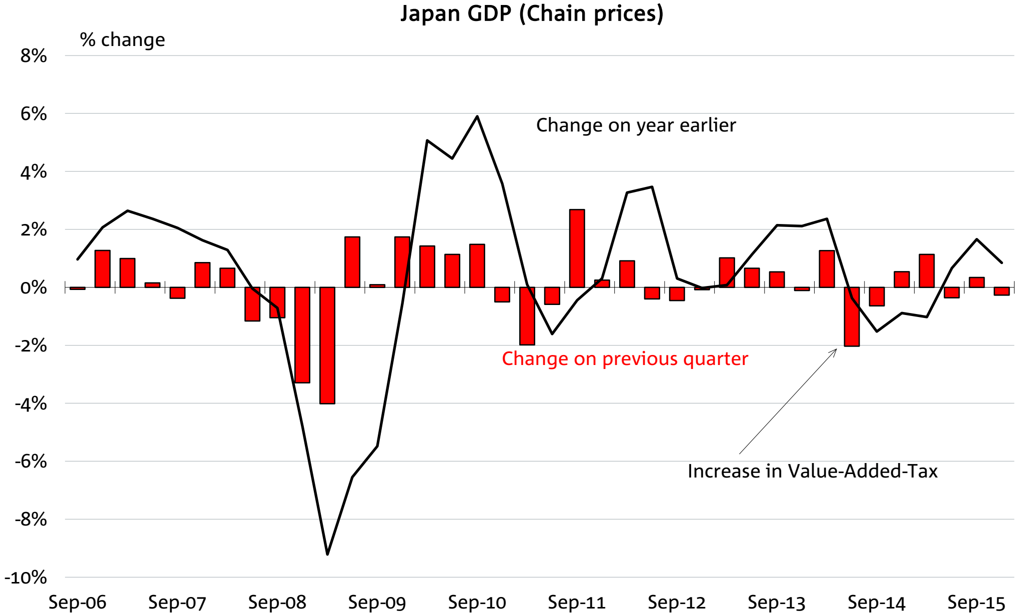
Japan
Economic Outlook

Japan Economic Outlook, March 2016: Key points

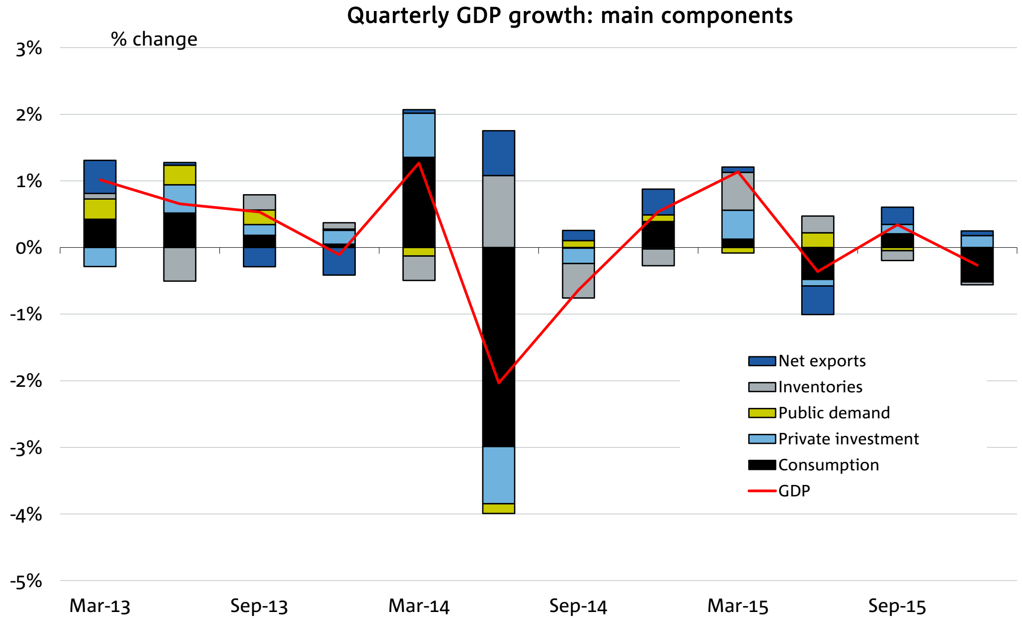
- Overall the picture is of an economy struggling to generate any momentum.
- Japanese GDP declined by -0.3% qoq in the December quarter 2015, although compared to the same quarter a year ago, growth was a more respectable 0.8% (s.a.). Business surveys are generally consistent with an economy growing at a modest pace (remembering that 'modest' for Japan is slow by the standard of most countries), although the recent falls in the manufacturing PMI are a concern.
- Consumption has been weak given the strength in employment, generally solid consumer confidence and low inflation due to falling commodity prices. This suggests some upside ahead, but the fall in consumer confidence in February is a concern.
- Business investment continues to trend up, but exporters are struggling in the face of global economy weakness and, more recently, Yen appreciation. A support for business investment has come from corporate profits, which rose by 7.5% in 2015 to a record ¥70.8 trillion, although they started to turn down at the end of 2015.
- The main bright spot is the labour market. Labour market conditions remain tight, with the unemployment rate at a low 3.3%. Nominal cash earnings, though, have only increased modestly. The outlook is for modest increases in wages, as corporations such as Toyota have pared back their wage increases from those of recent years.
- Progress towards the Bank of Japan's (BOJ's) inflation target has stalled, and inflation is unlikely to reach the BOJ's 2% inflation target under current policy settings. Given this, the lack of economic momentum, recent Yen appreciation and falls in equity values since mid-2015, we expect the Bank of Japan to decide on a significant monetary easing at its April 2016 meeting. This will likely include expanded QE, a further cut to deposit rates and something akin to the ECB's financing programs for banks, which allows banks to access funding at a rate as low as the negative deposit rate.
- At the same time, the budget deficit is set to fall again in calendar 2016, suggesting fiscal policy remains a headwind, although by no more than in recent years. However, there are reports that the Government is considering fiscal stimulus measures, possibly to be announced ahead of the late May G7 summit.
- Japan's current account surplus surged to ¥16.64 trillion in 2015, driven by record tourist arrivals, weak crude prices and earnings from overseas investments.
- Japan's very strong external position has cemented its safe haven status, resulting in the sharp recent appreciation in the Yen – despite the negative interest rate policy.
- The stronger currency has weakened Japan's equity markets, with the Nikkei 225 declining close to 20% since its peak. The launch of the BOJ's negative interest rate policy has elevated volatility in the Japanese Government bond market.

National Australia Bank

GDP declined at the end of 2015 as economy struggles to gain momentum



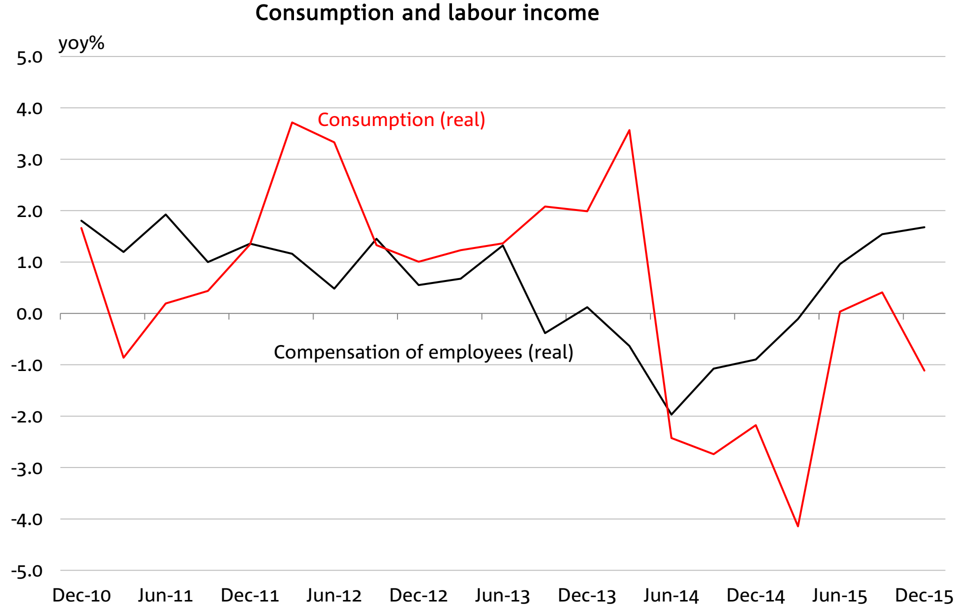
Sources: Thomson Reuters Datastream. Change on year earlier calculated using seasonally adjusted data.



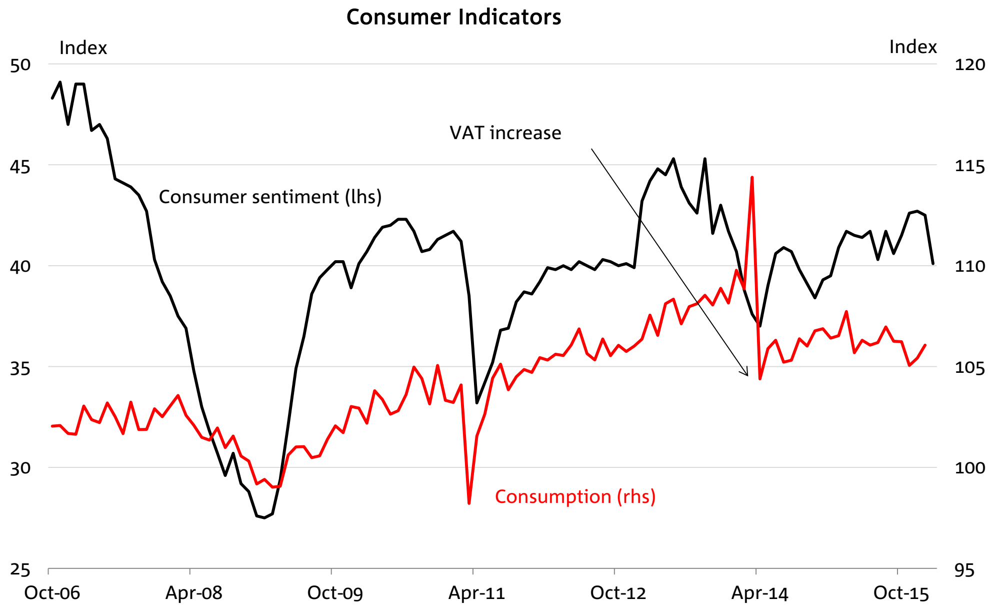
Sources: Thomson Reuters Datastream (note: residual component not shown)

- Japanese GDP declined by -0.3% qoq in the December quarter 2015 and two out of the last three quarters have been negative.
- However, growth over the year to the December quarter, at 0.8% (s.a.) shows a more positive picture. This may seem low, but Japan's growth rate needs to be seen in the context of its declining population and, as is being experienced by other countries, a weakening in productivity growth. The Bank of Japan estimates that the economy's potential growth is '0.5% or lower', well below that of Australia or the United States.
- The decline in December quarter GDP mainly reflected a fall in private consumption. While 'net exports' in a mechanical sense made a positive contribution to growth, it was hardly a good news story as there was a fall in export volumes which was eclipsed by even greater falls in imports. Both exports and imports fell over the course of 2015, an indicator of weak external and domestic demand.
- Public demand was down a little in the quarter, as it was in the September quarter.
- On a more positive note, fixed capital investment rose for the second consecutive quarter, reflecting an increase in business investment (1.5% qoq) as there was a decline in public investment. Residential investment also declined in the quarter (-1.2% qoq) although it was still higher than it was at the same time a year ago.
- Overall, the data point to an economy struggling to generate any momentum.

The consumer goes missing



Sources: Thomson Reuters Datastream, NAB

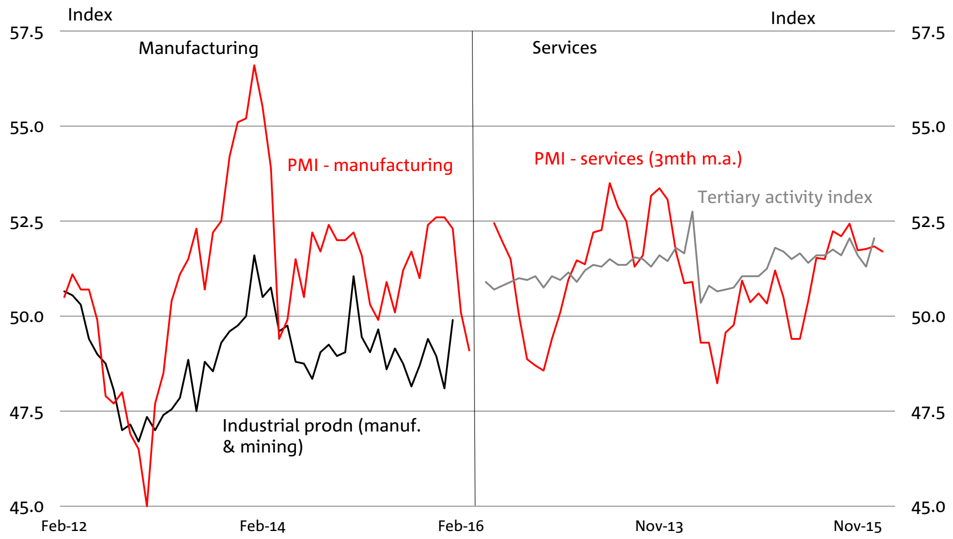


Source: Thomson Reuters Datastream

- While the downshift in the level of consumption following the April 2014 VAT increase was not a surprise – the VAT represented a permanent shift of income out of the household sector – the weakness in subsequent growth is, particularly over 2015.
- While average wages growth remains subdued (albeit reasonable by Japanese standards), gains in employment have supported labour earnings. Moreover, inflation has been weak in part reflecting the fall in oil prices; over the year to January the CPI was flat.
- Moreover, starting mid-2014, consumer sentiment started to trend up. Consumer's views on living standards, income growth and also on whether it was a good time to purchase durable goods all trended up.
- Wealth effects have been a negative, at least since the middle of 2015. The stock market – which had been growing strongly since late 2012 – peaked in early June and has since lost about 20% (to February). However, the weakness in consumption occurred ahead of this. Moreover, while residential property prices also fell over the year to 1 January 2016 by 0.2% the fall was the smallest in eight years.
- Overall, this suggests that there is potential upside to consumer spending. Indeed, the Cabinet Office's measure of private consumption has increased over the two months to January. However, the large dip in consumer confidence in February raises some doubt as to how sustainable this will be.

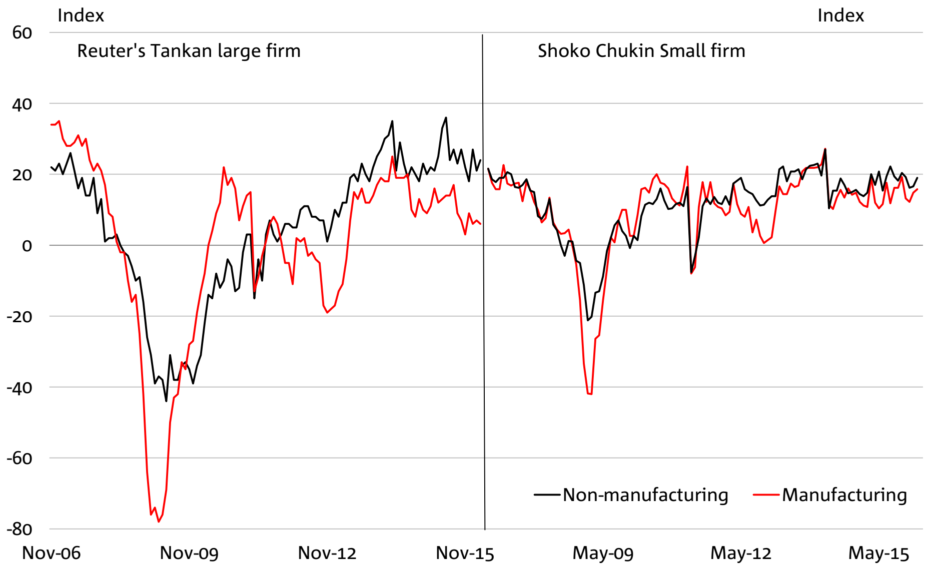
Business surveys generally OK, although sharp fall in manufacturing PMI a concern

Business conditions - PMI, IP, Tertiary activity



Source: Thomson Reuters Datastream. Note the IP and Tertiary activity indices have been divided by two.

Business conditions

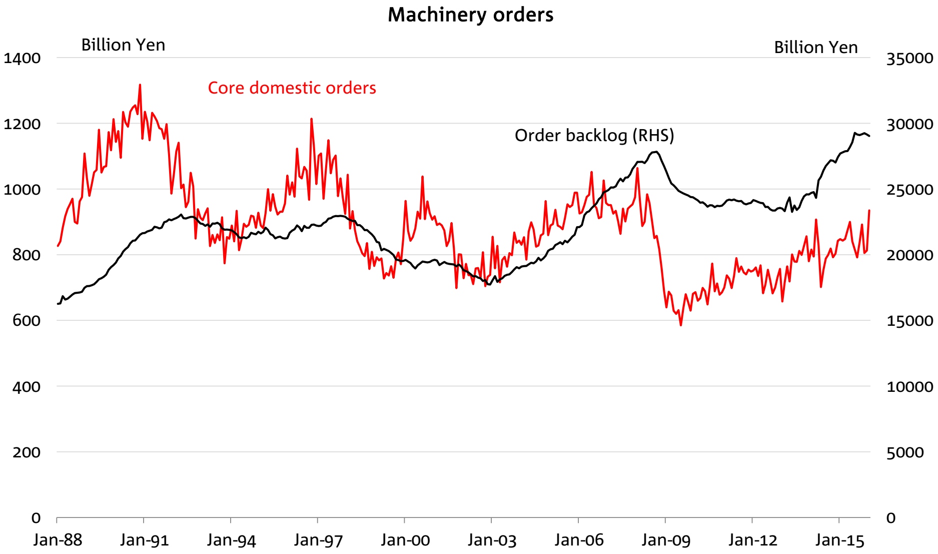


Source: Thomson Reuters Datastream

- Business surveys have generally been consistent with an economy growing at a modest pace (remembering that 'modest' for Japan is slow by the standard of most countries), particularly in the services sector.
- The PMI for manufacturing has however, turned down sharply in February, and the 'flash' estimate for March has it moving below 50 (a reading of below 50 indicates a net balance of respondents are seeing conditions deteriorate). While industrial production picked up in January, businesses' are expecting that this will fall back in February.
- Moreover, the Reuter's Tankan large firm manufacturing index has been falling since August 2015. This measure arguably aligns better with profit growth than production and since August the Yen has been appreciating (see page 13) affecting the profitability of overseas operations. Moreover, manufacturers, more so than service sector firms, are exposed to the current weakness in the global economy.
- In contrast, small manufacturers are doing better according to the Shoko Chukin survey (while below 50 they are tracking at solid levels by the historical standards of this survey)
- The service sector PMI, while it has come off a little, is tracking at solid levels. In line with the PMI, the tertiary activity index has been trending up since the fall-off post the April 2014 VAT increase, although progress over the last year has been slower. Similarly, the Reuter's Tankan large firm and Shoko Chukin small firm non-manufacturing readings are at solid levels.

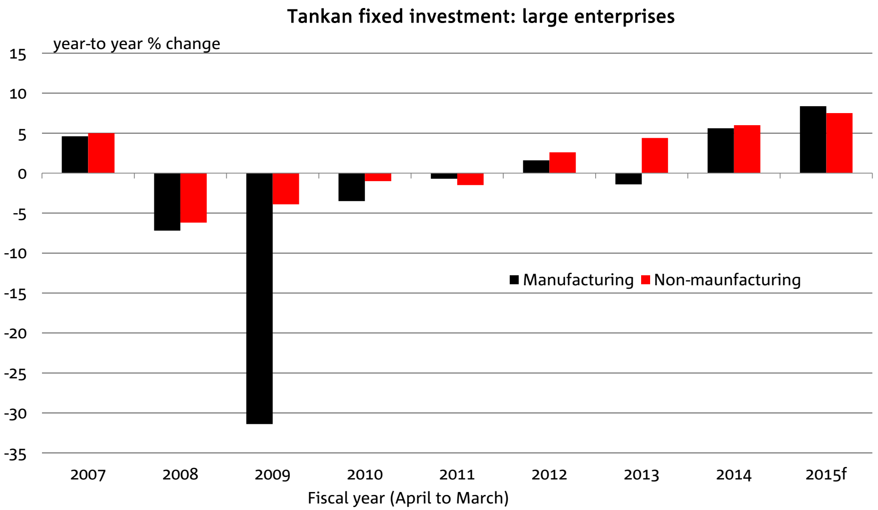
National Australia Bank

Investment trending upwards but exports are under pressure

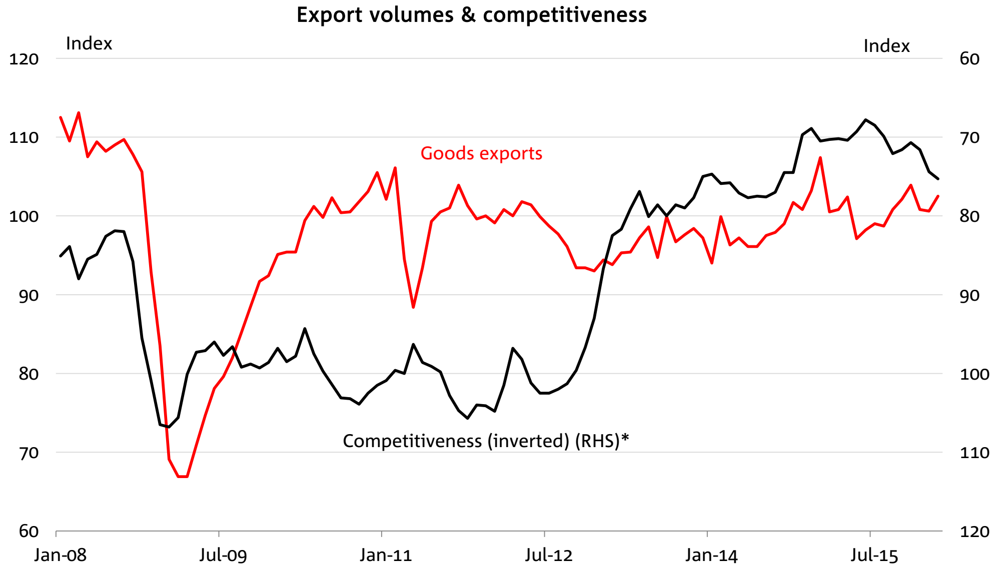


Source: Thomson Reuters Datastream. Core excludes utilities & ships

- Consistent with the increase in business investment recorded in the National Accounts in the second half of 2015, partial indicators of business investment have trended upwards, albeit only slowly given the strong increase in corporate profits (see page 7).
- The core machinery orders data are very volatile making discerning a trend difficult, but after a correction following the April 2014 VAT, orders have resumed their uptrend. The backlog of orders has also risen, with the BOJ reporting that this backlog is concentrated in items with a long lead time – suggesting a strong pipeline (barring a rush of cancellations in the event of a major change to the outlook). The quarterly Tankan survey has also shown a steady improvement in fixed investment in recent years.
- In contrast, the volume of goods and services exports fell over 2015. The monthly real export indicator moved up in February, but the average for the quarter to-date remains below the December quarter average. Japanese exporters are battling a weak global economy (particularly in their key Asian markets). Since August the Japanese Yen has appreciated, adding to their difficulties.



Sources: Thomson Reuters Datastream, Bank of Japan, NAB. 2015 forecast based on December '15 survey forecasts plus the average difference between December survey and actual outcomes in last four years.



Source: Thomson Reuters Datastream. * Measured by real effective exchange rate; a lower number indicates improved competitiveness

Corporate profits growing solidly – despite lacklustre sales growth

- Japanese corporations earned a record ¥70.8 trillion of profits in 2015, according to the *Financial Statements of Corporations* from the Finance Ministry. This represented a 7.5% yoy increase. There was a slight easing (-1.7%yoy) in the 4th quarter, albeit at a high level.

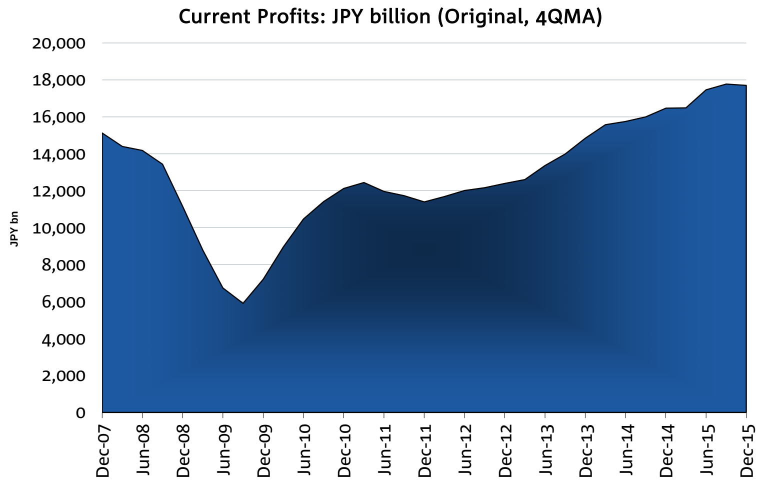
- The increase in profits was not matched by a commensurate rise in sales. Sales fell by -2.7% yoy during the December quarter, and by -0.5% yoy over 2015 as a whole. The rise in profits resulted from lower cost of sales (-3.9% yoy to the December quarter) and, more significantly, lower interest expenses (-7.8% yoy to the December quarter). Lower interest rates, a weaker currency and falling crude oil prices are among the factors that have likely contributed to the improved profit outcomes.

- Liquidity conditions improved, with the ratio of cash, deposits and securities to annualised sales rising to 14.4 in the December quarter, up from 14.2 in June. Further, Japanese corporations have vast swathes of cash holdings, as high as ¥247 trillion, according to the BOJ.

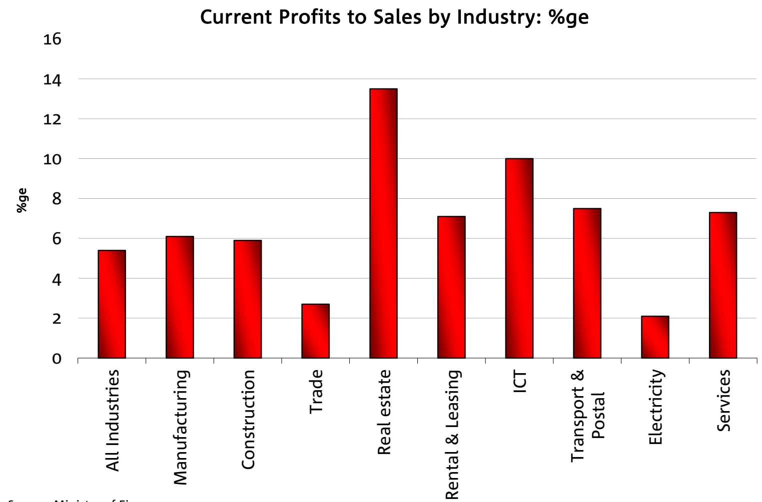
- Further, short term borrowing declined by -2.5%, although long-term borrowings grew by 3.6%. This could be due to Japanese corporations availing of lower interest rates as a result of the BOJ's QQE program. This trend will likely gain traction, as BOJ has embarked on its negative interest rate program.

- Turning to outcomes by industry, Real Estate (13.5%) is the standout in terms of the ratio of profits to sales. Real estate is likely to be a key beneficiary of the lower interest rates. Other sectors to record solid profitability include: Information and communications technology (10%), transport (7.5%) and services (7.3%). Trade (2.7%) and electricity (2.1%) were somewhat less profitable than the other sectors.

- With the JPY expected to hover between 110 and 118 to the USD, (c.f. ~121 JPY/USD in 2015), there will likely be pressure on earnings of exporters. Conversely, lower interest rates will help attenuate the impact of weaker profits.



Source: Ministry of Finance

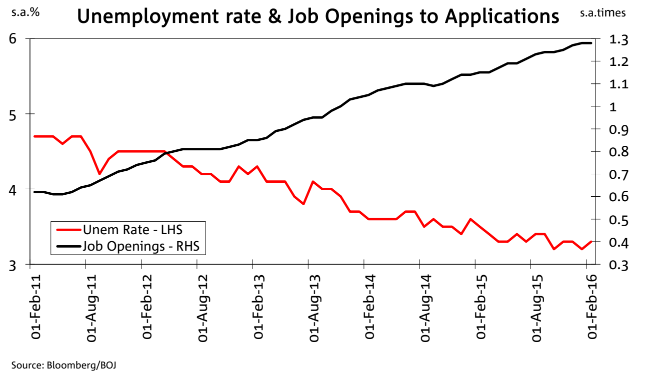


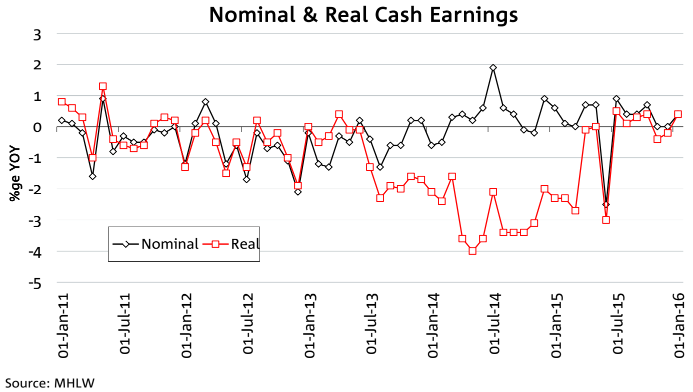
Source: Ministry of Finance

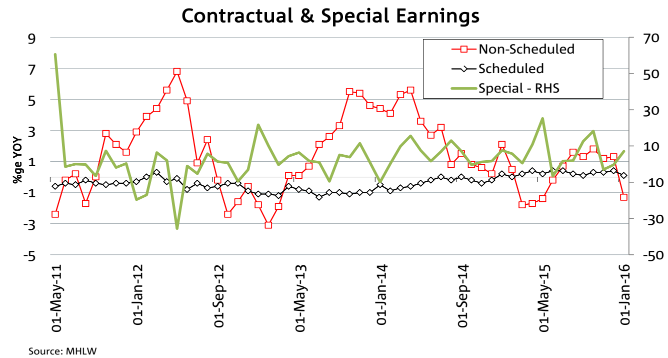
National Australia Bank

Labour market – Unemployment low, but wage growth modest

- Labour market conditions remain tight, with the unemployment rate at a low of 3.3%, based on February, 2016 data. Further, the ratio of *job openings to applications* is at a high 1.28, indicating strong demand for labour relative to the available supply.
- However, this strength has not directly translated into earnings. Nominal cash earnings have increased by 0.1% over the year to January 2016, whilst real cash earnings rose by 0.4%, the first positive increase since October, 2015.
- In terms of nominal earnings, contractual earnings only recorded a modest rise. Scheduled earnings (which includes base pay) rose by 0.1%, while non-scheduled earnings (overtime pay) contracted by -1.3%. The somewhat weaker non-scheduled earnings can be explained partly by the hours worked data: total hours worked declined by -0.8%.
- Total cash earnings were raised somewhat by special cash earnings. This category includes bonus payments. Special cash earnings rose by 7.1% over the year to January 2016, helping dampen the impact of the contraction in non-scheduled payments.
- According to data from the MHLW (Ministry of Health, labour and Welfare), total cash earnings for retail and wholesale trade (1.7%) were stronger than other sectors such as medical, health and welfare (-1%). These results could possibly result from impact of strong tourism demand, which translates to stronger labour demand and higher pay.
- Further, analysis from the BOJ indicates an improvement in hourly cash earnings of part time employees, and these broadly reflect a response to tightening labour market conditions. Part time employee earnings have accelerated to slightly below 2% on a yoy basis, supported, in part, by an increase in the minimum wage.
- Looking ahead, the outlook for wage increases remain modest, and are likely to fall short of expectations of both the BOJ and the Government. Toyota Motor Corporation and its labour union agreed for a ¥1,500 monthly increase in wages, half of what the union was demanding and significantly lower than the ¥4,000 agreed upon last year. A similar amount was agreed by electronics firms' Hitachi and Panasonic, half the amount agreed upon in 2015. Finally, workers at the country's megabanks – Sumitomo Mitsui, Mizuho and Bank of Tokyo-Mitsubishi UFJ - decided not to request a wage rise due to the expectation of lower profits stemming from the BOJ's Negative interest rate policy.
- The outcome of wage negotiations thus far indicate that achieving the 2% inflation target will be a significant challenge.



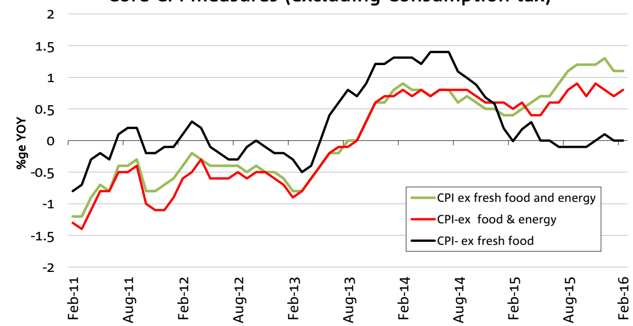




With progress towards its inflation target stalling, the BOJ is set to ease further

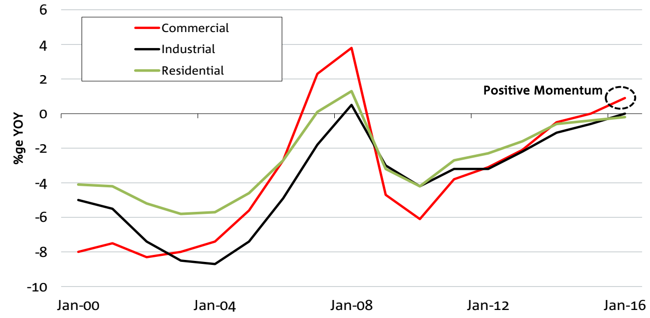
- At its March meeting, the BOJ decided to continue purchasing JGB's (Japanese Government bonds) so as to maintain the ¥80 trillion annual pace of expansion in the money base. They also committed to purchasing ETFs, Commercial Paper, Corporate bonds, J-REITS. Finally, the BOJ continued with the -0.1% deposit policy which came into effect on the 16th of February, 2016.
- To limit the impact on financial institutions the negative interest policy rate is only applied to a portion of banks' reserves at the BOJ. Bank reserves are split into 3 tiers: The first tier, worth around ¥210 trillion (basic balance) earns a 0.1% interest; the second tier worth about ¥40 trillion (macro add-on balance) earns 0% interest, and expand at a rate of ¥80 trillion per year; and finally the -0.1% interest rate (policy rate balance) will apply to around ¥10 trillion worth of reserves.
- The BOJ launched the negative interest rate policy to accelerate activity and boosting inflation. While the BoJ has made some headway towards lifting inflation back towards 2%, progress has stalled. In part due to falling energy prices, inflation is subdued, with headline CPI up a weak 0.3% yoy to February, 2016. Core inflation - excluding volatile fresh food and energy prices - (the BOJ's preferred measure) has stalled at just over 1% yoy since August 2015, well short of the BOJ's 2% target. On a more positive note, land prices rose over the year (to 1 January 2016), for the first time in eight years. Commercial property led the way, rising by 0.9% yoy.
- Inflation expectations are also weakening. Breakeven inflation rates indicate medium term inflation expectations have fallen to around 0.4%, well below the BOJ's measure. Other measures of inflation expectations are higher, but have also weakened recently, and wages remains muted.
- Looking ahead, we expect further easing by the BOJ. Economic data are pointing to a lack of momentum, the Yen has been appreciating, and equities are well off their mid-2015 peak. Moreover, it is very difficult to see the BOJ reaching its inflation target any time soon. To illustrate this we have used an inflation model which incorporates the output gap (based on the unemployment rate), the currency, oil prices, and past growth in the CPI (i.e. backward looking inflation expectations), and the value-added-tax (VAT) rate. Based on our current forecasts for the economy, which include some modest Yen depreciation through to 2018, as well as a gradual rise in oil prices, headline inflation will fall short of the BOJ's target and price growth ex food and energy is even lower. (Note this makes no allowance for the scheduled VAT increase in 2017 as no final decision has been made and, even if it were to go ahead, would only temporarily boost inflation.)
- All this adds up to the likelihood that the BOJ will need to ease policy again soon. We expect that they will announce a major easing at the April meeting, in order to restore confidence in the outlook. This is likely to include a combination of measures: additional asset purchases or 'QE' (taking the annual targeted increase in the money base from ¥80 trillion up to ¥100 trillion across a range of assets), a further cut to the deposit rate (taking the Policy Rate Balance to -0.2%), and something akin to the ECB's financing programs for banks, which allows banks to access funding at a rate as low as the negative deposit rate. While this provide stimulus to the economy, given the size of the task to get inflation consistently back to around the 2% mark, further easing will be required down the track – probably in the final quarter of 2016.

Core CPI measures (excluding Consumption tax)



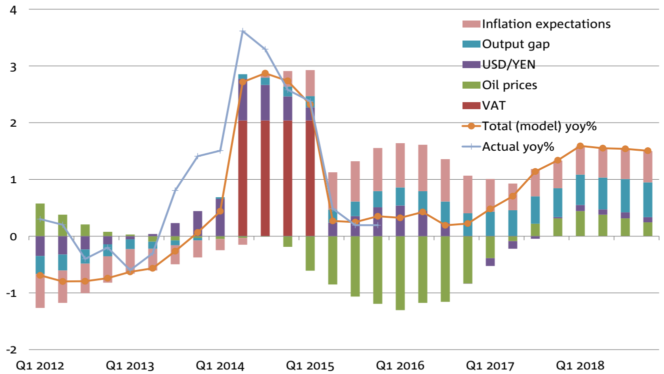
Source: Statistics Japan

Land Prices



Source: Ministry of Land

Inflation outlook and contributing factors

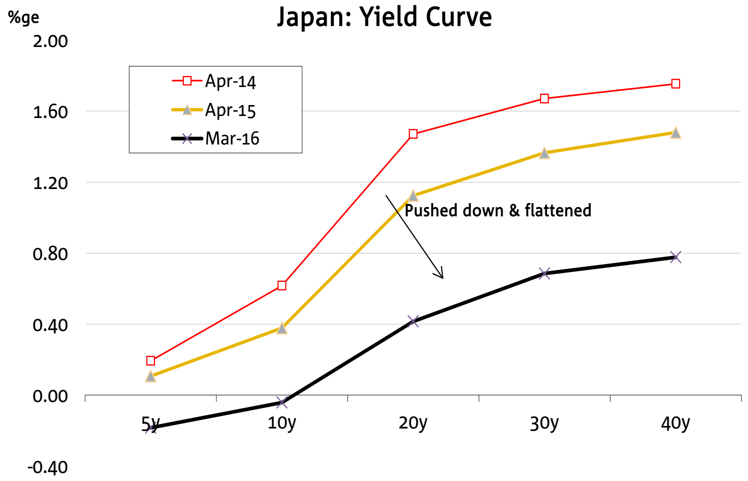


Sources: ThomsonReuters Datastream, Econdata DX, NAB

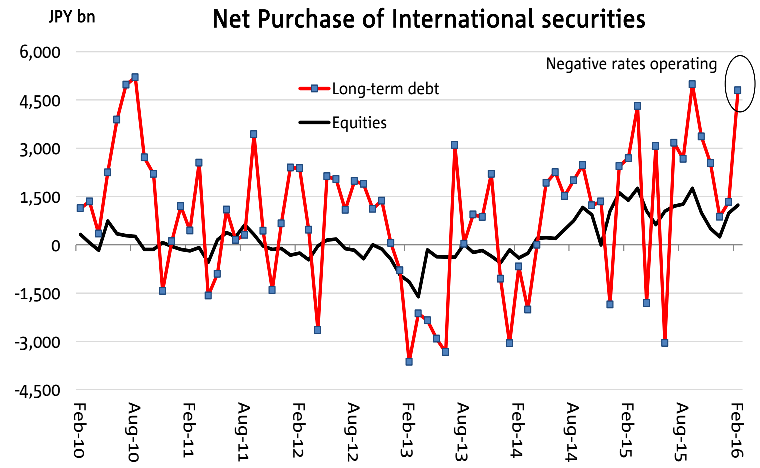
National Australia Bank

Negative interest rate implications

- The launch of negative interest rate has witnessed both a downward shift and flattening of the yield curve, with the benchmark 10-year JGBs falling into negative territory.
- This has, in turn, lowered borrowing costs for the Japanese Government, as well as households and businesses. Average contracted rates on new loans and discounts fell from 0.927% (p.a.) to 0.806% - according to BOJ.
- Negative rates lower borrowing costs, but do come with potential side effects.
- However, this is eroding profits from Japanese banks. Banks typically borrow at the short end of the yield curve and invest in longer-term JGBs. A flatter yield will limit this source of revenue. This might compel banks to invest in longer-term securities, or seek alternative (and potentially risky) sources of investments.
- According to analysis from CLSA, a brokerage, Japan Post Bank and other domestically focussed regional banks are likely to be more affected by negative interest rates than the larger, globalised Japanese banks. Standard and Poor's estimates that operating profits at major Japanese banks could be 8% lower; regional banks could experience a 15% decline.
- The volume of cash in circulation grew by 6.7% over the year to February 2016, according to BOJ data, the quickest since February 2003. According to the *Nikkei* publication, ¥10,000 notes are the most popular denomination. There has also been anecdotal evidence of increasing consumer demand for safes and home security, as demand for cash holdings rise – potentially depriving banks of funds.
- Consumers are also showing increasing interest in the '*tomonokai*' loyalty clubs of department stores such as Mitsukoshi, Daimaru and Takashimaya. They offer account holders annual bonuses between 5-8% in annual bonuses, a very attractive return relative to bank and bond deposits. Besides department stores, construction and real estate could also benefit from the low interest rate environment.
- A number of Japanese corporations are taking advantage of the lower rates by issuing long term debt at record low yields. West Japan Railway became the first corporation to issue 40-year bonds. Food and pharmaceutical manufacturer, Ajinomoto, witnessed very strong demand for its 20-year bonds at a yield of 0.939%.
- The BOJ has exempted Money reserve funds (MRFs) from negative interest rates. These are funds that brokers use to invest clients' cash during times of equity market turbulence. The aim of the policy was not to dissuade Japanese investors from investing in equities.
- February 2016 (the first full month since negative rates were introduced), witnessed strong demand for international securities, particularly long-term debt. Life insurance corporations were major buyers of international debt securities, according to Finance Ministry data. Negative rates have raised concerns about the ability of insurance companies meeting their pension liabilities.
- NAB Economics has prepared a comprehensive analysis on negative rates. It can be found here.

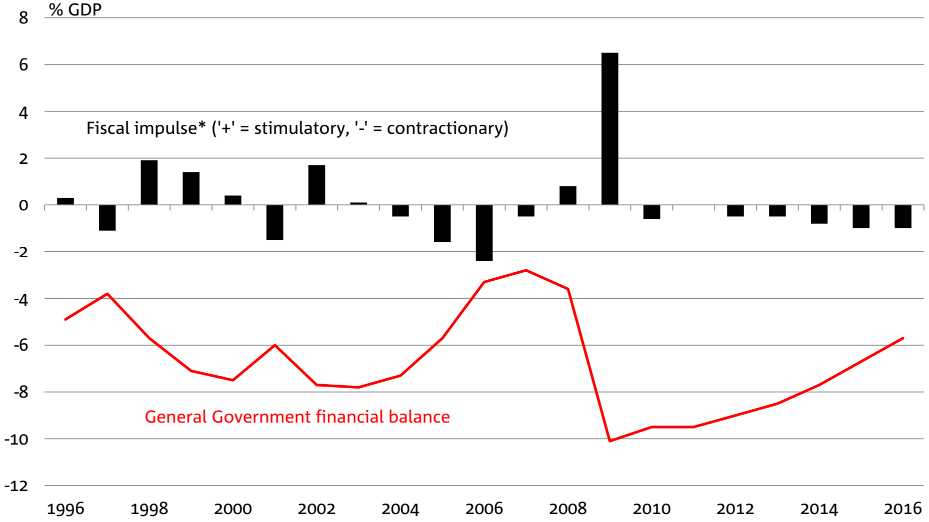


Source: Bloomberg

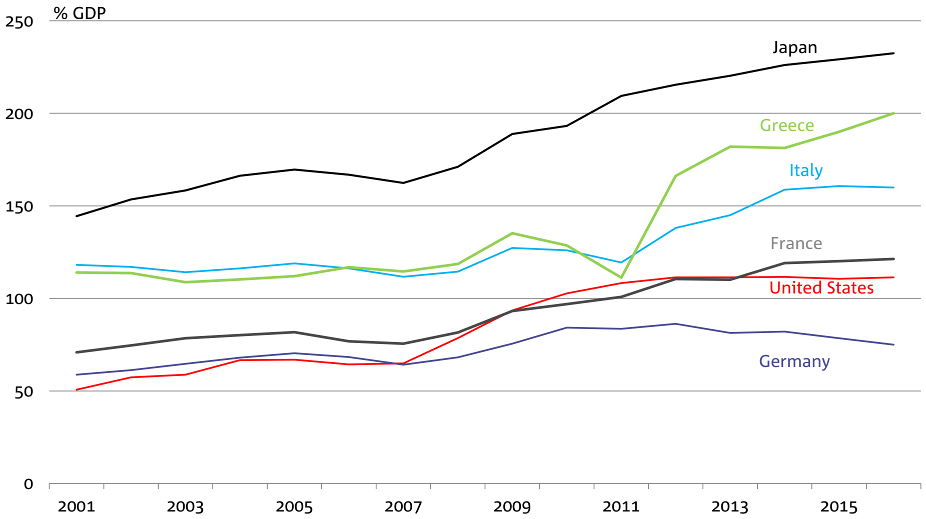


Ministry of Finance- Japan

Fiscal policy – at a turning point?



Sources: Ministry of Finance, NAB. * Calculated as -(change in general govt. financial balance from previous year)



Sources: Ministry of Finance (OECD)

- In January, the Japanese parliament passed a ¥3.5 trillion supplementary budget for fy2015, and the initial Budget for fy2016 was passed this week. However, this does not mean that Japan's fiscal policy has turned expansionary; higher tax revenues are a major source of finance for the extra expenditure and supplementary budgets are a regular event (one of a similar size was passed the previous year).

- Indeed, the budget deficit is set to fall again in calendar 2016, suggesting fiscal policy remains a headwind, although by no more than in recent years.

- That said, if the economy were to weaken, fiscal policy could become more stimulatory. Indeed, recent press reports suggest that the Government is considering fiscal stimulus measures. Some press reports have indicated that this could include a delay to the scheduled April 2017 increase in the Value Added Tax (VAT) although the Prime Minister has stated that it will go ahead unless there a major shock (such as another GFC). The reports indicate that a decision is likely to be made ahead of the G7 summit, being hosted by Japan, in late May 2016.

- Against this, the Government has a target of achieving a primary surplus by FY2020. But not even the most optimistic projections suggest that the target will be achieved on current policy settings. History suggests that in the event of a downturn, the target will be sacrificed (or delayed) and stimulus measures introduced, so additional measures would not be a surprise given the lack of momentum in the economy.

- While the budget deficit is falling, it remains higher than growth in nominal GDP. As a result Japan's government debt to GDP ratio, which is already high by international standards (particularly on a gross debt basis), is likely to continue rising.

Current account surges to a recent high…

- Japan's current account surplus surged to ¥16.64 trillion in 2015 (3.3% of GDP), the strongest outcome since 2010. The goods account improved by ¥11.3 trillion (to -¥643.4bn), driven largely by falling crude prices. Overall, imports fell by 10.3%, while exports increased by 1.5%.

- The services deficit virtually halved to -¥1.56 trillion. There was a discernible improvement in the travel balance, rising from a -¥44.1bn deficit in 2014 to a ¥1,121.7bn surplus in 2015. There were 19.7 million international tourists visiting Japan in 2015, a 47.1% increase on 2014. There was a particularly strong influx of Chinese tourists, with Chinese tourist numbers rising by 107% during 2015. A weakening yen, easier visa rules and measures such as tax-free shopping have bolstered foreign visitor arrivals to Japan.

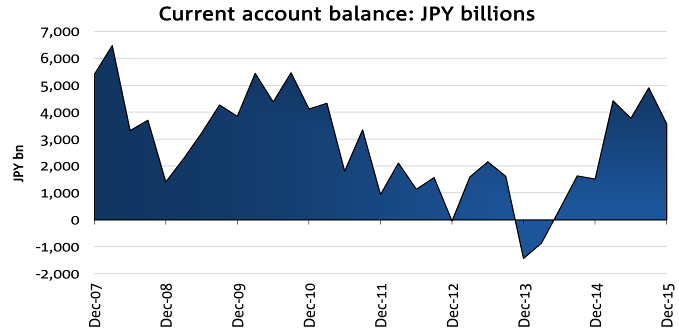
- Government data indicates that hotel stays by foreign visitors surged 48.1% to 66.37 million in 2015, a record outcome. Tokyo, Osaka and Hokkaido were among the most popular destinations for foreign visitors. Besides, Kyoto and Okinawa also experienced witnessed strong demand for accommodation and other services.

- The Japanese Government is aiming for 20 million international tourists by 2020, the year that Tokyo is holding the Olympic Games. It appears that they will reach the target before that, if current trends continue.

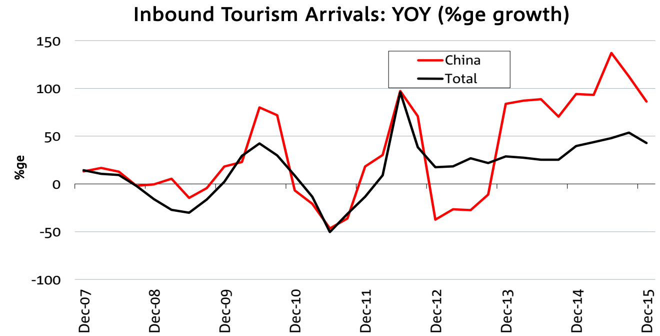
- Both goods and services, despite notable improvements, recorded modest deficits. The segment in which Japan has performed very strongly over a number of years in the Primary income balance, and it represents earnings from overseas Japanese investments. Earnings from this category amounted to ¥20.7 trillion in 2015, a 15% improvement on 2014's level.

- Japan's strong earnings from overseas is also reflected in its net international investment position, which basically is a measure of net foreign assets. Japan's net international investment position is 70% of nominal GDP, a very strong figure.

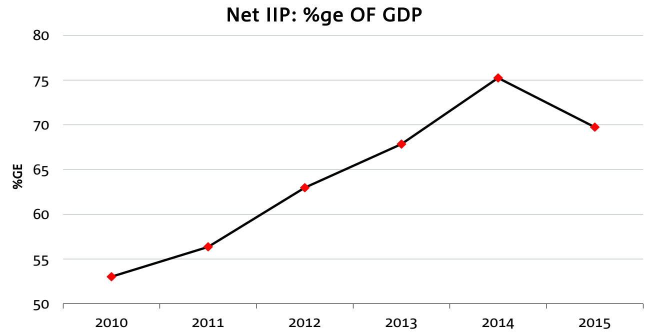
- In summary, the Current account and Net IIP indicate a very healthy external position. However, a strong current account creates upward pressure on the Japanese Yen.



Source:EconData DX



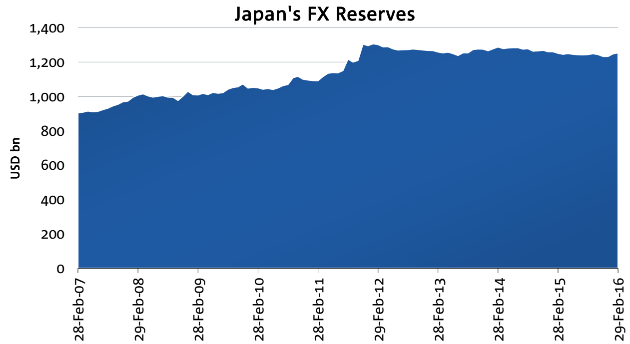
Source:EconData DX



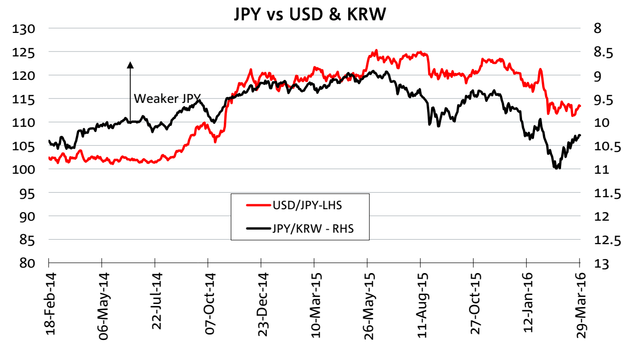
Source: Ministry of Finance

... Helping push up the Japanese Yen

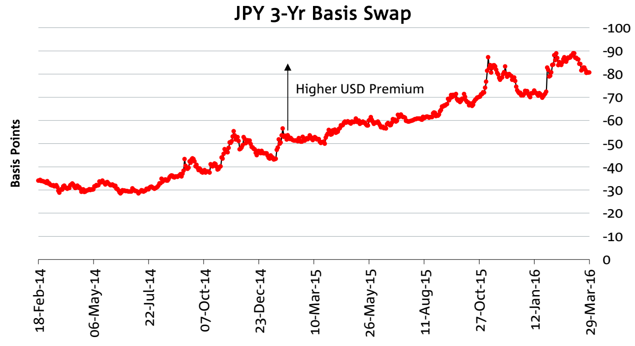
- Japan's foreign exchange reserves remain high, and at USD1.25 trillion are the second highest in the world, after China.
- Taken together, the high level of FX reserves, the strong Net International Investment position and the high Current account surplus point to a very strong external position. This has helped cement Japan's reputation as a safe haven during times of market turbulence.
- In fact, this helps explain – in part – the strength of the JPY (Japanese Yen) during the recent period of market ructions. The JPY had been trading above 120 during 2015. However, it has strengthened considerably during 2016. The decision to adopt negative interest rates led to a brief surge in the JPY above 120. However, such a move proved fleeting, and the JPY strengthened in a general risk-off environment. The JPY has appreciated by around 11% since its trough around mid 2015.
- The JPY has also appreciated against the Korean Won (KRW), rising by 14% since the lows in June 2015. More recently, JPY has reversed some of its prior appreciation against the KRW. The KRW has strengthened in March as global players turned net buyers of Korean stocks and bonds, encouraged by the recent rally in commodity prices and comments by the Chinese authorities that they won't devalue the Yuan. South Korea and Japan compete in a number of export segments, including industrial machinery and electronics, and movements in the relative exchange rate are of importance to both these countries.
- Looking further ahead, NAB FX Strategy expects downward pressure on the JPY going forward, ending 2016 at 117/USD, which would be beneficial to Japan's exports and overall economic outlook.
- Finally, US dollar funding premiums remain elevated, as indicated by the JPY 3-Year basis swap rates. From a low of around 0.43% in May, they are currently around 0.81%. What this means is that foreign investors with USD can purchase Japanese assets (including JGBs) and earn the funding premium, which helps mitigate against the generally low and negative yielding Japanese assets. As long as the funding premium remains elevated, overseas investors are likely to show interest in Japanese securities, despite the poor yields on offer.



Source:Bloomberg



Source:Bloomberg



Source:Bloomberg

National Australia Bank

Equity market ebbs; bonds become more volatile and yields turn negative

- The Nikkei 225 has fallen close to 20% since its peak in July 2015 – when it was around 20,800 index points . A general risk-off environment, which has resulted in falling prices oil and other commodity prices, as well as concerns about China and a stronger JPY have been some of the factors underpinning this fall.

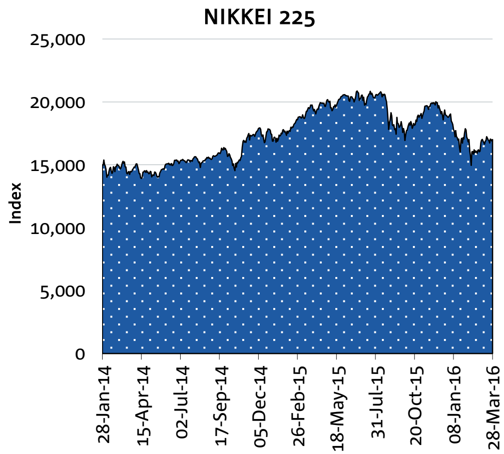
- Over the last few days, the Nikkei has retraced some of its losses to trade above the 17,000 mark. Supportive comments by Central bankers, combined with an easing in the Japanese Yen below 113/USD have supported Japanese equities. Equity gains were driven by rubber products, precision instruments and transport-related products, according to analysis from the *Nikkei* publication.

- Looking ahead, the path of the JPY will be a critical factor in determining the outlook for equities.

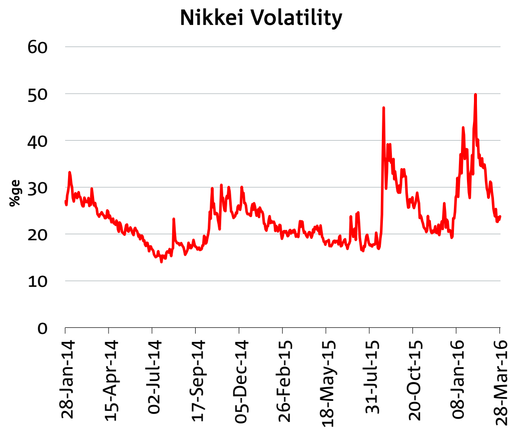
- Equity market volatility has abated somewhat in March. Over the past year there have been 2 distinct episodes of elevated volatility: the managed depreciation of the Yuan by the Chinese authorities in August 2015; and the implementation of a negative policy rate in February, 2016.

- Benchmark 10- year JGBs have moved into negative territory following the launch of a negative interest rate policy by the BOJ. They were last trading around -0.09%. In fact, bonds up to 10 years' maturity have been trading at negative yields. Such low rates are historically unprecedented, and have generated some confusion in the market.

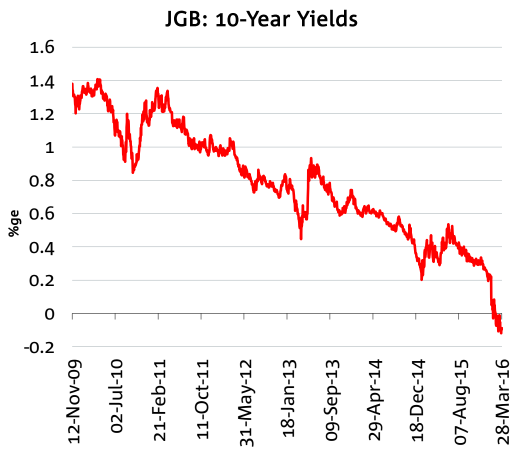
- JGB volatility futures – a measure of uncertainty – spiked following the launch of negative interest rates. They have eased somewhat, but still remain high, indicating lingering problems regarding negative interest rates. Volatility has also been impacted by the high ownership concentration (around a third) of JGBs by the BOJ, which has reduced liquidity in the market.



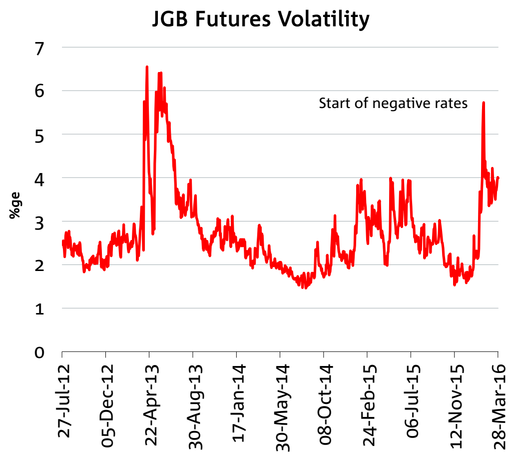
Source: Bloomberg



Source: Bloomberg



Source: Bloomberg



Source:Bloomberg

National Australia Bank

Authors

- Tony Kelly – Senior Economist, International

Antony.Kelly@nab.com.au

- John Sharma – Economist, Sovereign Risk

john_sharma@national.com.au

Group Economics
Alan Oster
Group Chief Economist
+61 3 8634 2927

Jacqui Brand
Personal Assistant
+61 3 8634 2181

Australian Economics and Commodities
Riki Polygenis
Head of Australian Economics
+(61 3) 8697 9534

James Glenn
Senior Economist – Australia
+(61 3) 9208 8129

Vyanne Lai
Economist – Australia
+(61 3) 8634 0198

Amy Li
Economist – Australia
+(61 3) 8634 1563

Phin Ziebell
Economist – Agribusiness
+(61 4) 75 940 662

Industry Analysis
Dean Pearson
Head of Industry Analysis
+(61 3) 8634 2331

Robert De Iure
Senior Economist – Industry Analysis
+(61 3) 8634 4611

Brien McDonald
Senior Economist – Industry Analysis
+(61 3) 8634 3837

International Economics
Tom Taylor
Head of Economics, International
+61 3 8634 1883

Tony Kelly
Senior Economist – International
+(61 3) 9208 5049

Gerard Burg
Senior Economist – Asia+(61 3) 8634 2788

John Sharma
Economist – Sovereign Risk
+(61 3) 8634 4514

Global Markets Research
Peter Jolly
Global Head of Research
+61 2 9237 1406

Australia
Economics
Ivan Colhoun
Chief Economist, Markets
+61 2 9237 1836

David de Garis
Senior Economist
+61 3 8641 3045

Tapas Strickland
Economist
+61 2 9237 1980

FX Strategy
Ray Attrill
Global Co-Head of FX Strategy
+61 2 9237 1848

Rodrigo Catril
Currency Strategist
+61 2 9293 7109

Interest Rate Strategy
Skye Masters
Head of Interest Rate Strategy
+61 2 9295 1196

Alex Stanley
Senior Interest Rate Strategist
+61 2 9237 8154

Credit Research
Michael Bush
Head of Credit Research
+61 3 8641 0575

Simon Fletcher
Senior Credit Analyst – FI
+61 29237 1076

Andrew Jones
Credit Analyst
+61 38641 0978

Distribution
Barbara Leong
Research Production Manager
+61 2 9237 8151

New Zealand

Stephen Toplis
Head of Research, NZ
+64 4 474 6905

Craig Ebert
Senior Economist
+64 4 474 6799

Doug Steel
Markets Economist
+64 4 474 6923

Kymberly Martin
Senior Market Strategist
+64 4 924 7654

Jason Wong
Currency Strategist
+64 4 924 7652

Yvonne Liew
Publications & Web Administrator
+64 4 474 9771

Asia
Christy Tan
Head of Markets Strategy/Research, Asia,
+ 852 2822 5350

Julian Wee
Senior Markets Strategist, Asia
+ 65 6632 8055

UK/Europe
Nick Parsons
Head of Research, UK/Europe,
and Global Co-Head of FX Strategy
+ 44207710 2993

Gavin Friend
Senior Markets Strategist
+44 207 710 2155

Derek Allassani
Research Production Manager
+44 207 710 1532