	1.7	1.8	1.5	-0.2	-0.1	0.3	-0.5	-0.5	-0.9	-0.8	-0.4	-0.6	-0.5
	Bank 2	0.9	1.1	1.0	0.9	1.6	1.6	2.0	1.6	1.5	2.1	-0.2	-1.4	-1.4	-1.7	-1.8	0.1	0.2	0.8	1.3	1.5
	Bank 3	0.6	0.7	0.5	0.7	0.8	1.7	2.0	1.6	1.7	1.5	-0.2	-0.8	-0.7	-0.8	-0.6	-0.9	-0.8	-0.6	-0.7	-0.6
	Bank 4	0.1	0.0	-0.9	0.2	0.4	1.8	1.6	-0.5	1.7	1.4	-0.2	-0.6	-0.1	0.7	-0.2	-1.7	-1.6	-1.7	-1.8	-1.8
	Bank 5	-0.1	-0.1	-0.4	0.0	0.5	0.9	1.0	0.3	0.7	1.0	-0.2	-1.0	-0.8	-0.8	-0.8	-1.0	-0.9	-0.7	-0.6	-0.5
	Bank 6	-0.2	-0.4	-0.8	-0.6	-0.2	1.0	0.9	-0.3	0.3	0.7	-0.2	-0.2	-0.1	0.8	-0.5	-1.7	-1.6	-1.7	-1.6	-1.2
	Bank 7	0.1	0.5	0.0	0.6	0.2	0.4	0.7	0.2	1.0	0.5	-0.1	-0.7	-0.3	-0.7	-0.6	-0.2	-0.1	0.0	-0.1	0.2
	Bank 8	0.0	-0.1	-0.5	-0.9	-0.1	0.1	-0.1	-0.5	-0.9	-0.1	0.3	-1.3	-1.1	-1.2	-1.3	0.6	0.7	1.0	0.9	1.2
	Bank 9	-0.6	-0.9	-1.3	-1.4	0.0	1.1	0.9	0.3	0.6	1.7	-0.5	-1.5	-1.6	-1.8	-1.7	-1.8	-1.6	-1.8	-2.3	-2.0
	Bank 10	0.7	0.9	1.1	0.8	0.8	1.0	1.5	1.2	1.2	1.4	0.0	-0.6	-0.6	-0.5	-0.8	-0.2	-0.2	0.3	0.1	0.0
	Bank 11	-0.1	-0.7	-0.9	-0.6	-0.1	1.0	0.0	0.0	0.2	0.5	-0.5	-1.9	-1.7	-1.9	-1.4	-0.3	-0.1	-0.1	-0.3	-0.4
	Bank 12	0.0	0.1	-0.5	-0.4	-0.3	1.2	1.6	0.1	0.4	0.1	-0.2	-1.1	-1.0	-0.5	-0.7	-1.1	-1.0	-0.7	-0.8	-0.9
	Bank 13	-0.1	0.1	0.0	0.5	0.4	1.1	1.6	0.9	1.3	0.9	-0.3	-1.2	-0.9	-0.5	-0.3	-1.1	-1.0	-0.9	-0.9	-0.9
	Bank 14	0.1	0.1	0.1	0.0	0.2	0.5	0.6	0.5	0.5	0.6	-0.3	-1.3	-1.3	-1.4	-1.4	0.1	0.2	0.6	0.7	0.5
	Bank 15	0.2	-0.3	-0.6	-0.3	-0.3	2.1	1.8	1.2	1.4	0.7	-0.1	-0.4	-0.6	-0.8	-0.5	-1.9	-1.8	-1.8	-1.9	-2.0
	Bank 16	0.9	1.7	1.2	1.3	2.0	1.2	2.1	1.4	1.3	2.0	-0.1	-0.7	-0.4	-0.6	-0.5	0.0	0.0	0.3	0.5	0.1
	Bank 17	1.0	-0.6	-1.2	-1.0	-0.3	1.4	-0.3	-1.4	-0.7	0.1	-0.3	-0.2	-0.8	0.0	-1.1	-0.4	-0.2	-0.1	-0.2	-0.1
	Bank 18	-0.7	-0.5	-1.3	-0.7	-0.2	0.1	0.5	-0.7	-0.2	0.2	-0.4	-1.5	-1.3	-1.3	-0.9	-0.9	-0.7	-0.6	-0.7	-0.3
	Bank 19	-0.1	-0.5	-0.6	-0.7	0.0	0.9	0.4	0.4	0.5	0.6	-0.2	-0.8	-0.7	-1.2	-1.2	-1.1	-1.1	-1.0	-1.1	-0.9
	Bank 20	0.1	-0.1	-0.7	-0.1	-0.1	0.9	0.7	-0.3	0.4	0.0	-0.3	-1.0	-1.0	-1.2	-0.9	-0.7	-0.4	-0.1	0.0	0.2
	Bank 21	0.5	0.2	-0.6	-0.4	-0.6	0.6	-0.1	-0.8	-0.7	-1.0	-0.5	-2.2	-1.8	-1.9	-1.7	-0.4	-2.4	-3.0	-3.1	-3.0
	Bank 22	0.4	0.6	-0.1	0.7	0.3	1.7	2.4	1.5	2.5	1.2	-0.3	-1.2	-0.8	-1.0	-0.6	-0.9	-0.8	-1.2	-1.4	-1.4
	Bank 23	0.0	-0.2	-1.0	-0.1	0.2	0.8	0.6	-0.8	0.6	0.6	-0.3	-0.8	-0.6	-0.8	-1.2	-0.9	-0.9	-0.3	-0.2	-0.1
	Bank 24	0.0	-0.7	-0.2	0.0	0.1	0.2	-0.4	-0.1	0.4	0.2	-0.3	-1.3	-1.7	-1.3	-1.1	0.4	0.5	1.1	0.4	0.4
	Bank 25	-0.4	0.1	-0.3	-0.7	-0.6	-0.2	0.1	-0.2	-0.5	-0.7	-0.3	-0.8	-0.5	-0.5	-0.8	-0.1	0.1	0.1	0.1	0.2
	Bank 26	-0.2	-0.6	-0.5	-0.3	0.1	0.7	0.6	0.3	0.4	0.6	-0.2	-0.7	-0.8	-0.8	-0.6	-1.3	-1.2	-0.9	-0.9	-1.0
	Average	0.2	0.1	-0.3	-0.1	0.2	1.0	0.9	0.3	0.7	0.7	-0.2	-1.0	-0.9	-0.9	-0.9	-0.6	-0.5	-0.3	-0.4	-0.3
3	Bank 27	0.5	0.1	0.1	0.0	-0.7	-0.3	-0.5	-0.5	-0.8	-1.2	-0.1	0.3	0.1	-0.2	0.4	1.5	0.8	1.3	1.3	1.6
	Bank 28	0.2	0.0	-1.0	-1.5	-1.1	-0.5	-0.9	-1.6	-1.8	-1.3	-0.2	-0.4	-0.6	-0.3	-1.7	2.2	2.6	1.8	1.7	-0.2
	Bank 29	1.1	0.8	0.1	-0.4	0.4	0.6	0.1	-0.4	-0.8	0.1	-0.2	0.1	0.2	-0.4	-0.4	0.8	0.8	1.2	1.2	1.2
	Bank 30	-0.2	-0.2	-0.5	-0.3	-0.1	0.2	0.2	0.3	0.5	0.4	-0.3	-0.6	-0.5	-1.4	-1.3	-0.6	-0.6	-0.3	-0.2	0.1
	Bank 31	0.6	0.3	-0.4	-0.1	0.0	1.5	1.4	0.4	0.8	0.5	-0.2	-0.5	-0.6	-0.8	-0.9	-0.9	-0.9	-0.7	-0.7	-0.7
	Bank 32	-0.4	-0.3	-0.3	-0.6	-0.7	0.2	0.1	-0.3	-0.4	-0.8	-0.2	-0.9	-0.6	0.2	-0.3	-0.7	-0.4	-0.2	-0.5	-0.4
	Bank 33	0.2	0.2	-0.7	-0.1	-0.3	0.7	0.8	-0.3	0.3	-0.4	-0.2	-0.8	-1.0	-1.2	-0.9	-0.2	-0.1	0.1	-0.1	0.2
	Bank 34	-0.2	-0.5	-0.7	-0.5	0.1	0.8	0.3	-0.1	0.3	0.9	-0.2	-0.6	-0.1	0.0	-0.4	-1.5	-1.3	-1.2	-1.3	-1.3
	Bank 35	1.4	0.8	0.7	0.5	-0.4	0.5	0.1	0.1	-0.1	-0.8	0.1	0.7	0.3	0.0	0.1	0.8	0.9	0.9	0.9	0.8
	Bank 36	0.2	1.0	-0.4	0.4	0.8	0.3	0.8	-0.6	0.3	0.8	-0.2	-0.8	-0.4	-0.8	-0.6	0.3	0.5	1.1	0.7	0.5
	Bank 37	-0.7	-1.0	-1.4	-1.3	-0.4	0.0	-0.2	-0.9	-0.7	0.0	-0.3	-1.2	-1.2	-1.3	-1.3	-1.1	-0.8	-0.6	-0.6	-0.6
	Bank 38	0.8	1.3	-0.1	0.8	-0.8	-0.2	0.1	-0.7	0.0	-1.2	0.0	0.7	0.8	0.0	0.3	1.7	1.2	1.2	0.9	1.0
	Bank 39	0.8	0.2	0.2	0.2	-0.6	0.2	-0.6	-0.5	-0.4	-1.1	-0.1	-0.3	-0.3	-0.5	-0.3	1.3	1.7	1.9	1.8	1.9
	Bank 40	-0.3	-0.6	-1.0	-0.9	-0.6	0.6	0.1	-0.3	-0.3	-0.4	-0.4	-1.7	-1.3	-1.6	-1.3	-0.4	-0.3	-0.2	-0.3	-0.4
	Bank 41	-0.5	-0.7	-1.1	-1.3	-0.7	0.6	0.3	-0.7	-1.1	-0.5	-0.3	-1.1	-0.5	-0.4	-0.5	-1.4	-1.3	-1.0	-0.9	-0.8
	Bank 42	3.0	3.7	4.2	-1.5	-12.2	2.2	2.5	2.9	-1.9	-8.5	0.5	3.7	4.0	4.5	6.8	-1.1	-1.1	-1.4	-1.5	-1.1
	Bank 43	0.3	-0.2	-0.7	-0.7	-0.6	0.8	0.3	-0.5	-0.6	-0.7	-0.2	-0.3	-0.4	-0.4	-0.2	-0.7	-0.5	-0.4	-0.4	-0.5
	Bank 44	0.4	0.2	-0.1	0.2	0.2	1.6	1.5	1.2	1.6	1.1	-0.1	0.1	0.3	0.1	0.0	-1.6	-1.6	-1.7	-1.7	-1.7
	Bank 45	0.1	0.3	1.2	0.5	0.2	1.0	0.9	0.8	0.8	0.5	-0.1	-0.5	-0.4	0.2	-0.6	-1.0	-0.4	0.3	0.0	-0.1
	Bank 46	-0.8	-1.3	-1.4	-1.4	-0.7	0.0	-0.5	-0.7	-0.9	-0.3	-0.3	-1.0	-1.0	-0.9	-0.7	-1.5	-1.4	-1.3	-1.4	-1.4
	Bank 47	0.6	1.3	0.7	1.2	1.3	0.6	1.1	0.6	0.8	1.2	-0.2	-0.3	-0.1	-0.4	0.0	0.1	0.3	0.6	0.3	0.3
	Bank 48	-0.1	-0.1	0.3	0.4	0.4	-0.1	-0.3	-0.1	0.1	0.2	-0.2	-0.9	-0.4	-0.2	-0.2	0.5	0.5	0.8	0.5	0.6
	Bank 49	0.2	-0.1	-0.5	-0.8	-0.4	0.1	-0.3	-0.8	-0.9	-0.6	-0.3	-0.9	-1.0	-1.1	-1.3	0.8	1.0	1.7	1.7	2.0
	Bank 50	-0.2	-0.8	-1.3	-1.3	-0.5	0.5	-0.7	-1.1	-1.1	-0.4	-0.3	-1.0	0.0	-0.9	-0.9	-0.6	-0.5	-0.4	-0.2	-0.4
	Bank 51	0.6	1.0	0.2	0.8	-0.6	-0.2	0.0	-0.4	0.1	-1.0	-0.1	0.7	0.8	-0.4	-0.3	0.9	0.9	1.3	1.3	2.0
	Bank 52	-0.1	-0.4	-1.0	-0.7	-0.3	0.4	0.1	-0.9	-0.4	-0.2	-0.3	-1.0	-0.9	-0.6	-0.9	-0.4	-0.3	-0.1	-0.2	-0.3
	Average	0.3	0.2	-0.2	-0.3	-0.7	0.5	0.3	-0.2	-0.2	-0.8 #	-0.2	-0.3	-0.2	-0.3	-0.3	-0.1	0.0	0.2	0.1	0.1
2	Bank 54	-0.4	-0.6	0.2	0.7	-0.2	-0.1	-0.3	0.5	1.0	0.0	-0.3	-1.2	-1.1	-0.9	-0.8	-0.1	0.2	0.2	0.2	0.6
	Bank 55	-0.7	0.4	-0.6	-0.5	-0.7	-0.9	0.3	-0.7	-0.6	-0.8	-0.2	-0.2	-0.4	-0.9	-0.9	0.3	0.3	0.8	0.8	1.0
	Bank 56	0.6	0.2	-0.5	-0.3	-0.1	0.8	0.4	-0.5	-0.1	0.0	-0.1	0.0	0.0	-0.1	-0.3	-0.3	-0.4	-0.2	-0.3	-0.6
	Bank 57	0.6	0.3	-0.3	0.3	0.4	0.4	-0.1	-0.6	0.0	0.1	-0.2	-0.5	-0.3	-0.5	-0.2	0.9	0.8	0.8	0.5	0.5
	Bank 58	0.2	-0.3	-0.8	-0.8	-0.5	0.9	0.3	-0.5	-0.4	-0.6	-0.2	-0.5	-0.6	-0.4	-0.7	-0.7	-0.6	-0.4	-0.5	-0.6
	Bank 59	-0.5	-1.0	-1.5	1.6	-0.7	-0.7	-1.5	-1.9	1.3	-0.9	-0.1	0.1	1.3	0.6	0.6	0.0	0.0	0.2	-0.2	0.1
	Bank 60	4.2	2.1	1.9	2.4	0.6	1.2	0.0	-0.1	0.5	-0.1	0.5	3.7	3.2	3.7	3.7	1.1	0.8	0.1	-0.2	-0.7
	Bank 61	-0.3	-0.1	-0.7	-0.8	-1.1	-0.6	-0.7	-1.2	-1.3	-1.5	0.0	0.5	0.6	0.1	0.2	0.3	0.4	1.0	1.0	0.9
	Bank 62	0.4	0.2	0.2	1.6	0.4	0.0	-0.4	-0.5	0.6	-0.1	-0.1	0.1	0.4	0.5	0.7	0.6	0.6	0.7	0.7	0.3
	Bank 63	0.6	-0.2	1.1	1.5	0.0	1.0	0.6	0.5	1.7	0.2	0.0	0.6	0.0	0.3	1.0	-1.1	-1.1	-1.0	-1.0	-0.5
	Bank 64	0.2	0.3	-1.8	0.4	0.0	0.5	0.7	-1.9	0.6	0.1	-0.2	-0.4	-0.4	-1.2	-1.2	-0.4	-0.4	0.1	0.6	1.4
	Bank 65	0.1	0.1	-0.5	0.0	0.4	0.7	0.7	-0.3	0.3	0.7	0.0	0.1	0.3	0.4	0.4	-1.1	-1.1	-0.9	-1.0	-1.1
	Bank 66	0.4	0.3	-0.3	-0.8	-1.2	-0.3	-0.9	-1.1	-1.3	-1.6	0.0	0.5	1.0	0.6	0.2	1.4	1.4	1.2	1.2	1.4
	Bank 67	1.1	0.7	-0.6	-0.3	-1.0	1.0	0.4	-0.8	-0.5	-1.3	0.0	0.9	0.6	0.1	0.5	-0.4	-0.1	0.0	0.0	-0.5
	Bank 68	-0.2	-0.7	-0.8	-0.7	-0.2	-0.1	-0.7	-0.7	-0.6	-0.2	0.0	0.0	0.0	-0.3	-0.2	-0.5	-0.3	-0.2	-0.3	-0.3
	Bank 69	-0.7	-1.0	-1.2	-1.0	-0.4	-0.4	-0.5	-0.8	-0.4	-0.1	-0.3	-1.0	-1.0	-1.0	-0.9	-0.7	-0.6	-0.6	-0.9	-0.9
	Bank 70	-0.7	-1.0	-0.9	-1.1	-0.4	-0.5	-0.9	-0.9	-1.0	-0.5	-0.2	-0.4	-0.3	-0.4	-0.4	-0.5	-0.4	-0.1	-0.1	-0.4
	Bank 71	0.1	-0.5	-0.1	-0.3	0.0	0.6	0.0	0.4	0.1	0.3	0.0	0.6	0.3	0.4	0.2	-1.3	-1.2	-1.2	-1.1	-1.1
	Bank 72	-0.3	-0.3	0.2	1.1	1.0	-0.4	-0.3	0.2	1.0	0.9	0.0	0.4	-0.2	-0.1	0.2	-0.4	-0.1	-0.1	-0.1	-0.4
	Bank 73	-0.4	-0.6	-0.9	-0.8	-0.3	-0.3	-0.6	-0.9	-0.7	-0.4	-0.2	-0.5	-0.3	-0.4	-0.6	0.1	-0.2	0.2	0.1	0.0
	Bank 74	1.5	1.4	1.4	0.8	0.6	0.3	0.0	0.0	0.1	0.1	0.2	1.3	0.5	0.9	0.6	0.9	1.3	1.8	0.4	0.5
	Bank 75	-0.7	-0.7	-0.5	-0.2	-0.2	-0.5	-0.2	-0.2	0.2	-0.2	-0.2	-0.7	-0.8	-0.5	-0.7	-0.5	-0.5	-0.3	-0.3	0.0
	Bank 76	-0.2	-0.7	-0.5	-1.3	-0.5	-0.2	-0.8	-0.6	-1.5	-0.6	-0.3	-0.8	-0.6	-0.5	0.1	0.3	0.3	0.5	0.4	0.3
	Bank 77	-0.6	-1.3	-1.4	-1.1	-0.9	-0.8	-1.7	-1.7	-1.3	-1.2	-0.1	0.2	0.1	-0.2	-0.2	0.0	0.3	0.5	0.5	0.3
	Bank 78	0.2	0.0	-1.2	-0.9	-1.0	-0.1	-0.5	-1.7	-1.4	-1.3	-0.2	-0.4	0.1	0.5	0.8	0.7	0.6	1.0	0.6	0.3
	Bank 79	0.5	0.8	-0.9	-1.0	-0.5	0.0	0.0	-1.5	-1.4	-1.0	-0.1	0.1	1.0	0.4	0.3	0.9	0.5	1.1	1.0	0.9
	Average	0.2	-0.1	-0.5	-0.1	-0.2	0.1	-0.3	-0.7	-0.2	-0.4 #	-0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.1	0.1
1	Bank 80	0.3	0.0	0.3	0.7	-0.3	1.2	0.6	0.2	0.7	-0.1	-0.1	0.4	0.9	1.9	1.6	-1.5	-1.4	-1.1	-1.3	-1.4
	Bank 81	-1.0	-1.4	-1.3	-0.7	-0.6	0.0	-0.2	0.1	1.4	0.6	-0.4	-1.5	-1.5	-1.8	-1.5	-1.9	-1.7	-1.7	-1.8	-1.7
	Bank 82	-0.1	-0.3	-0.5	-0.7	-0.4	-0.7	-1.2	-1.0	-1.1	-0.9	-0.2	-0.5	-0.4	-0.6	-0.5	2.1	2.7	2.4	1.9	1.5
	Bank 83	-0.6	-1.1	-1.2	-1.1	-0.4	-0.8	-1.4	-1.4	-1.3	-0.7	-0.2	-0.6	-0.7	-0.9	-1.1	0.8	0.8	1.2	1.5	1.8
	Bank 84	-0.1	-0.9	-0.4	-1.1	-1.0	-0.1	-1.2	-0.5	-1.2	-1.4	-0.3	-0.9	-0.6	-0.8	-0.6	0.7	0.7	0.8	0.7	0.8
	Bank 85	-0.7	-0.7	-0.5	-0.7	-0.9	-0.7	-0.6	-0.7	-1.1	-1.2	-0.1	-0.4	-0.4	-0.1	0.3	-0.1	-0.1	0.3	0.4	0.5
	Bank 86	0.2	-0.9	-1.1	-1.0	-0.9	0.4	-0.8	-0.9	-0.9	-1.0	0.0	0.6	0.2	0.1	0.2	-0.9	-0.9	-0.8	-0.8	-0.9
	Bank 87	0.2	-0.2	-1.1	-1.1	-0.6	0.2	-0.3	-1.3	-1.2	-0.8	-0.1	-0.1	-0.2	-0.3	-0.4	0.0	0.1	0.5	0.5	0.6
	Bank 88	-0.2	-0.2	-0.3	-1.0	-0.4	-0.5	-0.6	-0.9	-1.4	-0.7	-0.1	-0.5	-0.1	-0.1	0.2	0.8	0.7	1.2	1.1	1.0
	Bank 89	1.2	0.6	-0.1	-0.4	-0.5	0.7	-0.2	-0.8	-1.0	-1.0	0.4	2.1	2.6	2.3	1.7	-0.6	-0.4	-0.3	-0.2	-0.2
	Bank 90	0.2	0.1	-1.3	-0.8	-0.1	0.0	-0.1	-1.6	-1.0	-0.2	-0.2	-0.3	0.0	-0.2	-0.2	0.4	0.3	0.5	0.5	0.2
	Bank 91	-0.2	-0.3	-1.3	-0.8	-0.7	-0.4	-0.6	-1.6	-1.1	-1.1	-0.1	0.2	0.2	0.1	0.5	-0.1	0.1	0.4	0.3	0.7
	Bank 92	1.9	0.5	-0.8	-5.2	-1.2	0.7	-0.6	-1.4	-4.7	-1.6	-0.1	1.3	1.3	0.1	-0.2	0.8	1.1	1.4	1.9	2.8
	Bank 93	0.3	-0.9	-0.6	-0.8	0.7	0.3	-1.0	-0.7	-0.9	0.4	0.0	0.7	0.7	0.6	0.6	-0.7	-0.7	-0.7	-0.7	-0.8
	Bank 94	0.0	1.8	-0.6	-1.0	-0.7	0.1	1.6	-0.4	-1.0	-0.8	0.1	1.2	2.1	0.8	0.9	-1.1	-1.0	-1.1	-1.1	-1.0
	Bank 95	-0.6	-0.6	0.4	1.0	0.9	-0.6	-0.7	0.4	1.2	1.0	0.1	1.2	1.2	1.2	1.2	-1.1	-1.0	-1.0	-1.2	-1.2
	Bank 96	-0.8	-1.0	-1.5	-1.4	-0.5	-1.2	-1.6	-1.8	-1.6	-0.7	0.1	1.3	1.1	0.4	0.3	0.0	0.1	0.2	-0.1	-0.2
	Bank 97	0.4	-0.7	-0.7	-0.4	-1.8	-0.4	-1.5	-1.4	-1.1	-2.1	0.1	1.1	0.9	0.6	0.6	0.6	1.1	1.1	1.3	1.7
	Bank 98	-0.5	-0.4	-1.2	-0.7	-0.7	-0.7	-0.7	-1.5	-0.9	-1.1	0.1	1.2	1.0	0.7	0.7	-0.5	-0.5	-0.2	-0.3	0.0
	Bank 99	-0.8	-0.8	-0.8	-0.5	0.2	-0.4	-0.4	-0.3	0.2	0.8	0.0	-0.4	0.1	-0.4	-0.3	-1.3	-1.0	-1.0	-1.2	-1.1
	Bank 100	-1.2	-1.3	-1.1	-0.7	0.1	-1.4	-1.5	-1.4	-1.0	-0.3	0.0	0.5	0.3	0.2	0.5	0.0	-0.1	0.1	0.1	0.0
	Bank 101	-0.5	-0.3	-0.9	-1.4	-1.1	-0.9	-1.1	-1.6	-1.9	-1.5	0.1	0.6	1.2	1.0	1.2	0.4	0.5	0.6	0.5	0.6
	Bank 102	-0.6	-0.9	-0.1	-0.4	-0.8	-0.9	-1.4	-0.8	-1.2	-1.3	0.1	0.6	0.6	0.7	1.1	0.0	0.5	0.6	1.0	1.5
	Bank 103	-1.3	-1.3	-1.1	-0.6	-1.0	-1.8	-1.7	-1.5	-1.0	-1.4	0.1	1.3	1.0	0.9	1.0	1.6	-0.1	0.0	-0.1	0.0
	Bank 104	-0.1	-0.6	-1.4	-0.6	-0.9	-0.5	-1.3	-1.9	-1.1	-1.3	0.4	2.1	2.1	1.6	1.9	-0.5	-0.2	-0.3	-0.4	-0.3
	Average	-0.2	-0.5	-0.8	-0.9	-0.5	-0.3	-0.7	-1.0	-1.0	-0.7 #	0.0	0.5	0.5	0.3	0.4	-0.1	0.0	0.1	0.1	0.2

Note: 1/ 104 regional banks are grouped into quartiles based on asset size. All individual banks were ranked in terms of asset size, from the biggest to the smallest. Bigger banks were grouped into the fourth quartile while smaller banks were grouped in the first quartile.

2/ The numbers shown in each cell indicate an average z-score of banks in the group. The higher the z-score is, the more sound the bank is compared to its peers, except in terms of leverage ratio. The color of the cell corresponds to the z-score. The indicators with the z-score of the 90th percentile or above are in dark green while the indicators with the z-score of the 10th percentile or below are in dark red. Indicators with a z-score falling in between these two thresholds are shaded in orange or yellow. Since leverage is not a focus of this study, we use shades of grey. The darker a color is, the higher leverage a bank has.

Source: AMRO staff calculations, based on data from the Japanese Bankers Association

Table A2.4. Income Decomposition of Each Group of Regional Banks, Classified by Asset Size

Quartile	Bank	ROA (%) : Pretax profits / Total Assets					Income Decomposition — Interest Income: Net Interest Margin / Operating Income (%)					Fee Income: Fee and Commission / Operating Income (%)					Other Income: Trading and Investment Income / Operating Income (%)				
		FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018
4	Bank 1	1.7	2.0	1.0	1.2	0.8	-1.5	-2.2	-1.2	0.0	-0.7	2.2	1.5	1.5	1.8	1.6	0.7	1.8	0.6	-1.2	-0.8
	Bank 2	0.8	0.8	0.4	0.1	0.7	-0.5	-0.9	-0.7	-0.4	-0.6	1.7	1.3	1.3	1.6	1.0	-1.2	-0.7	-0.6	-1.5	-1.2
	Bank 3	1.1	1.3	0.8	1.0	0.9	-0.9	-1.1	-1.1	-1.1	-1.2	1.5	1.2	1.3	1.6	1.2	0.0	0.2	-0.1	-0.4	-0.6
	Bank 4	1.2	1.3	-0.1	1.4	1.2	-0.7	-1.0	-2.2	-0.7	-0.9	0.2	0.1	-0.4	0.3	0.0	0.8	1.0	2.5	0.0	-0.5
	Bank 5	0.4	0.4	-0.1	0.2	0.6	-0.2	-0.6	-1.0	-0.7	-1.1	0.9	0.5	0.2	0.7	0.3	0.0	0.4	1.0	0.1	0.9
	Bank 6	0.8	0.8	0.1	0.1	0.1	-2.1	-2.4	-3.4	-2.4	-1.4	-0.2	-0.5	-1.4	-0.7	-0.3	2.3	2.5	4.4	3.0	1.1
	Bank 7	0.2	0.5	-0.1	0.5	0.1	0.0	-0.2	-0.5	-0.5	0.5	1.2	0.8	0.8	0.8	1.1	-0.9	-0.2	0.0	0.2	-1.4
	Bank 8	-0.3	-0.5	-0.8	-1.1	-0.4	-0.4	-0.8	-0.7	-0.5	-0.6	2.8	2.3	2.3	2.2	2.3	-1.1	-0.2	-0.2	-0.6	-0.5
	Bank 9	0.2	-0.1	-0.6	-0.4	0.8	-0.3	-0.2	-0.5	0.4	-1.7	0.1	0.1	0.0	0.2	-0.7	0.4	0.1	0.6	-0.7	2.0
	Bank 10	0.7	1.0	0.7	0.5	0.6	-1.7	-1.8	-2.1	-1.6	-1.1	1.8	1.3	1.0	1.4	1.4	0.7	1.1	1.4	0.4	-0.1
	Bank 11	0.0	-0.7	-0.8	-0.5	0.0	-0.1	-0.1	0.4	0.2	0.0	0.5	0.2	0.5	0.2	0.3	0.1	0.2	-0.5	-0.1	0.0
	Bank 12	0.6	0.8	-0.2	0.0	-0.1	-0.5	-1.0	-1.9	-1.4	-1.6	0.9	0.6	0.2	0.3	0.3	0.1	0.6	1.5	0.3	-0.1
	Bank 13	0.5	0.8	0.4	0.9	0.6	1.1	0.6	-0.2	-0.5	-0.6	0.5	0.2	-0.2	0.2	0.1	-1.3	-0.6	0.4	0.3	0.4
	Bank 14	-0.1	-0.1	-0.3	-0.3	0.0	-0.2	-0.1	0.0	0.0	-0.4	1.3	1.1	0.6	0.7	0.9	-0.5	-0.6	-0.4	-0.6	-0.3
	Bank 15	1.6	1.1	0.5	0.9	0.4	0.9	0.6	0.0	0.2	-0.7	-1.2	-1.0	-0.8	-0.7	-0.7	-0.3	-0.3	0.0	-0.2	0.3
	Bank 16	0.8	1.6	0.8	0.8	1.5	0.1	-0.1	0.3	0.2	-0.2	2.3	1.8	1.5	1.6	1.1	-1.3	-0.7	-1.0	-1.2	-0.9
	Bank 17	1.2	-0.6	-1.1	-0.9	-0.2	-1.6	-0.6	-1.8	-0.7	-0.4	-0.3	0.0	-0.7	1.0	1.2	2.3	0.6	2.6	0.4	-0.4
	Bank 18	-0.4	-0.2	-1.0	-0.4	-0.2	-0.1	-0.4	-0.3	-0.9	0.0	0.7	0.6	0.6	0.2	0.8	-0.7	-0.3	-0.3	0.6	-0.9
	Bank 19	0.4	0.1	-0.2	-0.2	0.3	-0.5	-0.9	-0.4	-0.5	-1.8	0.2	0.0	0.2	0.3	-0.2	0.6	1.2	0.4	0.1	1.6
	Bank 20	0.4	0.1	-0.7	-0.1	-0.2	-0.8	-1.0	-0.9	-1.4	-1.6	1.3	1.3	1.3	1.1	1.5	0.5	0.5	0.1	0.7	0.5
	Bank 21	-0.4	-0.8	-1.3	-1.1	-0.9	-1.1	-1.9	-1.1	-1.0	-1.7	2.1	1.8	1.8	2.0	2.0	0.3	1.2	0.3	0.0	0.9
	Bank 22	0.8	1.2	0.6	1.5	0.8	-1.1	-1.7	-1.2	-1.0	-1.3	-0.1	-0.4	0.0	-0.1	-0.9	1.3	2.2	1.2	0.9	1.5
	Bank 23	0.4	0.3	-0.9	-0.1	0.2	-0.5	-1.0	-0.9	-0.2	-0.8	0.7	0.1	-0.2	0.1	-0.2	-0.4	0.8	1.0	-0.3	0.6
	Bank 24	-0.3	-0.9	-0.6	-0.3	-0.1	0.0	0.6	-0.1	-0.3	-1.5	-0.1	0.1	-0.5	-0.5	-0.3	0.2	-0.8	0.4	0.5	1.9
	Bank 25	-0.4	-0.1	-0.4	-0.7	-0.6	-0.2	-1.1	-1.2	-0.1	-0.3	1.2	0.6	0.4	0.4	-0.2	-0.9	0.6	0.7	-0.8	-0.1
	Bank 26	0.4	0.1	-0.1	0.1	0.4	0.2	0.3	0.3	0.0	-0.3	0.0	-0.1	-0.5	-0.4	-0.6	-1.0	-1.3	-1.1	-1.0	-0.5
	Average	0.5	0.4	-0.1	0.1	0.3	-0.5	-0.7	-0.9	-0.6	-0.8	0.9	0.6	0.4	0.6	0.5	0.0	0.4	0.6	0.0	0.1
3	Bank 27	-0.2	-0.3	-0.5	-0.5	-0.8	-2.0	-1.9	-1.7	-2.5	-1.7	0.6	0.4	0.2	0.2	1.1	1.5	1.5	1.3	2.5	1.0
	Bank 28	-0.6	-0.9	-1.3	-1.6	-1.0	-0.6	-0.3	-0.3	-0.5	0.7	1.9	1.3	1.2	1.5	0.7	-0.5	-0.5	-0.4	-0.3	-1.3
	Bank 29	0.5	0.2	-0.4	-0.8	0.0	-0.2	-0.2	0.0	-0.2	-0.1	1.8	1.6	1.9	1.8	1.5	-0.5	-0.3	-0.5	-0.3	-0.4
	Bank 30	-0.1	0.1	-0.3	-0.2	-0.2	-0.8	-0.7	0.0	0.1	-0.6	-0.1	-0.6	-0.2	-0.2	0.0	1.6	1.7	0.4	-0.1	0.1
	Bank 31	1.1	0.8	0.0	0.2	0.2	1.0	1.0	1.2	1.2	0.6	0.2	0.1	0.0	0.2	0.2	-0.8	-0.7	-0.8	-0.9	-0.3
	Bank 32	-0.1	-0.2	-0.2	-0.4	-0.6	-0.9	-0.9	-2.3	-1.3	-1.8	-0.3	-0.6	-0.9	-0.3	-0.2	1.3	1.2	2.8	1.1	1.2
	Bank 33	0.3	0.2	-0.7	-0.2	-0.3	-0.1	0.2	0.4	0.2	-1.0	0.7	1.1	1.5	1.7	1.1	-0.2	-0.8	-1.1	-1.1	0.6
	Bank 34	0.5	0.2	-0.1	0.1	0.5	-0.1	-0.6	-0.8	0.2	0.6	0.8	0.3	0.0	0.0	0.1	0.0	0.8	1.1	0.0	-0.4
	Bank 35	0.8	0.2	0.1	0.0	-0.5	0.0	0.3	0.3	0.4	0.4	0.6	0.2	0.2	0.6	0.1	-1.3	-1.2	-0.9	-1.0	-0.6
	Bank 36	0.0	0.5	-0.8	-0.1	0.5	0.6	-0.6	-0.1	0.1	-0.2	-0.1	-0.3	0.2	0.3	0.2	-0.8	0.8	0.0	-0.2	0.4
	Bank 37	-0.4	-0.7	-1.1	-1.0	-0.2	-0.1	-0.2	-0.3	-0.5	-1.3	0.5	0.6	0.8	1.2	1.1	0.0	-0.1	-0.2	-0.5	0.3
	Bank 38	0.0	0.4	-0.6	0.2	-0.8	-2.1	-2.3	-1.6	-1.3	-1.5	3.1	2.3	2.7	3.0	4.0	0.8	1.6	0.6	0.1	-0.5
	Bank 39	0.1	-0.6	-0.6	-0.5	-0.8	-1.1	-1.1	-0.7	-1.0	-0.4	2.2	1.8	1.8	2.2	1.9	0.0	0.3	0.0	0.0	-0.6
	Bank 40	-0.2	-0.5	-0.9	-0.8	-0.5	0.5	0.1	0.8	0.6	0.1	0.8	0.5	0.7	0.5	0.4	-0.9	-0.2	-1.1	-0.7	-0.1
	Bank 41	0.1	0.0	-0.7	-1.0	-0.5	0.6	-0.2	-0.9	-0.8	-0.6	0.3	-0.3	-0.3	0.0	0.0	-0.6	0.7	1.3	1.1	1.2
	Bank 42	4.4	5.3	6.1	-1.0	-12.6	2.1	2.5	2.3	2.3	2.0	-1.3	-1.5	-1.6	-1.9	-2.0	-1.2	-1.7	-1.4	-1.1	-0.6
	Bank 43	0.6	0.0	-0.6	-0.5	-0.5	-0.7	0.1	0.4	0.1	0.3	0.1	0.4	0.4	0.2	0.1	1.1	-0.1	-0.4	0.0	0.0
	Bank 44	1.6	1.5	1.1	1.4	0.9	1.1	0.7	0.4	0.3	-0.2	-0.5	-0.2	-0.2	-0.4	-0.3	-0.7	-0.6	-0.5	-0.5	-0.3
	Bank 45	0.6	0.5	0.7	0.3	0.1	-0.6	-0.9	-1.4	0.4	-0.3	-0.1	-0.2	-0.3	0.4	-0.3	1.1	1.5	2.1	-0.6	0.5
	Bank 46	-0.3	-0.7	-0.9	-1.0	-0.3	0.2	0.6	0.1	-0.1	-0.1	-0.2	-0.2	-0.4	0.0	0.1	0.2	-0.3	0.4	0.5	0.3
	Bank 47	0.5	1.0	0.3	0.7	0.9	0.0	-0.1	0.3	0.2	0.6	0.8	0.5	0.7	0.5	0.4	-0.4	-0.1	-0.6	-0.3	-0.7
	Bank 48	-0.4	-0.4	-0.2	0.0	0.1	-0.7	-1.2	-1.3	-0.8	-0.2	-0.1	0.0	-0.4	-0.3	-0.1	0.9	1.3	1.7	1.0	0.0
	Bank 49	-0.2	-0.6	-1.0	-1.1	-0.7	0.2	-0.1	0.0	0.8	0.7	0.4	0.4	0.3	0.5	0.8	-0.5	-0.2	0.1	-0.9	-1.1
	Bank 50	0.1	-0.6	-1.1	-1.2	-0.4	-0.4	-2.0	0.0	-0.3	-0.5	-0.1	-0.8	-0.3	-0.3	-0.1	0.5	2.7	0.0	0.6	0.8
	Bank 51	0.1	0.3	-0.4	0.0	-0.8	-3.1	-2.5	-0.5	-1.1	-1.1	-0.6	-0.5	0.2	0.3	0.5	4.4	3.2	0.5	1.2	1.0
	Bank 52	0.0	-0.3	-1.0	-0.7	-0.2	-0.3	-0.2	-0.5	0.2	-0.4	0.7	0.5	-0.2	0.6	0.3	0.0	-0.1	0.6	-0.8	0.0
	Average	0.3	0.2	-0.2	-0.4	-0.7	-0.3	-0.4	-0.2	-0.1	-0.2	0.5	0.3	0.3	0.5	0.4	0.2	0.4	0.2	0.0	0.0
2	Bank 54	-0.5	-0.7	0.0	0.5	-0.4	-1.2	-0.8	0.3	-0.2	-0.5	2.2	1.9	1.3	1.4	1.5	-1.2	-0.9	-0.2	0.2	-1.4
	Bank 55	-0.8	0.1	-0.8	-0.8	-0.7	-0.2	-0.2	-0.2	-0.5	0.9	0.1	0.0	0.2	0.1	0.6	2.1	1.9	0.7	0.9	0.0
	Bank 56	0.7	0.3	-0.5	-0.2	0.0	-1.4	-1.5	-0.6	-0.8	-0.3	1.7	1.2	1.1	1.9	1.4	-0.1	0.1	0.3	-0.4	-0.2
	Bank 57	0.1	-0.2	-0.7	-0.1	0.1	-0.4	-0.4	-0.4	-0.4	-0.3	-0.9	-1.1	-1.5	-1.1	-1.5	-0.9	-0.8	-1.2	-1.5	-1.5
	Bank 58	0.6	0.0	-0.6	-0.6	-0.4	1.0	1.0	1.5	1.4	0.9	0.6	0.5	0.5	0.8	0.2	1.2	0.9	1.1	-0.1	1.2
	Bank 59	-0.6	-1.0	-1.4	1.5	-0.6	-1.5	-1.3	-1.4	-0.5	-1.4	0.5	-0.4	-0.2	-0.3	0.1	2.0	3.7	2.0	-0.9	1.4
	Bank 60	2.8	1.2	1.5	2.1	0.7	-1.5	-2.5	-1.2	1.5	-0.7	0.3	0.6	-0.1	0.2	0.4	3.6	2.2	2.9	2.1	0.8
	Bank 61	-0.5	-0.4	-1.0	-1.0	-1.1	-4.4	-3.0	-3.0	-2.5	-1.3	0.4	0.0	0.4	0.8	0.7	-0.4	0.4	-0.2	0.0	-0.5
	Bank 62	0.1	-0.2	-0.2	0.8	0.2	0.2	-0.1	0.3	-0.1	0.3	0.4	0.2	0.0	0.1	0.1	-0.9	-0.6	-0.1	0.2	0.1
	Bank 63	1.3	0.5	0.6	2.1	0.1	0.5	0.4	0.2	-0.1	0.0	-0.1	0.2	-0.1	-0.5	0.4	-0.3	-1.0	0.2	2.1	-0.9
	Bank 64	0.3	0.5	-1.7	0.0	-0.4	0.9	1.2	0.4	-1.0	1.0	1.2	1.4	1.2	1.6	1.4	-1.1	-1.0	-1.6	-0.9	-1.6
	Bank 65	0.7	0.8	0.0	0.4	0.8	0.3	0.2	1.0	0.3	1.1	-0.6	-0.5	-0.5	-0.4	-0.5	-1.2	-0.9	-0.2	-0.2	0.1
	Bank 66	-0.2	-0.5	-0.8	-1.1	-1.1	1.1	0.8	0.5	0.6	0.4	0.2	0.1	0.0	0.1	0.5	0.2	0.8	0.7	-0.8	-0.4
	Bank 67	1.4	0.6	-0.6	-0.4	-0.9	-0.1	-0.4	-0.2	1.0	0.4	-1.7	-1.4	-1.1	-1.0	-1.3	1.6	0.7	-0.6	-0.3	-0.5
	Bank 68	-0.1	-0.7	-0.7	-0.6	-0.1	-0.1	0.4	1.4	1.2	1.7	0.5	0.9	1.2	0.9	1.5	-0.4	-0.9	-0.8	-0.8	-0.7
	Bank 69	-0.6	-0.8	-1.0	-0.6	-0.1	-0.1	0.1	0.1	0.5	0.1	2.0	1.8	1.8	2.3	2.0	-0.4	-0.2	0.0	-0.5	0.1
	Bank 70	-0.6	-0.8	-0.8	-1.0	-0.3	-1.4	-1.3	-1.1	-0.7	-1.0	0.5	0.5	0.1	0.4	0.0	-0.5	-0.2	0.1	-0.4	0.4
	Bank 71	0.8	0.2	0.6	0.2	0.3	-0.2	-0.4	-0.2	0.1	-0.4	-1.0	-0.6	-0.4	-0.2	0.1	-0.1	-0.6	0.0	-0.1	-0.2
	Bank 72	-0.2	-0.3	0.1	1.0	1.0	0.8	1.0	0.5	0.4	0.4	-1.4	-1.3	-1.4	-1.3	-1.2	0.3	-0.9	-0.6	-0.4	-0.6
	Bank 73	-0.4	-0.5	-0.9	-0.7	-0.3	0.9	1.8	1.4	1.3	1.6	0.0	-0.1	-0.1	0.2	0.1	0.0	0.7	0.5	-0.3	0.4
	Bank 74	0.8	0.4	0.4	0.5	0.3	0.1	-0.4	-0.2	0.4	-0.2	-1.1	-1.3	-1.6	-1.3	-1.1	-0.2	-0.2	0.6	-0.3	-0.8
	Bank 75	-0.6	-0.5	-0.3	-0.1	-0.2	0.2	0.0	-0.7	-0.3	0.1	-1.3	-1.4	-1.3	-1.1	-1.2	-0.2	-0.4	0.5	0.0	0.7
	Bank 76	-0.4	-0.9	-0.7	-1.3	-0.5	1.3	1.3	0.6	0.9	0.4	-0.8	-0.8	-1.0	-1.2	-0.5	-0.4	-0.5	-0.3	1.1	-1.2
	Bank 77	-0.6	-1.4	-1.4	-1.1	-0.8	1.1	1.2	1.1	0.1	1.7	-0.8	-0.9	-0.6	-0.5	-0.4	-0.5	-0.9	-0.7	-1.0	0.2
	Bank 78	-0.2	-0.4	-1.3	-1.0	-0.9	0.6	1.0	1.0	1.5	0.4	1.0	0.4	0.2	0.1	0.3	-0.8	-0.6	0.2	-0.3	-0.3
	Bank 79	0.0	0.4	-1.1	-1.2	-0.6	-0.4	-0.3	-0.6	0.3	0.3	1.2	0.7	0.3	0.4	0.6	0.3	1.3	0.7	0.3	0.8
	Average	0.1	-0.2	-0.5	-0.1	-0.2	-0.2	-0.1	0.0	0.2	0.2	0.1	0.0	-0.1	0.1	0.2	0.1	0.1	0.2	-0.1	-0.2
1	Bank 80	1.4	1.0	1.0	1.4	0.2	0.6	0.0	-1.2	-1.1	0.5	-0.9	-1.2	-2.0	-2.1	-1.7	0.1	1.0	2.8	2.9	0.8
	Bank 81	-0.4	-0.7	-0.6	0.2	-0.1	0.2	0.4	1.0	0.8	1.7	-1.0	-1.1	-1.1	-0.9	-1.3	0.2	0.1	-0.4	-0.4	-1.5
	Bank 82	-0.7	-1.1	-1.0	-1.1	-0.7	0.1	-0.2	0.3	0.3	0.6	0.3	0.1	0.2	0.6	0.4	-0.7	-0.4	-0.8	-1.0	-1.2
	Bank 83	-0.9	-1.3	-1.4	-1.3	-0.7	0.0	0.3	0.3	0.6	0.7	1.3	1.4	1.5	1.5	1.3	-0.7	-1.2	-1.0	-1.4	-1.5
	Bank 84	-0.4	-1.1	-0.7	-1.2	-1.0	0.3	0.5	1.4	1.1	0.8	0.5	0.4	0.4	0.0	0.0	-0.5	-0.5	-1.3	-0.7	-0.4
	Bank 85	-0.7	-0.7	-0.6	-0.8	-0.8	1.9	1.8	1.1	0.0	1.4	-2.1	-2.1	-2.4	-2.5	-2.0	-1.4	-1.0	0.3	1.9	0.0
	Bank 86	0.6	-0.6	-0.7	-0.7	-0.7	0.3	1.0	1.1	1.7	1.5	-1.4	-1.1	-1.2	-1.1	-1.3	0.4	-0.7	-0.6	-1.1	-0.6
	Bank 87	0.1	-0.3	-1.1	-1.1	-0.7	0.9	0.5	0.3	0.0	0.3	0.0	0.0	0.2	0.0	0.3	-1.4	-0.9	-0.7	0.1	-0.4
	Bank 88	-0.6	-0.6	-0.8	-1.2	-0.5	0.6	0.5	0.8	0.8	1.6	0.4	0.1	-0.2	-0.5	0.2	-0.6	-0.2	-0.3	0.1	-1.5
	Bank 89	1.6	0.8	0.0	-0.4	-0.4	1.5	0.9	1.2	1.9	2.2	-0.8	-0.8	-1.3	-1.5	-1.5	-0.9	-0.2	-0.3	-0.9	-1.2
	Bank 90	-0.1	-0.1	-1.3	-0.9	-0.2	-0.4	-1.1	-0.2	-0.2	0.4	2.0	1.9	1.2	1.9	1.8	-0.6	0.4	0.0	0.4	-1.1
	Bank 91	-0.3	-0.4	-1.3	-0.8	-0.7	-0.4	-0.3	0.1	-1.1	-0.2	-0.4	-0.4	-0.4	-0.7	-0.4	1.3	1.1	0.5	2.2	1.1
	Bank 92	1.2	-0.1	-1.1	-3.9	-1.2	-0.1	-1.3	-0.7	0.4	-0.3	-0.5	-0.8	-0.4	0.1	1.7	0.9	2.4	1.3	-0.2	-0.4
	Bank 93	0.6	-0.7	-0.3	-0.5	0.9	1.2	1.5	1.6	1.8	0.8	-1.1	-1.3	-1.3	-1.4	-1.7	-0.6	-1.0	-0.8	-0.8	0.7
	Bank 94	0.5	2.8	0.0	-0.6	-0.4	1.0	-0.7	1.7	0.9	0.9	-0.1	-0.6	-0.1	-0.6	-0.5	-0.5	1.8	-1.4	-0.1	-0.3
	Bank 95	-0.2	-0.1	0.9	1.8	1.3	0.0	0.1	0.5	0.4	0.6	-2.1	-2.1	-2.2	-2.2	-2.0	1.2	1.1	0.8	1.0	0.8
	Bank 96	-0.9	-1.1	-1.4	-1.3	-0.4	0.1	0.6	0.9	1.3	1.6	-0.8	-0.7	-0.8	-0.8	-0.8	0.2	-0.1	-0.5	-0.8	-1.1
	Bank 97	0.0	-1.1	-1.0	-0.8	-1.5	1.0	1.5	1.6	1.8	2.0	-2.1	-1.9	-1.9	-1.7	-1.7	-0.5	-1.2	-1.2	-1.2	-1.5
	Bank 98	-0.4	-0.2	-1.1	-0.6	-0.6	1.7	1.6	1.9	2.1	1.6	-1.1	-1.0	-1.2	-1.2	-1.3	-1.3	-1.2	-1.3	-1.4	-0.7
	Bank 99	-0.5	-0.3	-0.4	0.0	0.5	1.1	0.4	0.7	0.2	0.7	0.0	-0.1	-0.1	0.4	0.5	-0.8	0.1	-0.2	0.1	-0.6
	Bank 100	-1.2	-1.2	-1.1	-0.7	0.0	1.1	1.8	1.8	1.3	1.3	-1.0	-0.7	-0.5	-0.6	-0.6	-0.2	-1.3	-1.4	-0.7	-0.8
	Bank 101	-0.7	-0.6	-1.1	-1.4	-1.0	1.3	0.4	0.0	-0.6	-0.1	-0.7	-1.2	-1.0	-0.9	-0.8	-0.9	0.5	1.0	1.7	1.2
	Bank 102	-0.7	-1.1	-0.5	-0.7	-0.9	0.2	-0.6	-1.0	-1.5	0.1	-1.3	-1.3	-1.8	-2.1	-1.8	0.3	1.0	1.8	2.8	1.0
	Bank 103	-1.5	-1.3	-1.0	-0.6	-0.9	0.6	1.3	1.5	1.2	2.0	-0.5	-0.6	-0.4	-0.5	-0.9	-0.8	-1.5	-1.4	-0.8	-1.5
	Bank 104	0.1	-0.5	-1.3	-0.5	-0.7	0.8	0.6	1.7	1.1	1.7	-1.3	-1.1	-0.8	-0.9	-0.7	0.3	0.3	-1.1	-0.4	-1.2
	Average	-0.2	-0.4	-0.7	-0.7	-0.4	0.6	0.5	0.7	0.6	1.0	-0.6	-0.7	-0.7	-0.7	-0.6	-0.3	-0.1	-0.2	0.0	-0.5

Note: 1/ 104 regional banks are grouped into quartiles based on asset size. All individual banks were ranked in terms of asset size, from the largest to the smallest. Bigger banks were grouped into the fourth quartile while smaller banks were grouped in the first quartile.

2/ The numbers shown in each cell indicate an average z-score of banks in the group. The higher the z-score is, the more sound the bank is compared to its peers. The color of the cell corresponds to the z-score. The indicators with the z-score of the 90th percentile or above are in dark green while the indicators with the z-score of the 10th percentile or below are in dark red. Indicators with the z-score falling in between these two thresholds are shaded in orange or yellow.

Source: AMRO staff calculations, based on data from the Japanese Bankers Association

Table A2.5. DuPont Analysis of Each Group of Regional Banks, Classified by Prefecture

Region	Prefecture income (thousand yen)	Share of Senior Population	ROE					Dupont Analysis: Efficiency : Net profits / Operating income					Income generation : Operating income /Total Asset					Leverage : Total Asset / Total Equity				
	FY2014	FY2017	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018
Kanto-Koshinetsu	60,415,546	23.0	1.8	0.9	0.1	0.2	-0.5	0.5	-0.1	-0.8	-0.6	-0.9	0.1	1.4	1.0	1.2	0.8	0.9	1.1	0.6	0.5	-0.5
	26,642,483	24.8	-0.3	-0.2	-0.2	0.0	0.2	0.1	0.1	0.0	0.3	0.3	-0.1	-0.1	-0.1	-0.3	-0.2	-0.5	-0.5	-0.2	-0.3	-0.2
	21,016,915	26.0	0.2	0.2	-0.7	-0.1	-0.3	0.7	0.8	-0.3	0.3	-0.4	-0.2	-0.8	-1.0	-1.2	-0.9	-0.2	-0.1	0.1	-0.1	0.2
	18,403,829	27.1	0.6	0.4	-0.1	0.1	0.2	1.3	1.3	0.5	0.8	0.7	-0.2	-0.4	-0.4	-0.6	-0.6	-0.7	-0.7	-0.5	-0.6	-0.6
	9,012,620	28.3	-0.2	-0.1	-0.5	-0.4	-0.3	0.1	0.1	-0.4	-0.3	-0.3	-0.1	-0.3	-0.1	-0.3	-0.3	-0.4	-0.2	0.1	0.2	0.2
	6,343,577	27.4	1.2	1.5	0.7	0.2	0.4	1.4	1.7	0.9	0.3	0.4	-0.1	0.0	0.2	-0.3	-0.5	-0.3	-0.3	0.0	0.0	-0.1
	6,238,313	31.3	0.3	0.4	-0.3	0.4	-0.4	0.4	0.3	-0.3	0.2	-0.5	-0.2	-0.2	-0.1	-0.8	-0.6	0.1	0.3	0.6	0.6	1.1
	6,109,028	28.9	0.2	0.0	0.0	1.0	0.2	1.1	1.1	0.7	1.5	0.5	-0.1	-0.3	-0.4	-0.1	0.4	-1.1	-1.1	-0.9	-1.0	-0.7
	5,950,452	31.1	-0.4	-0.5	-0.6	-0.7	-0.6	0.2	0.1	-0.5	-0.4	-0.2	-0.1	-0.3	-0.2	0.4	-0.1	-0.9	-0.9	-0.7	-0.6	-0.4
	2,352,709	29.8	-0.5	-0.7	-1.1	-1.3	-0.7	0.6	0.3	-0.7	-1.1	-0.5	-0.3	-1.1	-0.5	-0.4	-0.5	-1.4	-1.3	-1.0	-0.9	-0.8
Hokkaido	13,823,619	30.7	0.5	0.4	-0.2	-0.7	0.2	0.3	0.0	-0.4	-0.8	0.0	0.1	-0.6	-0.5	-0.8	-0.8	0.7	0.7	1.1	1.1	1.2
Tokai	26,296,107	24.6	-0.7	-1.1	-1.2	-1.3	-0.5	-0.2	-0.5	-0.8	-0.9	-0.3	-0.3	-0.9	-0.9	-0.9	-0.8	-1.0	-0.9	-0.7	-0.7	-0.8
	11,930,115	29.1	0.5	0.6	0.7	-0.3	-2.8	0.8	0.7	0.5	0.1	-1.6	0.1	0.9	1.2	1.5	1.7	-1.0	-1.0	-1.0	-1.1	-1.0
	5,738,601	29.0	-0.6	-0.8	-1.1	-0.8	-0.3	-0.1	-0.3	-0.8	-0.4	0.0	-0.2	-0.8	-0.8	-0.9	-0.6	-0.7	-0.6	-0.5	-0.6	-0.5
	5,545,258	29.3	0.3	-0.3	-0.8	-0.9	-0.4	0.6	-0.1	-0.8	-0.6	-0.3	-0.3	-0.5	-0.6	-0.2	-0.9	-0.3	0.0	0.0	-0.1	0.0
Kinki	26,624,521	27.2	0.9	0.8	0.2	0.4	-0.6	0.0	-0.1	-0.4	-0.3	-1.1	0.0	0.5	0.4	-0.1	0.3	1.3	0.9	1.1	1.0	1.2
	15,756,731	28.3	0.1	-0.4	-0.5	-0.4	-0.5	-0.3	-1.0	-1.0	-0.9	-0.9	-0.2	-0.4	-0.5	-0.7	-0.7	1.0	1.2	1.6	1.6	1.8
	7,903,445	28.6	-0.6	-0.9	-1.3	-1.4	0.0	1.1	0.9	0.3	0.6	1.7	-0.5	-1.5	-1.6	-1.8	-1.7	-1.8	-1.6	-1.8	-2.3	-2.0
	4,424,365	25.3	-0.1	-0.5	-0.6	-0.7	0.0	0.9	0.4	0.4	0.5	0.6	-0.2	-0.8	-0.7	-1.2	-1.2	-1.1	-1.1	-1.0	-1.1	-0.9
	3,486,255	30.3	0.0	-0.7	-0.2	0.0	0.1	0.2	-0.4	-0.1	0.4	0.2	-0.3	-1.3	-1.7	-1.3	-1.1	0.4	0.5	1.1	0.4	0.4
	2,717,023	32.2	0.2	1.0	-0.4	0.4	0.8	0.3	0.8	-0.6	0.3	0.8	-0.2	-0.8	-0.4	-0.8	-0.6	0.3	0.5	1.1	0.7	0.5
Kyushu, Okinawa	14,045,458	27.1	-0.1	-0.1	-0.6	-0.1	0.0	0.2	0.2	-0.2	0.4	0.2	-0.2	-0.4	-0.4	-0.7	-0.5	-0.5	-0.4	-0.1	-0.1	0.1
	4,297,484	30.1	0.1	0.1	-1.4	0.2	0.1	0.7	0.6	-1.3	0.6	0.4	-0.2	-0.6	-0.5	-1.0	-1.2	-0.7	-0.6	-0.1	0.2	0.6
	3,984,592	30.8	0.5	0.0	-0.4	-0.4	-0.2	0.8	0.0	-0.5	-0.3	-0.1	0.1	0.7	1.2	1.2	0.6	-1.0	-0.8	-0.8	-0.7	-0.8
	3,263,193	31.3	-0.6	-0.8	-0.6	-0.2	-0.5	-0.5	-0.7	-0.6	-0.1	-0.5	-0.2	-0.3	-0.3	-0.2	-0.2	0.4	-0.1	0.0	0.0	0.1
	3,025,067	31.8	-0.3	-0.6	-1.1	-1.0	-0.5	-0.2	-0.6	-1.2	-1.1	-0.7	-0.1	0.5	0.3	0.0	0.1	-0.4	-0.2	-0.1	-0.3	-0.3
	3,024,363	21.0	0.3	-0.2	-0.3	0.3	0.5	0.3	-0.2	-0.5	0.0	0.3	0.0	0.3	0.5	0.5	0.6	-0.4	-0.4	-0.3	-0.3	-0.5
	2,653,148	31.1	0.3	1.6	0.1	0.1	0.3	0.4	1.4	0.1	-0.1	0.2	0.0	0.4	1.0	0.2	0.5	-0.5	-0.4	-0.3	-0.4	-0.3
	2,095,531	29.2	-0.1	-0.6	-1.4	-0.6	-0.9	-0.5	-1.3	-1.9	-1.1	-1.3	0.4	2.1	2.1	1.6	1.9	-0.5	-0.2	-0.3	-0.4	-0.3
Chugoku	8,912,130	28.6	0.1	0.1	0.2	1.0	0.1	0.4	0.3	0.0	1.1	0.3	-0.1	-0.3	0.1	0.1	-0.3	-0.4	-0.2	0.3	0.0	0.0
	5,216,032	29.7	0.1	0.1	-0.3	-0.1	-0.1	0.7	0.9	0.2	0.6	0.1	-0.2	-0.9	-0.8	-0.7	-0.6	0.1	0.3	0.0	-0.1	-0.3
	4,401,348	33.4	1.5	1.4	1.4	0.8	0.6	0.3	0.0	0.0	0.1	0.1	0.2	1.3	0.5	0.9	0.6	0.9	1.3	1.3	0.4	0.5
	1,699,429	33.6	-0.4	-0.7	-0.3	-0.4	-0.4	-0.1	-0.4	-0.2	-0.4	-0.3	0.0	0.0	-0.1	0.0	0.3	-0.6	-0.4	-0.1	0.1	0.2
	1,337,529	31.0	0.2	-0.2	-1.1	-1.1	-0.6	0.2	-0.3	-1.3	-1.2	-0.8	-0.1	-0.1	-0.2	-0.3	-0.4	0.0	0.1	0.5	0.5	0.6
Tohoku	6,534,558	27.2	-0.1	-0.8	-0.7	-0.8	-0.6	0.4	-0.6	-0.3	-0.5	-0.4	-0.4	-1.4	-1.1	-1.3	-1.0	0.2	0.3	0.3	0.2	0.2
	5,536,560	30.2	0.9	0.3	-0.9	-2.1	-0.6	0.4	-0.2	-1.3	-2.1	-1.0	-0.3	-0.4	-0.2	-0.7	-0.7	1.2	1.3	1.6	1.8	1.9
	3,488,246	31.9	-0.2	-0.5	-0.6	-1.1	-0.5	0.0	-0.4	-0.6	-1.1	-0.6	-0.3	-1.0	-0.7	-0.8	-0.3	0.3	0.2	0.5	0.4	0.3
	3,177,145	31.8	0.3	0.1	-0.4	-0.8	-0.8	-0.1	-0.6	-1.0	-1.1	-1.1	-0.2	-0.2	0.0	-0.2	-0.6	1.1	1.2	1.5	1.4	1.7
	2,927,508	32.2	-0.1	-0.6	-1.1	-1.0	-0.8	0.0	-0.6	-1.3	-1.0	-1.1	-0.2	-0.3	-0.1	-0.1	0.0	0.0	0.1	0.4	0.2	0.0
	2,558,180	35.6	0.2	0.0	-1.1	-1.2	-0.5	0.2	-0.3	-1.3	-1.3	-0.7	-0.2	-0.5	0.5	-0.3	-0.3	0.1	0.0	0.3	0.4	0.2
Hokuriku	3,407,757	31.6	-0.2	-0.2	-0.1	0.1	0.0	0.4	0.3	0.1	0.5	0.4	-0.1	-0.4	-0.1	0.0	0.0	-0.9	-0.7	-0.5	-0.6	-0.7
	3,405,574	28.8	-0.2	-0.2	-0.5	-0.3	-0.1	0.2	0.2	0.3	0.5	0.4	-0.3	-0.6	-0.5	-1.4	-1.3	-0.6	-0.6	-0.3	-0.2	0.1
	2,347,117	29.8	-0.6	0.0	-0.8	-1.0	-0.9	-0.9	-0.4	-1.1	-1.2	-1.2	0.0	0.2	0.4	0.0	0.2	0.4	0.4	0.7	0.7	0.8
Shikoku	3,516,676	32.1	0.4	0.0	-0.5	0.0	0.1	1.2	0.9	0.3	0.7	0.4	-0.2	-0.4	-0.5	-0.6	-0.3	-0.5	-0.5	-0.5	-0.7	-0.7
	2,835,364	31.1	-0.1	-0.4	-0.2	-0.5	-0.4	0.4	0.1	0.0	-0.1	-0.2	-0.1	-0.1	-0.2	0.3	0.0	-1.0	-0.8	-0.7	-0.8	-0.7
	2,219,318	32.4	0.1	0.0	0.1	0.7	0.6	0.6	0.6	0.7	1.3	1.0	-0.1	0.3	0.1	0.0	0.1	-1.0	-0.8	-0.9	-0.9	-1.0
	1,866,110	34.2	0.0	-0.5	-0.4	-0.3	-0.3	0.1	-0.5	-0.5	-0.4	-0.4	-0.1	-0.2	-0.1	-0.1	0.0	-0.2	-0.2	0.0	-0.2	-0.2

Note: 1/ The numbers shown in each cell indicate an average z-score of banks in the group. The higher the z-score is, the more sound the bank is compared to its peers, except in terms of leverage ratio. The color of the cell corresponds to the z-score. The indicators with the z-score of the 90th percentile or above were denoted in dark green while the indicators with the z-score of the 10th percentile or below are denoted in dark red. Indicators with a z-score falling in between these two thresholds are shaded in orange or yellow. Since leverage is not a focus of this study, we use shades of grey. The darker a color is, the higher leverage a bank has.

2/ Senior population comprises citizens aged 65 years old and higher.

Source: AMRO staff calculations, based on data from the Japanese Bankers Association and the Japanese government's statistics portal (e-Stat)

Table A2.6. Income Decomposition of Each Group of Regional Banks, Classified by Prefectures

Region	Prefecture income (thousand yen)	Share of Senior Population	ROA (%) : Net profits / Total Assets						Income Decomposition: Interest Income: Net Interest Margin / Operating Inome (%)					Fee Income: Fee and Commission / Operating Income (%)					Other Income: Trading and Investment Income / Operating Income (%)				
	FY2014	FY2017	FY2014	FY2015	FY2016	FY2017	FY2018	Avg	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018	FY2014	FY2015	FY2016	FY2017	FY2018
Kanto-Koshinetsu	60,415,546	23.0	1.2	0.3	-0.2	0.1	-0.4	0.2	-1.7	-1.0	-0.6	-0.6	0.4	0.2	0.2	0.0	0.2	-0.1	1.6	0.8	0.6	0.5	-0.4
	26,642,483	24.8	0.0	0.1	-0.1	0.1	0.2	0.0	0.3	0.3	0.4	0.7	0.3	0.0	-0.2	-0.1	0.1	-0.1	0.1	0.1	-0.1	-0.6	-0.3
	21,016,915	26.0	0.3	0.2	-0.7	-0.2	-0.3	-0.2	-0.1	0.2	0.4	0.2	-1.0	0.7	1.1	1.5	1.7	1.1	-0.2	-0.8	-1.1	-1.1	0.6
	18,403,829	27.1	1.0	0.8	0.1	0.3	0.4	0.5	-0.1	-0.2	-0.1	-0.1	-0.3	1.1	0.8	0.8	1.2	0.9	-0.3	-0.2	-0.2	-0.6	-0.4
	9,012,620	28.3	0.0	0.0	-0.5	-0.4	-0.2	-0.2	0.0	-0.3	-0.4	-0.4	-0.4	0.6	0.3	0.3	0.8	0.5	-0.2	0.4	0.4	0.1	0.2
	6,343,577	27.4	1.4	1.5	0.6	0.0	0.3	0.8	-0.6	-0.5	0.3	0.0	-0.4	0.9	0.4	0.4	1.0	1.0	0.6	0.7	-0.2	-0.3	-0.2
	6,238,313	31.3	0.2	0.2	-0.5	-0.1	-0.5	-0.1	-1.9	-1.7	-0.7	-1.2	-1.4	0.4	0.4	0.8	0.7	1.0	2.5	1.8	0.3	1.0	0.7
	6,109,028	28.9	0.9	0.6	0.5	1.5	0.4	0.8	1.0	0.9	0.1	-0.8	0.2	0.2	0.2	-0.1	-0.2	0.3	-0.8	-0.8	0.3	1.2	-0.2
	5,950,452	31.1	0.1	0.1	-0.2	-0.3	-0.4	-0.2	-0.1	-0.3	-1.2	-1.2	0.0	-1.1	-1.3	-1.9	-1.6	-1.1	0.4	0.8	2.4	2.4	0.6
	2,352,709	29.8	0.1	0.0	-0.7	-1.0	-0.5	-0.4	0.6	-0.2	-0.9	-0.8	-0.6	0.3	-0.3	-0.3	0.0	0.0	-0.6	0.7	1.3	1.1	1.2
Hokkaido	13,823,619	30.7	0.1	-0.1	-0.6	-0.9	-0.2	-0.4	-0.3	-0.5	-0.3	-0.4	-0.4	2.3	2.0	2.1	2.0	1.9	-0.8	-0.3	-0.4	-0.4	-0.5
Tokai	26,296,107	24.6	-0.4	-0.8	-0.9	-1.0	-0.3	-0.7	0.0	0.0	-0.1	-0.2	-0.6	0.3	0.3	0.2	0.6	0.4	-0.1	-0.2	0.1	-0.1	0.4
	11,930,115	29.1	1.3	1.5	1.5	0.4	-2.6	0.4	0.4	0.3	0.1	0.6	0.4	-0.8	-0.9	-1.1	-0.9	-0.9	0.2	0.3	0.6	-0.1	0.0
	5,738,601	29.0	-0.4	-0.6	-0.9	-0.6	-0.2	-0.5	-0.5	-0.5	-0.4	-0.3	-0.3	1.1	1.1	1.2	1.1	1.4	-0.5	-0.5	-0.4	-0.2	-0.5
	5,545,258	29.3	0.4	-0.3	-0.8	-0.8	-0.4	-0.4	-0.9	-0.9	-1.5	-0.4	-0.3	0.4	0.3	-0.1	0.7	0.5	0.7	0.6	1.6	-0.2	-0.2
Kinki	26,624,521	27.2	0.2	0.1	-0.4	-0.1	-0.7	-0.2	-1.4	-1.3	-1.0	-1.1	-0.9	1.4	1.0	1.0	1.3	1.7	0.3	0.6	0.3	0.5	-0.1
	15,756,731	28.3	-0.4	-0.9	-1.0	-0.9	-0.7	-0.8	-0.6	-0.4	-0.2	-0.2	0.2	1.8	1.6	1.6	1.8	1.6	-0.4	-0.4	-0.5	-0.7	-1.0
	7,903,445	28.6	0.2	-0.1	-0.6	-0.4	0.8	0.0	-0.3	-0.2	-0.5	0.4	-1.7	0.1	0.1	0.0	0.2	-0.7	0.4	0.1	0.6	-0.7	2.0
	4,424,365	25.3	0.4	0.1	-0.2	-0.2	0.3	0.1	-0.5	-0.9	-0.4	-0.5	-1.8	0.2	0.0	0.2	0.3	-0.2	0.6	1.2	0.4	0.1	1.6
	3,486,255	30.3	-0.3	-0.9	-0.6	-0.3	-0.1	-0.4	0.0	0.6	-0.1	-0.3	-1.5 #	-0.1	0.1	-0.5	-0.5	-0.3	0.2	-0.8	0.4	0.5	1.9
	2,717,023	32.2	0.0	0.5	-0.8	-0.1	0.5	0.0	0.6	-0.6	-0.1	0.1	-0.2	-0.1	-0.3	0.2	0.3	0.2	-0.8	0.8	0.0	-0.2	0.4
Kyushu, Okinawa	14,045,458	27.1	0.0	0.0	-0.6	-0.1	-0.1	-0.2	0.2	0.1	0.4	0.2	0.6	0.1	-0.1	-0.1	-0.1	-0.2	-0.4	-0.2	-0.4	-0.2	-0.7
	4,297,484	30.1	0.4	0.4	-1.3	0.0	-0.1	-0.1	-0.1	-0.4	0.0	0.0	0.2	0.9	0.7	0.5	0.9	0.6	-0.7	-0.1	-0.3	-0.6	-0.5
	3,984,592	30.8	1.0	0.5	0.0	-0.1	0.0	0.3	0.7	0.2	0.2	1.0	1.4	0.0	-0.2	-0.6	-0.7	-0.7	-0.4	0.3	0.4	-0.5	-0.8
	3,263,193	31.3	-0.7	-0.8	-0.7	-0.3	-0.5	-0.6	0.1	0.3	0.3	0.3	0.8	0.8	0.6	0.3	0.5	0.3	-0.7	-0.8	-0.3	-0.5	-0.9
	3,025,067	31.8	-0.1	-0.5	-1.0	-0.9	-0.4	-0.6	-0.3	0.4	0.7	0.7	0.9	-0.3	-0.2	-0.2	-0.3	-0.4	0.6	-0.1	-0.4	-0.4	-0.6
	3,024,363	21.0	0.4	0.0	-0.2	0.3	0.6	0.2	0.9	0.9	0.7	0.8	0.4	-0.4	-0.5	-0.6	-0.6	-0.7	-0.9	-0.8	-0.4	-0.3	0.3
	2,653,148	31.1	0.5	1.9	0.1	0.1	0.2	0.6	0.5	-0.4	1.0	0.5	0.8	0.4	-0.1	0.3	0.0	0.0	-0.4	0.9	-1.0	-0.2	-0.5
	2,095,531	29.2	0.1	-0.5	-1.3	-0.5	-0.7	-0.6	0.8	0.6	1.7	1.1	1.7 #	-1.3	-1.1	-0.8	-0.9	-0.7	0.3	0.3	-1.1	-0.4	-1.2
Chugoku	8,912,130	28.6	0.2	0.2	0.0	0.8	0.1	0.2	-1.3	-1.7	-1.6	0.1	-0.7	0.7	0.2	0.2	0.5	0.4	1.3	2.1	1.8	-0.4	0.6
	5,216,032	29.7	0.2	0.3	-0.2	0.1	0.0	0.1	-0.5	-1.0	-0.9	-0.7	-0.7	0.4	0.1	0.1	0.3	-0.1	0.2	0.8	0.6	0.1	0.1
	4,401,348	33.4	0.8	0.4	0.4	0.5	0.3	0.5	0.2	0.0	-0.7	-0.3	0.1	-1.1	-1.3	-1.6	-1.3	-1.1	-0.2	-0.2	0.6	-0.3	-0.8
	1,699,429	33.6	-0.2	-0.5	-0.3	-0.3	-0.3	-0.3	0.2	-0.1	-0.4	-0.7	-0.1	-0.6	-0.7	-1.1	-1.3	-1.2	-0.4	-0.2	0.3	0.9	0.2
	1,337,529	31.0	0.1	-0.3	-1.1	-1.1	-0.7	-0.6	0.9	0.5	0.3	0.0	0.3 #	0.0	0.0	0.2	0.0	0.3	-1.4	-0.9	-0.7	0.1	-0.4
Tohoku	6,534,558	27.2	-0.2	-0.9	-0.8	-0.8	-0.5	-0.7	0.1	0.2	0.9	0.6	0.4	0.5	0.3	0.4	0.1	0.2	-0.2	-0.2	-0.9	-0.4	-0.2
	5,536,560	30.2	0.2	-0.3	-1.2	-2.0	-0.7	-0.8	-0.5	-1.4	-0.6	-0.3	-0.5	1.2	1.0	0.9	1.4	1.8	0.2	1.3	0.6	-0.2	-0.2
	3,488,246	31.9	-0.4	-0.6	-0.8	-1.1	-0.5	-0.7	0.7	0.6	0.9	0.5	1.1	0.1	-0.1	-0.1	-0.4	0.0	-0.6	-0.3	-0.5	0.1	-0.9
	3,177,145	31.8	-0.2	-0.5	-0.9	-1.1	-0.9	-0.7	0.0	-0.2	-0.1	0.9	0.6	0.3	0.2	0.1	0.3	0.6	-0.2	0.3	0.4	-0.9	-0.7
	2,927,508	32.2	-0.1	-0.6	-1.1	-0.9	-0.7	-0.7	-0.4	-0.2	-0.4	0.4	-0.2	0.3	0.0	0.0	0.1	0.0	0.0	-0.2	0.2	-0.5	0.4
	2,558,180	35.6	0.0	-0.1	-1.1	-1.2	-0.5	-0.6	-0.6	-1.7	-0.4	-0.3	-0.7	0.6	-0.1	0.0	0.1	0.3	0.4	2.0	0.4	0.4	0.8
Hokuriku	3,407,757	31.6	0.3	0.2	0.1	0.4	0.2	0.2	0.5	0.1	-0.2	-0.3	0.3	0.1	-0.1	-0.5	-0.3	-0.1	-0.4	0.2	0.7	0.8	0.0
	3,405,574	28.8	-0.1	0.1	-0.3	-0.2	-0.2	-0.1	-0.8	-0.7	0.0	0.1	-0.6	-0.1	-0.6	-0.2	-0.2	0.0	1.6	1.7	0.4	-0.1	0.1
	2,347,117	29.8	-0.7	-0.3	-1.0	-1.1	-0.9	-0.8	-0.1	-0.5	-0.3	-0.7	-0.2	-0.3	-0.6	-0.4	-0.4	-0.1	0.6	1.2	0.8	1.3	0.6
Shikoku	3,516,676	32.1	0.9	0.5	-0.1	0.4	0.3	0.4	0.9	0.8	0.8	0.8	0.1	-1.1	-1.1	-1.1	-0.9	-1.1	-0.6	-0.5	-0.6	-0.8	-0.6
	2,835,364	31.1	0.3	0.0	0.2	-0.1	-0.1	0.1	-0.1	0.0	-0.9	-0.4	-0.7	-0.6	-0.6	-0.6	-0.2	-0.1	0.6	0.3	1.4	0.5	0.5
	2,219,318	32.4	0.7	0.6	0.6	1.2	0.9	0.8	1.0	1.2	0.9	0.8	0.7	-0.9	-0.7	-0.8	-0.8	-0.7	-0.2	-0.8	-0.5	-0.4	-0.4
	1,866,110	34.2	0.1	-0.5	-0.5	-0.4	-0.3	-0.3	-0.2	-0.1	-0.1	0.4	0.6	-0.7	-0.6	-0.8	-0.7	-0.7	0.6	0.3	0.6	-0.1	-0.3

Note: 1/ The numbers shown in each cell indicate an average z-score of banks in the group. The higher the z-score is, the more sound the bank is compared to its peers. The color of the cell corresponds to the z-score. The indicators with the z-score of the 90th percentile or above are in dark green while the indicators with the z-score of the 10th percentile or below are in dark red. Indicators with the z-score falling in between these two thresholds are shaded in orange or yellow.

2/ Senior population comprise citizens aged 65 years old and higher.

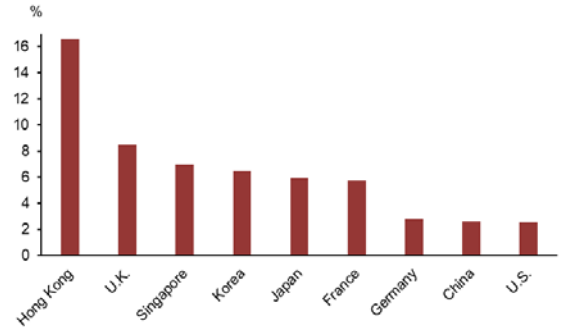
Source: AMRO staff calculations, based on data from the Japanese Bankers Association and the Japanese government's statistics portal (e-Stat)

Annex 3. Low Interest Rate Environment Pushes Life Insurers to Rebalance Portfolios and Tackle Different Mix of Risks and Challenges[26]

1. **Japan's life insurance market is among the deepest in the world.** Only behind the major financial centers and some East Asian neighbors, Japan has a mature life insurance industry whose premium income is close to 6 percent of the national GDP (Figure A3.1). Japanese life insurers (hereafter "lifers") have historically provided an important supplement to the country's social security system, offering a variety of protection- and savings-type policies against unfortunate life events (for example, life insurance) or demand for living benefits (for example, annuity). They also manage around 69 percent of the corporate defined-benefit pensions and employee pension funds[27], faced with limited competition from asset management companies.

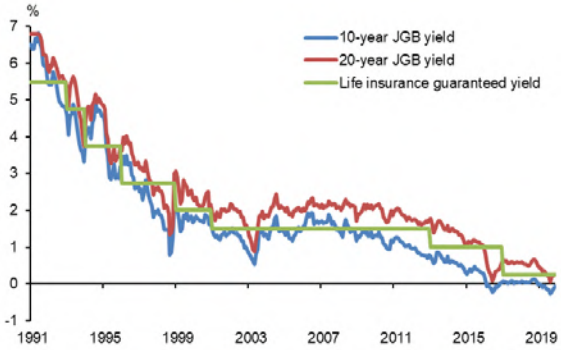
2. **The prolonged period of low interest rate environment presents challenges to the industry's profitability.** The profits of a representative lifer consist of an interest margin, an expense margin and mortality gains. For many years following the late 1990s, the interest margin stayed negative as the prevailing market interest rates kept falling (Figure A3.2). With enormous liabilities accumulated over the period at high interest rates, Japanese lifers face and will continue to face pressure to develop new sources of income. The mortality gains have been the main source of lifers' core operating profits in recent years[28], because the mortality rate of the insured, and thus obligations linked to their death events, have been lower than actuarially estimated[29]. A boost to profitability in the short term, such liabilities could materialize later especially under whole-life contracts, and the profitability of the insurers could weaken accordingly.

Figure A3.1 Life Insurance Penetration for Selected Economies



Note: Data is as of 2015 for the U.K., and 2017 for others.
Source: The World Bank

Figure A3.2 Market Interest Rates and Life Insurance Guaranteed Yield



Source: Bloomberg; Goldman Sachs.

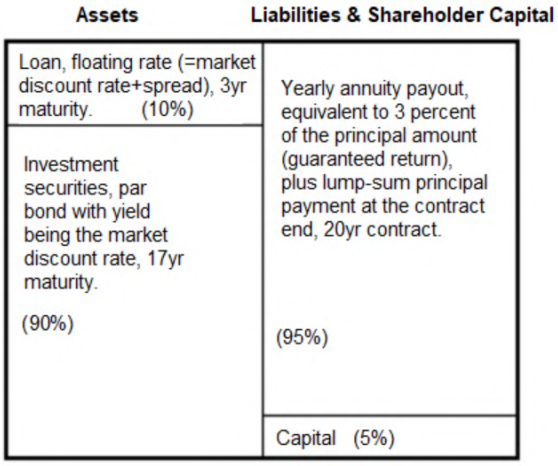
3. **The falling interest rates have eroded the solvency of Japanese lifers.** A distinctive feature of lifers' balance sheet is that their assets are typically of shorter term maturities than their liabilities. When interest rates fall, such duration mismatches result in the market value of

[26] Prepared by Wei Sun (Financial Specialist)
[27] Data as of FY 2016 based on the number of plans. See "Japanese life insurers to merge corporate pension operations", Nikkei Asian Review, March 2018.
[28] Mortality gains can be more than half of some lifers' core operating profits.
[29] The life expectancy in Japan has increased from 80.4 to 84.1 years over the 20 years to 2017.

their liabilities rising faster than that of their assets, assuming future cash flows stay the same. Consequently, their capital may decline to an inadequate level.

4. **We explain in the following exercise the impact of changing interest rates on the capital position of a representative lifer in Japan by employing a hypothetical balance sheet.** Wherever possible, we adopt parameters that can closely represent the sector on an aggregate level based on official statistics and industry sources (Figure A3.3). Among others, the allocation of assets, the guaranteed return of the liabilities, and duration mismatch of the balance sheet are all largely in line with existing positions. To proxy for liabilities, we use a "synthetic" contract, which includes annual payouts to represent annuity polices and a lump sum payment at the end to represent life policies. By using the prevailing market interest rates as the discount rate ("r" in Table A3.1), we adopt a mark-to-market approach and highlight the changing nature of the interest rate environment and its impact. In the two prescribed scenarios, the market interest rates decline from 1.5 to 0.5 (that is, a low interest rate environment) or -0.5 (that is, a lower interest rate environment) percent, respectively.

Figure A3.3 Capital Structure of the Sample Life Insurer



Note: yearly payments are assumed for loans, investment securities and annuities.
Source: The Life Insurance Association of Japan and AMRO staff calculations.

Table A3.1 Mark-to-Market Changes in Balance Sheet Composition As Interest Rates Fall

	From r=1.5	Scenario 1: To r=0.5	Scenario 2: To r=-0.5
Assets			
PV, security	90	91.27	92.41
PV, loans	10	8.73	7.59
Total	100	100	100
Liabilities & Shareholder Capital			
PV, fixed annuity	95	97.18	99.45
PV, Capital	5	2.82	0.55
Total	100	100	100

Unit: %

Note: PV=present value, r=annualized discount rate
Source: The Life Insurance Association of Japan, AMRO staff calculations.

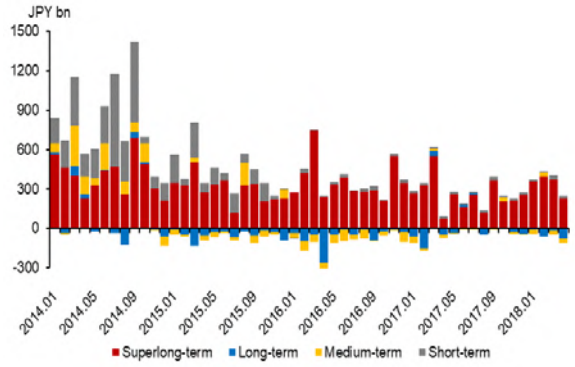
5. **Our sensitivity analysis shows the capital position of the lifer could be significantly impaired when the prevailing market interest rates fall**. Valuation for both assets and liabilities increases as interest rates fall, but the increase in the latter is more pronounced than that in the former due to their duration mismatches. As a result, capital, or the residual claim, shrinks from 5 percent to 2.82 and 0.55 percent of the total balance sheet under the two scenarios (Table A3.1). Obviously, the deterioration in capital position accelerates as rates decline from low to lower, largely due to the nonlinear nature of the present market value against the discount rate. This analysis highlights the rising vulnerabilities facing the lifers if the low interest rate environment were to persist or even deepen. It also indicates areas where lifers can potentially improve their balance sheets by, say, reducing the duration mismatch, acquiring higher-yielding assets and lowering guaranteed returns. Indeed, some have already started to

rebalance their portfolios, and perhaps naturally, they are in the meantime dealing with a different mix of risks and challenges amid such efforts.

6. **Lifers have been extending the duration of their investment securities, which puts downward pressure on the yields of longer-term JGBs.** They have purchased an average net amount of JPY 330 billion in superlong-term JGBs [30] each month since 2014 while downsizing their holdings of shorter and negative yielding ones (Figure A3.4). In alleviating the duration mismatch problem on their balance sheets, such moves may have contributed to the falling yields in the superlong segment of the domestic bond market, which would in turn adversely affect lifers' profitability later on.

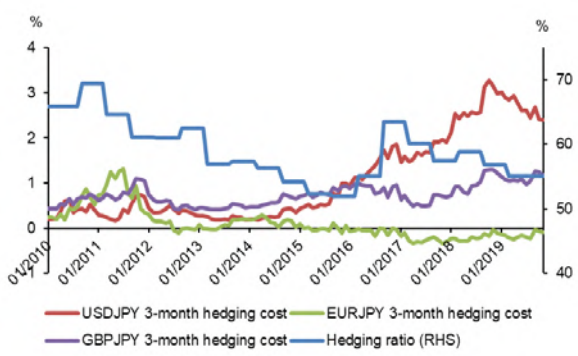
7. **Lifers have also started investing in higher-yielding foreign assets, and have to deal with the intricacies of credit and FX risks.** Over the past five years, Japanese lifers have expanded their foreign security holdings from 17 percent to 25 percent (Figure A3.5). As the resulting demand for foreign currencies has increased, FX hedging costs are no longer trivial for JPY-based investors, particularly against USD assets (Figure A3.6). With a strong incentive to boost profitability, lifers have switched into less creditworthy assets than they were accustomed to as conservative investors, or reducing their FX hedging ratios. The decline in hedging activity exerts downward pressure on the JPY when funds flow overseas. When foreign credit markets experience dramatic turns, changes in those unhedged positions may also translate into volatile exchange rate fluctuations. To the extent that credit and FX risks have become increasingly inter-connected, it is more important for Japanese lifers to rely on an integrated risk management system in their foreign ventures.

Figure A3.4 Net Purchase of JGBs by Insurance Companies



Source: Japan Securities Dealers Association.

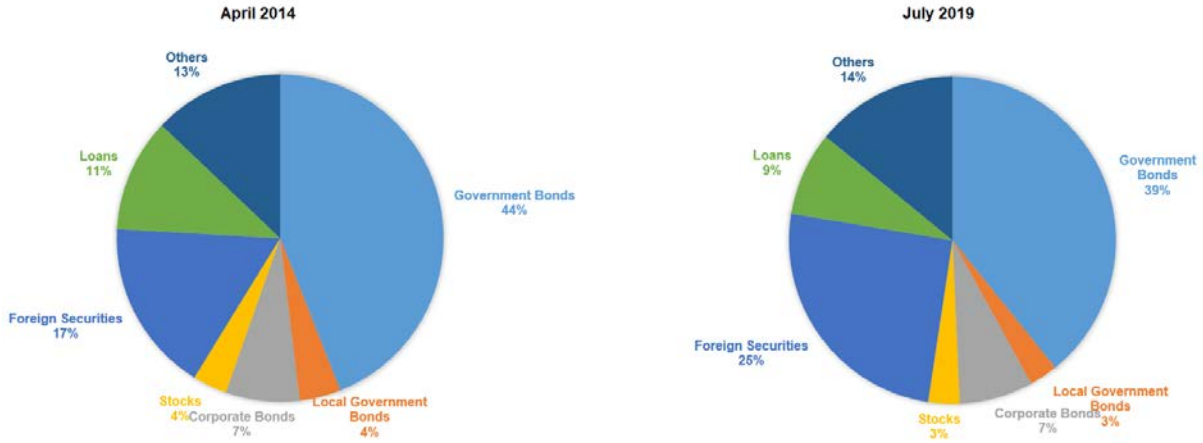
Figure A3.6 Hedging Costs and Ratios



Note: The hedging cost is the annualized 3-month forward points as a percent of the principal amount for JPY-based investors. The hedging ratio is for nine Japanese life insurers.
Source: Bloomberg.

[30] JGBs with maturity longer than 10 years are considered superlong-term.

Figure A3.5 Composition of Asset Allocation



Source: The Life Insurance Association of Japan.

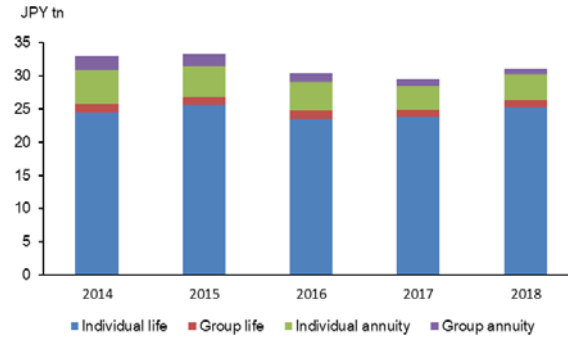
8. **Lifers' increasing acquisition of less liquid assets may test their liquidity management strength.** Many companies are expanding their holdings in real estate, infrastructure, private equity and emerging market assets, although moderately. In particular, some are considering entry into Chinese market as the country opens up its financial markets further and secures a greater presence in major global investment indices. We have not observed their liquidity conditions worsen, either from the cash flow or market liquidity perspective. In fact, they have doubled their cash holdings to about 2.3 percent of total assets in 2019 from 1.2 percent in 2014. However, given the volatile nature of such asset classes, Japanese lifers may need to consider building up sufficient liquidity buffers in case of massive market sell-offs, which could possibly impair their income streams and ability to dispose of those assets.

9. **Lifers have also adjusted their liabilities structure, which should also take into account their business strategy.** While fulfilling their legacy obligations with higher returns, Japanese lifers have managed to lower the guaranteed yields on new policies to around 0.25 percent from 2 percent in the late 1990s (Figure A3.2) and increase the share of variable-return products in their business mix. A welcome change to their liability management, such moves have presumably made savings-type products less attractive, notably in the shrinking share of their annuity business (Figure A3.7). Catering to a population largely accustomed to fixed-return insurance policies historically, Japan's life insurers need to strike a balance between controlling their liabilities and maintaining a customer base that will continue to generate revenues in the future.

10. **Aside from the risks and challenges they are tackling at the moment, yield-seeking Japanese insurers may continue to face mounting difficulties going forward.** With more than USD 2 trillion in foreign exposures, major Japanese financial institutions are a significant force in any market that still offer positive yields after accounting for the hedging cost (Figure A3.8). With their presence inevitably moving markets, particularly those that are relatively small or highly sought after, Japanese investors also face fierce competition from investors in markets with enormous savings and other institutions, for example hedge funds, which are also yield

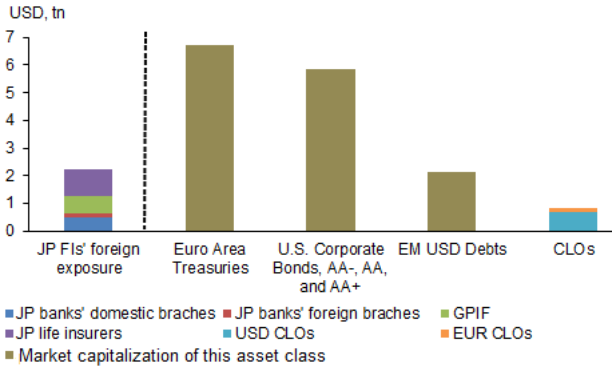
hungry and can move faster. As such, Japanese insurers may have to be constantly on the lookout for new and profitable investment opportunities and possibly venture into even riskier or more unfamiliar investment territories.

Figure A3.7 Premium Income by Product Type



Source: The Life Insurance Association of Japan

Figure A3.8 Foreign Exposure of Japanese banks, lifers and GPIF vs. Market Capitalization of Various Foreign Assets



Note: data as of September 2019, the market capitalization of CLOs are estimates. Calculation assumes that investment securities of JP banks' foreign branches are foreign currency denominated.
Source: Bank of Japan, The Life Insurance Association of Japan, Bloomberg Barclays, JPMorgan, Scope Ratings, and AMRO staff calculations.

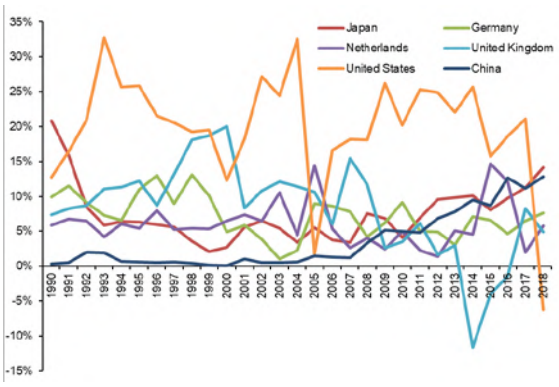
11. **It has become increasingly important for Japanese lifers to rely on an integrated risk management system to tackle the changing mix of risks.** As liquidity, credit and market risks are increasingly intertwined in their investment activities in the low interest environment, there is a need for Japanese lifers to constantly advance their practices in assessing and treating various risks in a coherent and inter-connected manner. In quantifying risks, they should consider incorporating as much market-based information as applicable in order to continuously enhance their early-warning systems for emerging risks. Such efforts would also complement their contagion risk analyses with market channels as they integrate further with the global financial community.

12. **Financial supervisors would need to constantly adjust their risk assessment priorities to take into account changes in insurers' business strategies and investment activities.** They should continue to ensure that lifers diversify their portfolios and take the appropriate level and combination of risks that are commensurate with their risk management capabilities. In particular, given that lifers have growing incentives to seek investment opportunities in less familiar markets, concentration in any particular asset class should be avoided, in order to refrain from suffering significant impairment to their balance sheets in the event of financial market stress.

Annex 4. Trends in Japan's Outward FDI[31]

1. **Japan became the world's biggest source of FDI in 2018.** In 1990, Japan accounted for more than 20 percent of global share, but the share dropped sharply to about 5 percent in 1993 as the economy entered into recession as a result of an asset price bubble collapse in Japan (Figure A4.1). Japan's share of global FDI outflows stayed well below that of other major western countries' share for about 20 years, and started to pick up only from around 2010. Its share of global FDI outflows reached 14 percent in 2018, making it the main source of FDI globally once again. While the U.S. is expected to recover from a temporary decline next year and China has increased its presence rapidly, Japan will continue to be one of the major sources of FDI given the recent trend. Although Japan is usually regarded as an export-oriented country with a strong manufacturing sector, the business model has been gradually shifting from exports to outward FDI. This selected issue aims to provide the background to such FDI outflow trends and the prospects of its sustainability.

Figure A4.1 FDI Outflow World Share



Source: UNCTAD

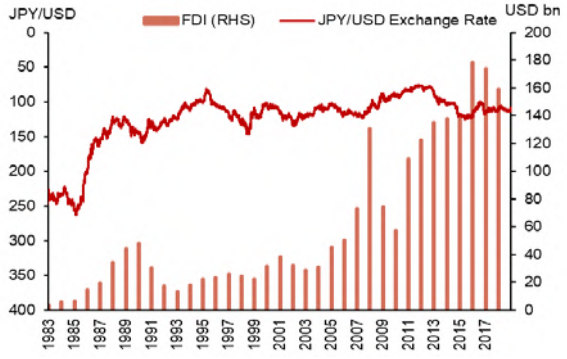
2. **From a long-term perspective, Japan's FDI outflow has been driven not only by exchange rate movements but also by financial performance of Japanese companies.** JPY appreciation was traditionally considered to be one of the biggest factors that drove Japanese companies to invest overseas. After the Plaza Accord of September 1985, the JPY was forced to appreciate substantially against the U.S. dollar from an average of 238 JPY/USD in 1985 to 138 JPY/USD in 1989 (Figure A4.2). In response to this JPY appreciation, Japanese companies shifted production overseas to lower cost countries in the region and FDI outflows increased to the highest level in the world. However, after the asset price bubble burst in 1990, FDI outflow stayed sluggish for a long period despite the fact that the exchange rate reached 81 JPY/USD in 1995. This is partly because Japanese companies were struggling to repay their debt amid the prolonged recession since the collapse of the asset price bubble (Figure A4.3). Japanese companies' profits fell after the bubble burst and showed a loss in 1998 and 2001. In line with the recovery and strong performance of Japanese companies since 2004, FDI outflows have increased again, although it dropped temporarily in 2008 due to the GFC.

3. **Japan's FDI has grown rapidly since 2011 to record highs notwithstanding JPY depreciation.** After the Great East Japan Earthquake in 2011, it was argued that Japanese companies needed to accelerate their overseas expansion due to a deteriorating domestic business environment – the so-called "Sextuple Whammy," which comprised the appreciation of the yen, a high corporate tax rate, strict labor regulations, demands for CO2 reduction, the

[31] Prepared by Takashi Yonemura (Associate Researcher).

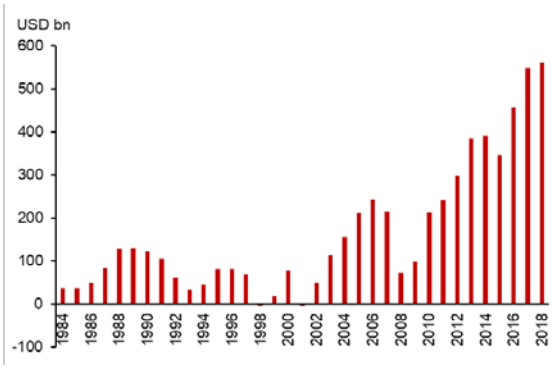
uncertainty over Trans-Pacific Partnership Agreement talks, and electric power supply shortages. JPY appreciation peaked in 2011 at 76 JPY/USD and since then, JPY has depreciated, but Japan's FDI outflows have continued to gather momentum.

Figure A4.2 FDI Outflow and Exchange Rate



Source: JMOF; BOJ; JETRO; Federal Reserve Board

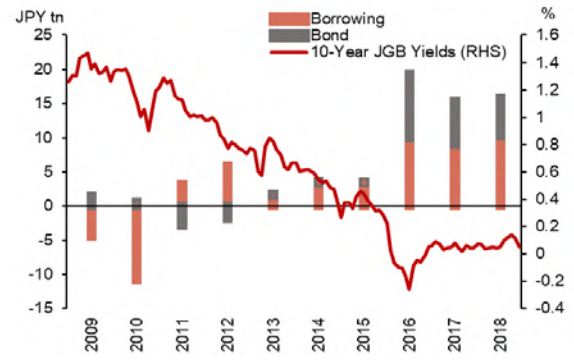
Figure A4.3 Japanese Companies' Profit Trend



Source: JMOF; Haver Analytics

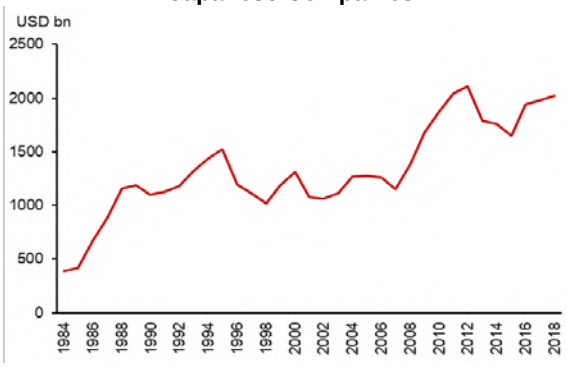
4. **Recent FDI outflows have been spurred by domestic factors such as shrinking domestic market, a low interest rate environment and corporate governance reform.** The population of Japan peaked in 2008 at 128 million, and has been declining since then. The shrinking domestic market has prompted many Japanese companies to seek markets and investment opportunities overseas, especially in countries with large and growing domestic markets. The overseas investments by the Japanese companies have been facilitated by cheap funding given the ultra-low interest rate environment since 2015 (Figure A4.4). While their debt-equity ratio remains low, some Japanese companies have used debt-financing for their investments (including FDI) to take advantage of low funding costs. Moreover, the pressure from shareholders for higher returns is rising on the back of recent regulatory reform on corporate governance. Although Japanese companies have been accumulating cash in recent years, they have been criticized for inefficient use of capital and have been pressured to make better use of the capital through avenues such as FDI (Figure A4.5).

Figure A4.4 Net Borrowing and Bond Issuance by Japanese Companies and 10-year JGB Yields



Source: JMOF; Haver Analytics

Figure A4.5 Accumulated Cash and Deposits in Japanese Companies



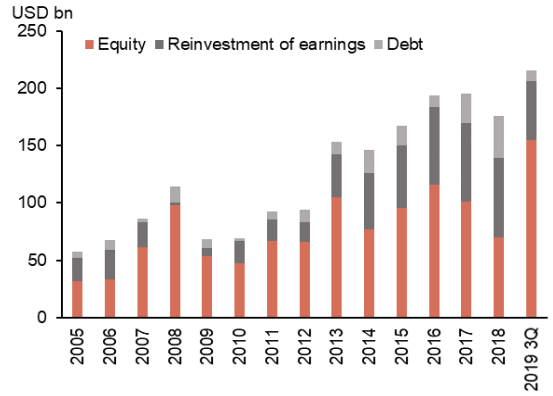
Source: JMOF; Haver Analytics

5. **Japan has been reinvesting its substantial earnings from FDI.** FDI outflows from Japan mainly take the form of (1) equity; (2) reinvestment of earnings; and (3) debt instruments. While equity, other than reinvestment, decreased from 72 percent of total FDI in 2011 to 40 percent in 2018, reinvestment of earnings increased from 21 percent to 39 percent over the

same period (Figure A4.6). This implies that the accumulated overseas investments by Japanese companies have resulted in a virtuous cycle, leading to continued expansion of FDI over the years. According to JETRO,[32] the rate of return on overseas investments by Japanese companies has been around 8 percent, higher than those of peer companies from major advanced economies globally. Although equity investments have declined slightly over the past two years, they are still substantial, driven by large scale M&As.

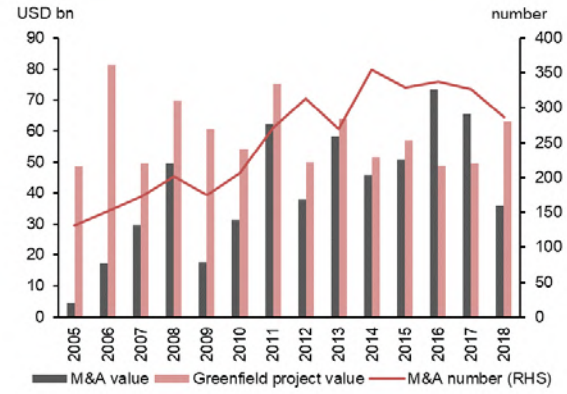
6. **Cross-border M&As have become a key driver of the increase in FDI, while the total value of FDI in greenfield projects has also remained high over the past decade.** The number of cross-border M&As by Japanese companies in 2017 has almost doubled from 2009 levels (Figure A4.7). Cross-border M&As are preferred by corporates for various reasons – a company may wish to acquire existing distribution channels or human resources or technologies in other companies that can create synergies with their own companies. Alternatively, it may be seeking to secure global market share or an established brand. Recent large M&As by Japanese companies have been mainly in consumer businesses, including food and beverages and financial services, which may be reflecting the diminishing opportunities in Japan (Table A4.1).

Figure A4.6 Japan's FDI Outflow by Type (2005-2019)



Source: UNCTAD; BOJ

Figure A4.7 Net Value of Cross-border M&As and Announced Greenfield FDI Projects by Japan



Source: UNCTAD

Table A4.1 10 Largest M&A Transactions by Japanese Companies (since 2005)

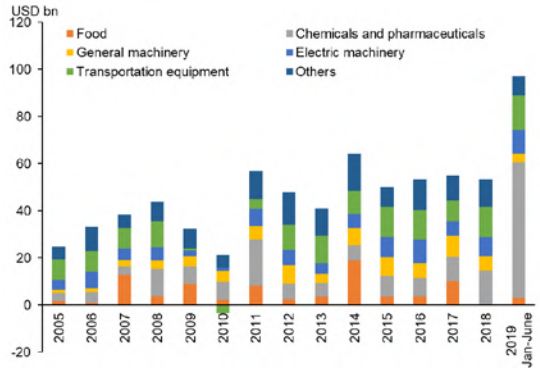
Year	Acquirer	Acquiree			Amount (USD mil)
		Name	Country	Sector	
2019	Takeda Pharmaceutical Co Ltd	Shire PLC	Ireland	Pharmaceutical	76,886
2016	Softbank Group Corp	ARM Holdings PLC	U.K.	Electronics	30,751
2013	SoftBank Corp	Sprint Nextel Corp	U.S.	Communication	21,640
2007	JTI Management Ltd	Gallaher Group PLC	U.K.	Tobacco	18,800
2014	Suntory Holdings Ltd	Beam Inc	U.S.	Food	15,688
2011	Takeda Pharmaceutical Co Ltd	Nycomed Intl Mgmt GmbH	Switzerland	Pharmaceutical	13,686
2019	Asahi Group Holdings	Carlton & United Breweries	Australia	Food	11,300
2008	Mahogany Acquisition Corp	Millennium Pharmaceuticals	Netherland	Pharmaceutical	8,128
2011	Mitsubishi UFJ financial Group	Morgan Stanley	U.S.	Bank	7,800
2017	Asahi Group Holdings Ltd	anheuser-busch inbev (Beer business in eastern Europe)	Czech Republic	Food	7,774

Source: JETRO; Various media reports

[32] JETRO (2019) "JETRO Global Trade and Investment Report 2019"

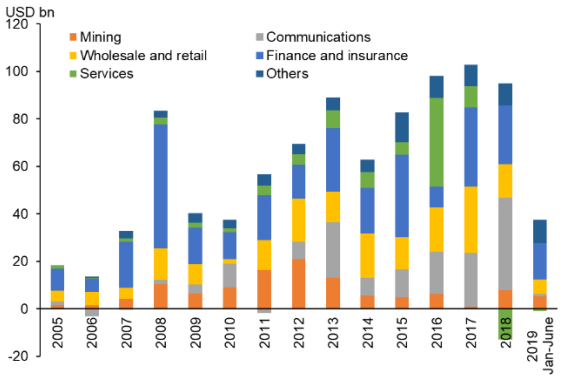
7. **Recent growth of FDI is led by the non-manufacturing sector.** The non-manufacturing sector has outperformed the manufacturing sector in terms of FDI outflows since 2011 (Figure A4.8 and A4.9). FDI outflows in both sectors were underpinned by M&As. In the manufacturing sector, the focus was on chemicals, pharmaceuticals and food, while in the non-manufacturing sector, the focus was on communications, finance and insurance. Overall, FDI in the manufacturing sector has been relatively stable at around USD60 billion per annum since 2011. According to Japan Bank for International Cooperation (JBIC),[33] the overseas production ratio[34] in the manufacturing sector reached about 35 percent in 2013 and has remained at that level since. Meanwhile, the ratio of companies aiming to expand domestic businesses in the manufacturing sector has increased from about 30 percent in 2013 to 43 percent in 2019, because there was a focus on renewal of equipment and R&D investments to strengthen the domestic production capacity to produce high value-added goods. On the other hand, FDI in the non-manufacturing sector has grown from around USD60 billion in 2011 to USD100 billion in 2018. This is mainly because domestic-oriented companies, including communications, retail and finance services, have expanded their overseas businesses substantially on account of the shrinking domestic market.

Figure A4.8 FDI – Manufacturing Sector



Source: JMOF; BOJ; JETRO

Figure A4.9 FDI – Non-manufacturing Sector



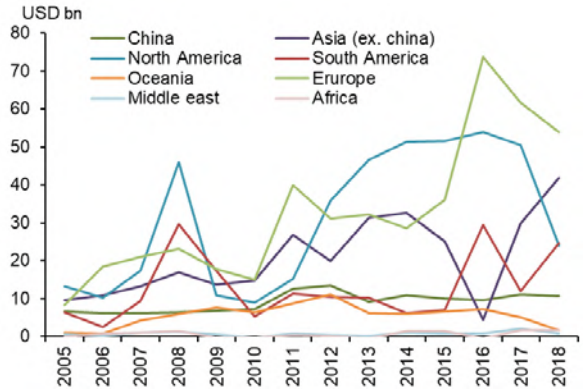
Source: JMOF; BOJ; JETRO

8. **A large portion of Japan's FDI outflow has headed to North America and Europe, while Asia's share has increased gradually** (Figure A4.10). This is mostly driven by Japanese companies' search for M&A opportunities in companies with stable cash flows, strong brand recognition and access to large, growing markets. The attractiveness of these regions as R&D bases is another factor in their prominence. On the other hand, the FDI outflows to Asia have also increased steadily, except in 2016, when there was a significant outflow from Singapore.[35] Although Asia has been an important destination for Japanese companies that have sought to take advantage of low labor costs, the shift toward Asia has accelerated recently due to the "China plus one" strategy. This allowed diversification of the production line to mitigate risks arising from China. In addition, another reason for their renewed focus on Asia is to compensate for a shrinking domestic market.

[33] JBIC (2019) "Survey Report on Overseas Business Operations by Japanese Manufacturing Companies"
[34] Overseas Production Ratio = (Overseas Production) / (Domestic Production + Overseas Production)
[35] SoftBank Group Corp received the dividend of JPY 2,373 billion in 2016 from its subsidiary in Singapore.

9. **Although the strong FDI outflow trend will likely continue, there will be risks and challenges in such investments.** The aging population and the shrinking of the domestic market is a long-term trend in Japan that will drive Japanese companies to invest abroad. In addition, Japanese companies are investing abroad to seek higher returns. Given these factors, FDI outflows are expected to remain strong going forward. However, some overseas investments have resulted in large losses, due in part to a harsher-than-expected business environment and in part to insufficient business planning. In light of the challenges confronting the global economy, Japanese companies need to be strategic in their investment decisions, so that they can maximize their long-term profitability.

Figure A4.10 Foreign Direct Investment, by Region



Source: JMOF; BOJ; JETRO