INTERNATIONAL MONETARY FUND

SOUTH AFRICA

SELECTED ISSUES

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June 16, 2016

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CONTENTS

THE IMPACT OF CHINA'S GROWTH SLOWDOWN AND LOWER COMMODITY PRICES ON SOUTH AFRICA[1]

This paper estimates the impact of China's growth slowdown and the recent large decline in commodity prices on South Africa. It seeks to identify the key channels through which a shock to China's economy is transmitted to South Africa, as well as the propagation of this shock within the economy. Our findings suggest that China's growth slowdown is likely to have a significant impact on South Africa's economy, with commodity prices and global financial conditions the main transmission channels. Sectoral interlinkages are found to play an important amplifying effect, notably through employment, corporate profitability, and wealth effects.

A.   Linkages between South Africa and China

1.   Increasing trade linkages have made China the most important single-country destination for South African exports. China now absorbs 10 percent of South African exports compared to around 2½ percent in the mid-2000s. This trend reflects not only rapid growth in China and the associated rise in China's demand for commodities, but also weak demand from the Euro Area whose share of South Africa's exports has declined to 15 percent from more than 20 percent over the same period. Sub-Sarahan Africa (SSA) remains the most important regional destination for South African exports.

South Africa: Export Destinations
(percent of total exports)
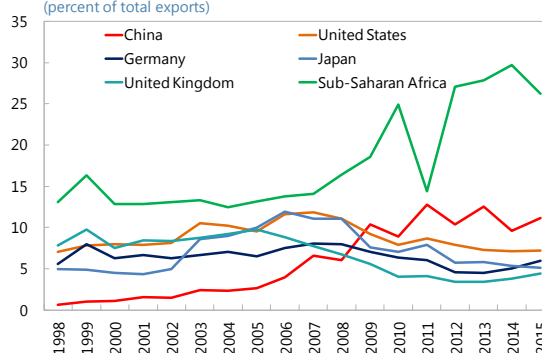
Source: IMF DOTS

2.   China's impact on the South African economy is magnified by China's role in the global economy and commodity markets.

- China accounts for around 17 percent of global output in PPP terms compared to 16 percent for the US. In terms of imports, China accounted for approximately 16 percent of the world total compared to 14 percent for the U.S.

- More than 60 percent of the world's traded iron ore—South Africa's main

China's Role in South Africa's Main Commodities 1/
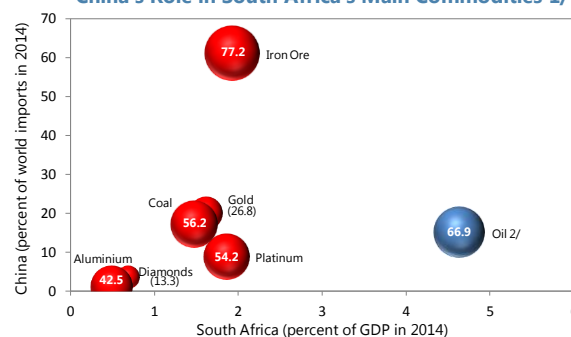
1/ The size of the bubbles represents the fall in real prices from end-2010 to end-January 2016
2/ South Africa is an oil importer
Sources: Bloomberg, UN Comtrade and MIT Observatory of Economic Complexity

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[1] Prepared by Manabu Nose, Magnus Saxegaard, and Jose Torres.

mineral export—is absorbed by China. China also plays a large role in other commodities that South Africa exports including coal, gold, and platinum. As a result, China plays a key role in determining global demand and prices of South Africa's main commodity exports, which now account for 34 percent of total goods exports (51 percent when manufactured commodities are included). China is also one of the world's largest oil importers, and therefore plays an important role in setting the price of South Africa's oil imports (though supply factors have been key for prices), which account for around 16 percent of total goods imports.

3.   Capital flows into South Africa from China are modest, but financial spillovers are increasing.

- Both direct investment and portfolio flows from China are increasing, but remain modest relative to capital flows from the UK and the US. However, as noted in the April 2016 Global Financial Stability Report, financial conditions in China are now increasingly affecting global financial conditions, mainly through equity and FX markets.

Change in the Composition of the Johannesburg Stock Exchange
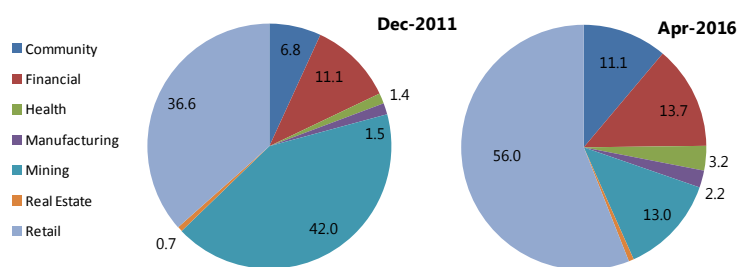
Note: Uses London price to compute a price for Glencore which joined the JSE in 2013.
Sources: Bloomberg and staff estimates.

- The Johannesburg Stock Exchange (JSE) equity index beta with China's HSCEI index (after controlling for movements in the VIX and S&P500) has increased to 0.2 from less than 0.1 in 2005, likely reflecting South African corporates increasing reliance on exports to China. Also, the share of mining companies in the JSE has declined to 13 percent in April 2016 from 42 percent at end-2011. Though this partly reflects the increasing valuation of non-mining companies, the decline in importance of the mining sector in the JSE points to sizeable wealth effects from the decline in commodity prices.

- The FX beta with the Chinese renminbi (after controlling for a U.S. dollar index and the VIX) has increased to 1.3 since August 2015 from 0.9 in a longer sample starting in January 2013, and is one of the highest among EM peers. The

FX Beta with Chinese Renminbi
(up to March 2016)
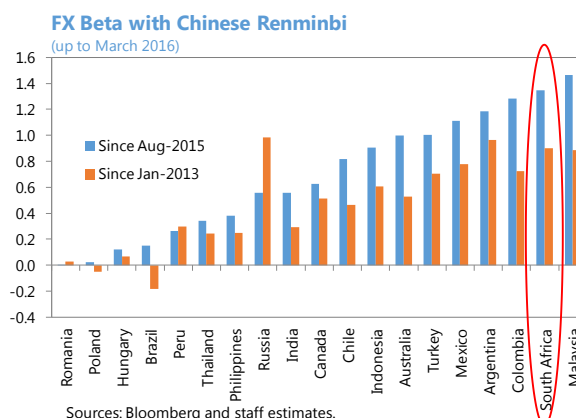
Sources: Bloomberg and staff estimates.

increasing correlation with the Chinese renminbi suggests that it may be acting as a proxy for market confidence in Chinese policymakers' ability to manage the rebalancing and slowdown of the Chinese economy, and thus the impact on EM commodity exporters.

B.   Assessing the Impact of Lower Growth in China on South Africa

4.   A VAR analysis suggests a slowdown in China has a significant impact on South Africa, and exceeds that from other countries. A simple VAR estimated on quarterly real GDP growth in the U.S., the European Union, China, and South Africa from 2000 onwards suggests that a one percentage point decline in China's real GDP growth would lower South Africa's growth by 0.3 percentage points after one quarter.[2] This is smaller than the impact of a similar shock to the U.S. or E.U. growth and broadly consistent with estimates in other studies including the World Bank's June 2015 Global Economic Perspectives. However, the impact of a shock to China's growth rises to 1 percentage point when the sample is restricted to the past five years (2010-15), significantly exceeding that of the U.S. and E.U. This result is consistent with our earlier finding that both trade and financial linkages with China have increased significantly in recent years. The period 2010-2015 also coincided with an increase in the importance of structural bottlenecks in South Africa (e.g. electricity shortages, protracted strikes, etc): to the extent that these structural factors disproportionaly affected exports to China (e.g. strikes in the mining sectors), the VAR may overstate the impact of a slowdown in China. On the other hand, the use of overall GDP—rather than GDP in the secondary sector which is more closely related to the demand for South African export commodities and where the

Spillovers from the US, EU, and China to South Africa

	US	EU	China
	Latest sample (2010-15) 2/		
Growth impact 1/	-0.3	-0.2	-1.0
	Full sample (2000-15) 2/		
Growth impact 1/	-0.4	-0.7	-0.3

1/ Impact of a 1 percentage point negative growth shock on South Africa's growth after 1 quarter.
2/ Annual frequancy.
Source: Staff estimates

Impact of Growth Shock in the US, EU, and China on South Africa
(percentage points of real GDP growth)

Source: Staff estimates.
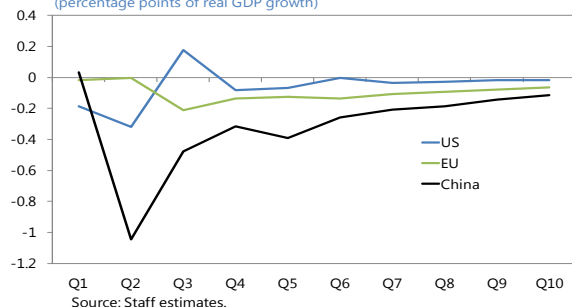
China GDP Growth
(percent)

Sources: China National Bureau of Statistics, Haver Analytics

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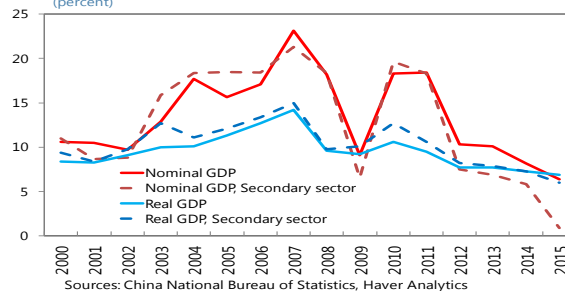
[2] The VAR is estimated on seasonally adjusted annualized quarterly real GDP growth and one lag of the endogenous variables as suggested by different information criteria using data from 2000Q1-2015Q3. The results are derived using generalized impulse response functions (GIRF) proposed by Pesaran and Shin (1998) which are unaffected by the ordering of the variables in the VAR.

slowdown in sharper, especially in nominal terms—could underestimate the impact of a growth shock in China.[3]

5. **Commodity prices and tighter global financial conditions are the main transmission channels.** In order to identify the relative importance of different transmission channels we follow the approach in Bayoumi and Swiston (2008) and augment the baseline specification described above with additional explanatory variables to capture potential transmission channels: trade, export and import commodity prices. Financial spillovers (proxied by U.S. financial conditions) are also included to capture glo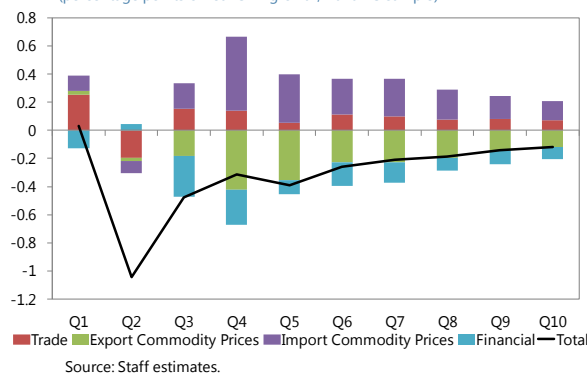bal confidence effects that could also be important. To capture the importance of each transmission channel we compare our baseline VAR with four auxiliary VARs where variables that capture the different transmission channels are included as exogenous variables one at a time.[4] In particular, let r_t be the impulse responses from the

Impact of Growth Shock in China: Spillover Channels
(percentage points of real GDP growth, 2010-15 sample)

Source: Staff estimates.

baseline VAR and r_t^{trade} the impulse response functions from the auxiliary VAR where the trade channel is included as an exogenous variable. The importance of the trade channel in transmitting shocks to growth in China can then be captured as the difference between the impulse response functions from the two VARs:

$$B_t = r_t - r_t^{trade}$$

The results suggest that the decline in South Africa's export commodity prices resulting from a shock to China's growth has a large and persistent impact on output growth in South Africa. The importance of this channel (which will be explored in more detail later) is consistent with our earlier discussion which suggests that China plays a major role in determining global demand for South

Africa's main commodity exports. Financial spillovers that may capture global confidence effects are also important, pointing to the increasing impact of Chinese economic developments on global confidence and financial markets. Spillovers to trade volumes are small and positive, suggesting the

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[3] Estimation using real GDP in China's secondary sector is hampered by data limitations and would also complicate a cross-country comparison.

[4] The trade channel is captured by quarterly annualized growth in the volume of goods exports. The export and commodity price channel is captured by the growth rate of a weighted average of the world price of South Africa's most important export commodities (aluminum, diamonds, coal, platinum, and iron ore). To aid identification the import price channel is identified as the difference between the commodity terms of trade and export commodity prices. The financial channel is captured by the Chicago FED financial conditions index, which captures a broad range of U.S. financial indicators including credit spreads, the VIX, and liquidity measures. A specification which instead uses the VIX index to capture the financial channel yields broadly similar results.

positive impact of exchange rate depreciation on total South African exports outweighs the impact of a decline in trading partner growth on the demand for South African exports. Declining import commodity prices (mainly oil) provide a partial offset.

C. Domestic Propagation of Commodity Price Shocks

6.   Sectoral interlinkages between the commodity sector and the rest of the economy are significant. We use an input-output (IO) table to identify the industries that are directly or indirectly

Intersectoral Linkages with the Commodity Sector

Note: The size of the bubbles represents the share in GDP;
the thickness of the arrows represents the strength of the sectoral interlinkages.
Sources: EORA MRIO Database and staff estimates.
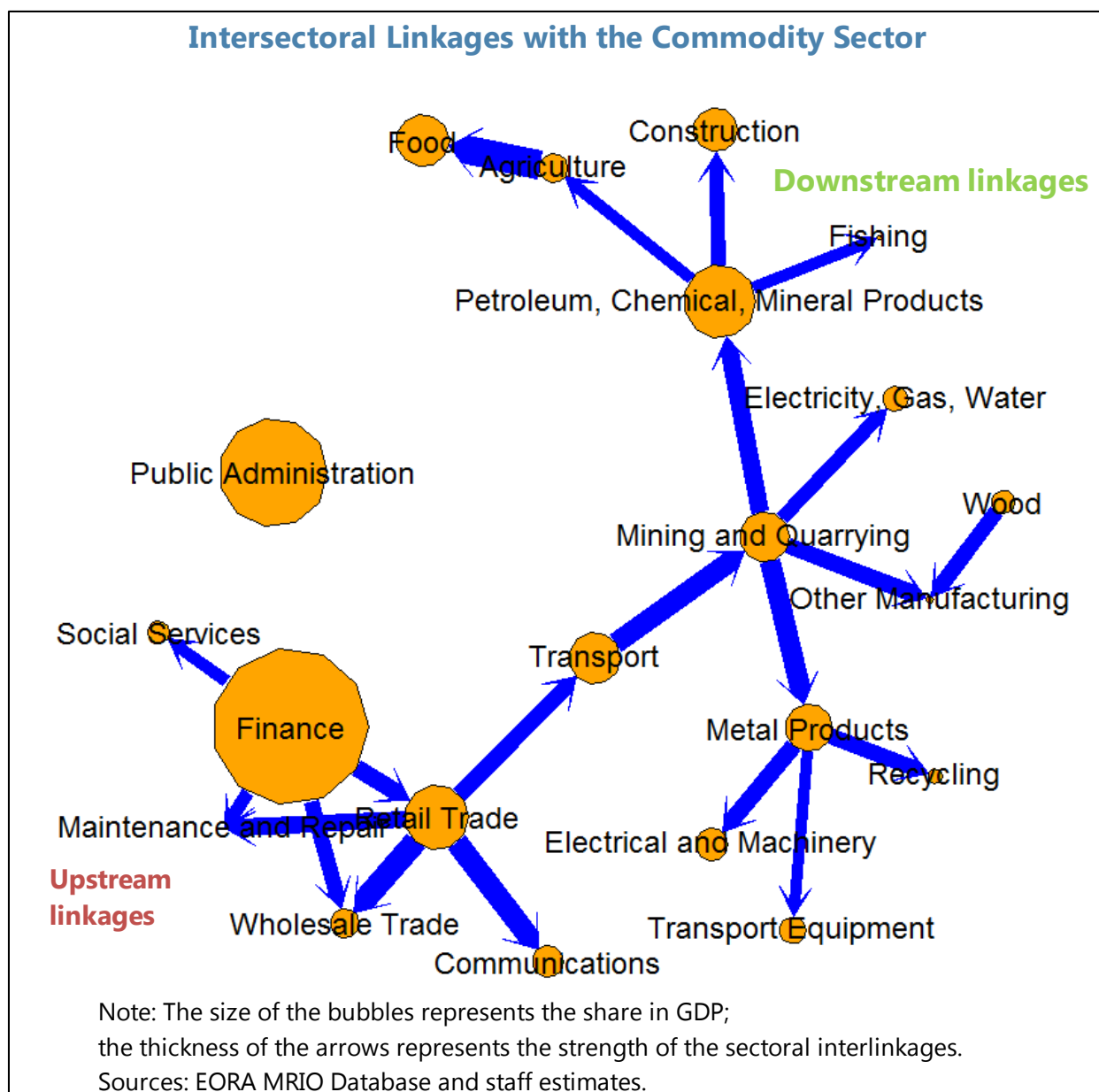
linked to the mining sector in South Africa.[5] The industry with the most important upstream linkages (sectors that are used as intermediate inputs by the mining sector) with the mining sector is transportation. Important downstream linkages (sectors that use output from the mining sector as inputs) include: metal production; petroleum, chemical, and mineral production; and other manufacturing. The mining multiplier calculated from the IO table suggests a R1 million increase in mining output raises output in the overall economy by R1.8 million (i.e. the indirect effect is R0.8 million). This is slightly higher than the mining and quarrying sector multiplier estimated by the South African National Treasury and the Chamber of Mines.[6]

7.   A structural VAR analysis confirms that the impact of commodity price shocks is amplified by sectoral interlinkages.

- We estimate a sectoral structural VAR identified using multipliers from the input-output table in order to investigate the importance of sectoral interlinkages in amplifying the impact of commodity export price shocks. In particular we estimate the following structural VAR:

$$AY_t = c + B(L)Y_t + C(L)x_t + u_t$$

    where Y_t is a vector of endogenous variables which includes a South Africa-specific commodity export price index (P_t^{ex}) and the growth contributions of real value-added in the mining (VA_t^{mining}) and non-mining ($VA_t^{non-mining}$) sectors. x_t is a vector of exogenous variables which includes a South Africa-specific commodity import price index, growth in South Africa's main trading partners, and a measure of global financial conditions.[7] The structural VAR is identified using parameter restrictions derived from the IO table:

$$A = \begin{bmatrix} 1 & 0 & 0 \\ b_1 & a_{11} & a_{12} \\ b_2 & a_{21} & a_{22} \end{bmatrix}, \quad Y_t = \begin{bmatrix} P_t^{ex} \\ VA_t^{mining} \\ VA_t^{non-mining} \end{bmatrix}$$

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[5] We use the Eora Multi-Region input-output (MRIO) table (25 sectors) together with Statistics South Africa's IO table (50 sectors) for 2012. A similar IO analysis was used by IMF (2014) to estimate the spillover from an energy boom in Canada to other industries and its broader macroeconomic impact.

[6] National Budget Review 2016, Chapter 2: Economic Overview.

[7] The commodity export and import price indices are computed as the growth rate of a weighted average of the prices of 47 commodities (in U.S. dollars) including precious metals. The values of exports and imports in the previous period are used as the weight in constructing the index following Gruss (2014). Growth in South Africa's main trading partners is captured by trade-weighted real GDP growth in China, the United States, and the European Union. Global financial conditions are proxied by the Chicago Fed's financial conditions index. The VAR is estimated using one lag of the endogenous variables as suggested by different information criteria on data from 2000Q1-2015Q2.

where a_{ij} is a coefficient measuring the magnitude of transactions between the mining and non-mining sectors taken from the IO table and b_i are parameters to be estimated.

- The results suggests that a 10 percent fall in the growth rate of export commodity prices would reduce real GDP growth by nearly 0.2 percentage points after two years.[8] The direct impact coming through the mining sector is relatively small and dies out relatively quickly. However, the indirect impact on upstream and downstream industries is more prolonged and larger than implied by the IO analysis, suggesting that a decline in commodity

Quarterly growth impact of a 10 percent fall in commodity export prices
(percentage points, 2000Q1-2015Q2 sample)

Source: Staff estimates.

export prices has a negative impact beyond that captured in the IO table. A caveat is the fact our VAR does not account for the increasing importance of structural bottlenecks in the economy (e.g. electricity), which coincided with a period of declining commodity prices. This could affect our estimate of the overall impact of a decline in commodity prices and—to the extent these bottlenecks affect the mining and non-mining sectors differently—the relative importance of the direct and indirect effects.[9]
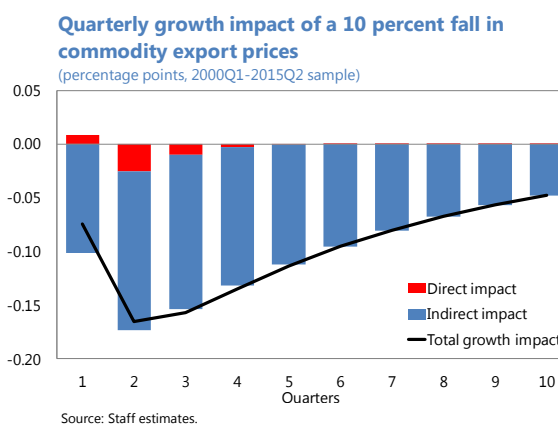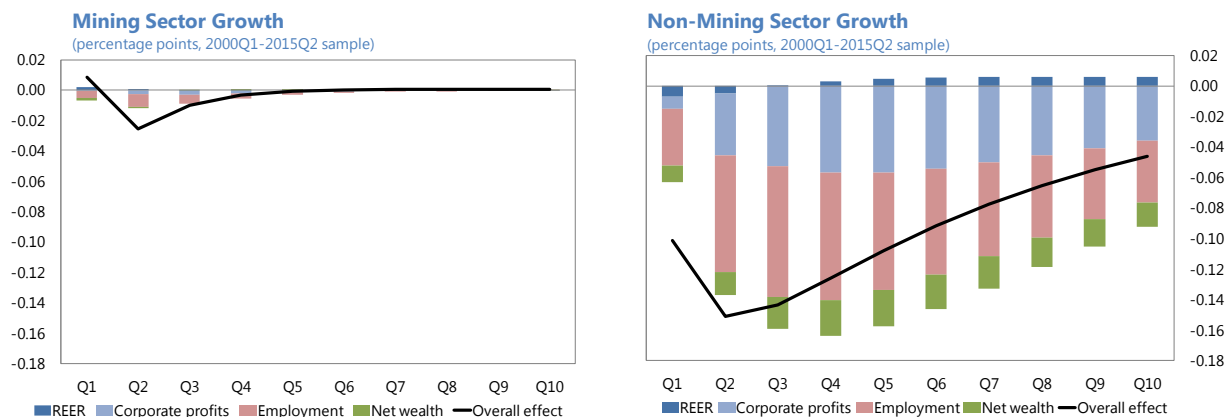
8. **Commodity price shocks are transmitted to the economy mainly through changes in corporate profitability and employment.** We use the approach in Bayoumi and Swiston (2008) described above to quantify the relative importance of four potential channels that transmit the impact of a shock to export commodity prices on the economy: the real effective exchange rate (REER), employment, and the growth rates of net wealth and the gross operating surplus in the economy. Our results suggest that the main channels whereby lower export commodity prices spillover to non-mining sector growth include lower economy-wide income resulting from the decline in employment and lower corporate profitability. A decline in net wealth in the household and corporate sectors also plays a role. The REER does not play a substantial role, which is consistent with the slow responsiveness of export volumes to the REER depreciation observed in recent years.

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[8] The overall GDP impact is derived using a simplified VAR where the growth contributions of real mining and non-mining value added are replaced by overall real GDP growth.

[9] Accurately measuring these bottlenecks is not easy, but could be a promising area of future research.

Impact of a Shock to Export Commodity Prices: Spillover Channels
(10 percentage point drop in prices)

Mining Sector Growth
(percentage points, 2000Q1-2015Q2 sample)

REER — Corporate profits — Employment — Net wealth — Overall effect

Non-Mining Sector Growth
(percentage points, 2000Q1-2015Q2 sample)

REER — Corporate profits — Employment — Net wealth — Overall effect

Source: Staff estimates.

D. Conclusion

9.   China's growth has been found to have large spillover effects on South Africa, transmitted mainly through commodity prices and global financial conditions, and amplified by sectoral interlinkages. The analysis in this paper suggests that rising trade and financial linkages with China, as well as China's large role in the global economy and commodity markets, has increased the impact of a growth slowdown in China, which now exceeds that of a growth slowdown in the U.S. and the E.U. Commodity prices and tighter global financial conditions are the main international transmission channels. Domestically, the impact of a fall in commodity export prices is amplified by linkages between the mining and non-mining sectors, and is transmitted to the economy through large falls in mining sector employment, corporate profitability, and wealth effects.

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MACRO-FINANCIAL LINKAGES: CAPITAL FLOWS, SOVEREIGN RATINGS, AND THE FINANCIAL SECTOR NEXUS[1]

This paper discusses key macro-financial linkages and related risks in the South African economy focusing on downside scenarios that are not part of the baseline. South Africa's high reliance on external finance, with banks intermediating a larger share of capital flows in recent years, exposes it to the risk of capital flow shocks. Low growth, rising interest rates, and fiscal risks could generate negative feedback loops among lower capital flows, heightened sovereign risk, and a weaker financial sector. The confluence of these factors could raise financial institutions' funding and credit costs, and widen the fiscal deficit given the high reliance of tax revenues on the financial sector. While so far the financial sector has not hampered growth, a weaker financial sector could reduce lending, and in turn lower growth. Sovereign rating downgrades are a possible trigger of capital outflows. A downgrade of the sovereign foreign currency (FX) debt to speculative grade seems to be mostly priced in and is likely to have a limited impact on the sovereign given the low level of government FX debt. A potential downgrade of the local currency (LC) sovereign debt rating to speculative grade is not in staff's baseline, as the latter is currently two to three notches above non-investment grade. If it were to happen, however, it could trigger sizable capital outflows and generate some of the feedback loops described above, given large nonresident holdings of government debt, about a fifth of which are estimated to require investment grade rating. The floating exchange rate regime and South Africa's deep capital markets are likely to mitigate such shocks.

A. The Role of Capital Flows in the South African Economy

1.   South Africa is highly reliant on capital flows. South Africa's current account deficit averaged 4.1 percent of GDP in 2005-14, one of the largest among emerging market economies. While the current account deficit has begun to adjust, declining to 4.3 percent of GDP in 2015 (from a peak of 5.7 percent of GDP in 2013), it remains large by international standards. A large and persistent current account deficit has led to an increase in external debt, which stood at 39.4 percent of GDP as of December 2015, up from 25.8 percent of GDP in 2008. It also contributes to relatively large annual gross external financing requirements, which stood at about 19 percent of GDP as of September 2015.[2] However, about half of the external debt is denominated in local currency. In addition, the current account balance includes payments payable in rand, such as the South African Customs Union' transfers and the interest due on rand-denominated debt.

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[1] Prepared by Hui Miao, Pablo Morra, and Yi Wu.

[2] The gross external financial requirement is the sum of the projected current account deficit for the following year (4.1 percent of GDP for 2016) and the external debt coming due within one year (14½ percent of GDP as of September 2015, comprising mainly corporate and bank debt).

Elevated current account deficit ...
(percent of GDP)

... and gross external financing requirements
(percent of GDP, 2015Q4)
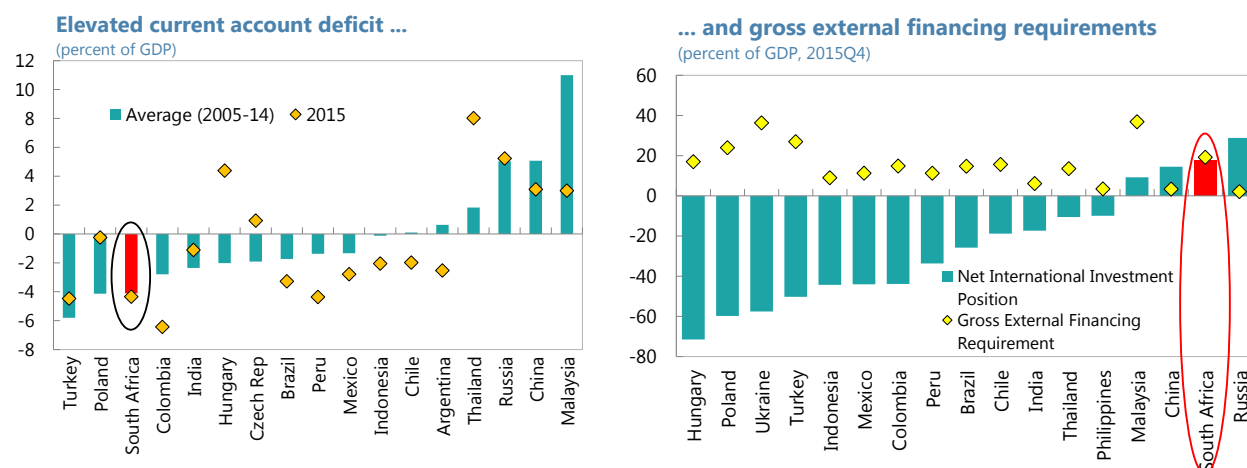
Sources: Haver, SARB, and staff estimates.

2.   The net international investment position became positive in 2015. South Africa's net international investment position shifted from -8 percent of GDP at end-2014 to 18 percent of GDP as of end-2015. The shift was facilitated by exchange rate depreciation, which reduced the U.S. dollar value of rand-denominated external liabilities. As of end-2015, South Africa's foreign assets stood at 157 percent of GDP, and external liabilities totaled 139 percent of GDP. While the positive net international investment position is a source of strength, gross liabilities are large compared to other emerging markets. Also, about 40 percent of total external assets are hard-to-liquidate foreign direct investment, while about one-half of the liabilities are portfolio investments by nonresidents, who could selloff quickly in the event of a shock.

3.   The external financing mix changed in recent years, shifting from portfolio and direct investment flows towards other investment flows and unrecorded transactions. South Africa used to rely more on portfolio and direct investment flows to finance its current account deficit. However, the external financing mix changed in recent years owing to: (i) a rise in outward foreign direct investment by South African companies that turned net foreign direct investment flows negative (-0.8 percent of GDP on average in 2014–15); and (ii) a moderation in net portfolio flows amid a significant decline in portfolio debt flows, as observed also in other emerging markets. Since 2013, other investment flows and unrecorded transactions rose significantly, and became the main sources of financing of the current account deficit.

External financing mix changed from portfolio flows to bank credit in recent years

Financing of the Current Account Deficit
(in percent of GDP)
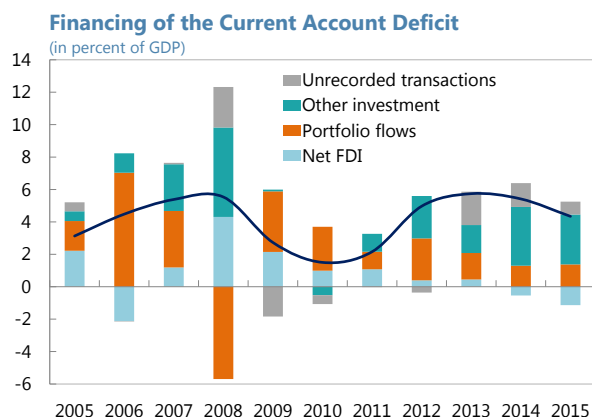
Nonresidents' share of local currency government bonds stabilized at a high level

Investor base of South Africa government LC marketable bond

Sources: Haver, SARB, and staff estimates.
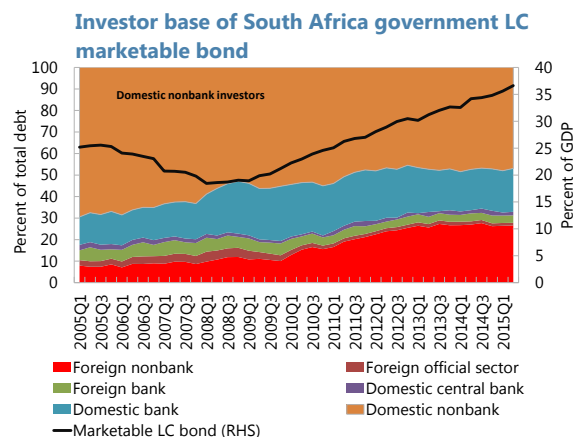
4.   Other investment flows comprise primarily bank flows (loans and deposits), while the source of the unrecorded transactions is unknown. A breakdown of the financial account of the balance of payments shows that other investment flows comprise primarily bank loans and deposit flows, with the remainder balance corresponding to financial derivatives, trade credit, and other net receivables. These flows increased significantly in recent years (from 1.5 percent of GDP in 2013 to 3 percent of GDP in 2015), suggesting that the banking sector assumed a bigger role in intermediating capital flows than in the past. The data also indicate that a significant share of the other investment flows are of short-term tenor (less than one year), and denominated in FX. While banks account for 23 percent of the total stock of external debt, they account for about 50 percent of the external debt coming due within one year. And while banks' FX position is small and within regulatory limits, there could be some maturity mismatches as part of the FX assets is corporate loans to fund acquisitions abroad, and in the event of a shock, the short-term tenor of the funding could pose rollover risks and hedging costs could rise.

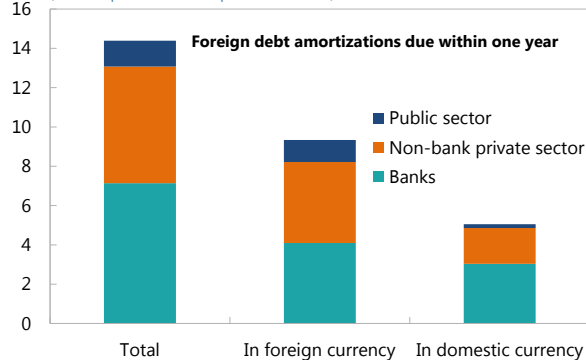**Other investment flows comprise primarily bank flows and are negatively correlated with portfolio flows**
(percent of GDP)
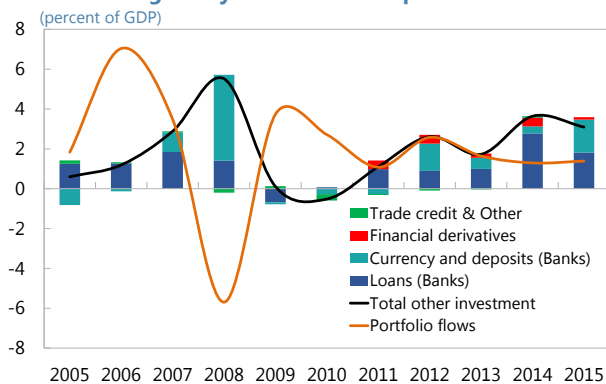
A significant share of bank flows are of short-term tenor
(as of September 2015, percent of GDP)
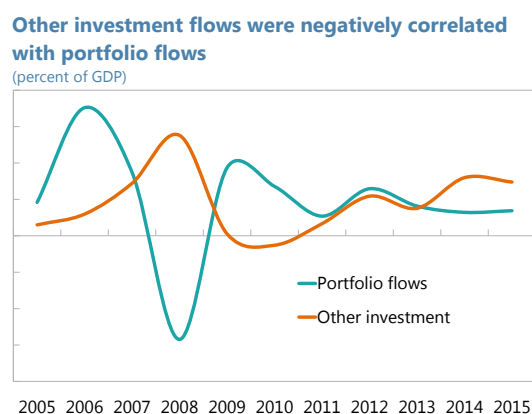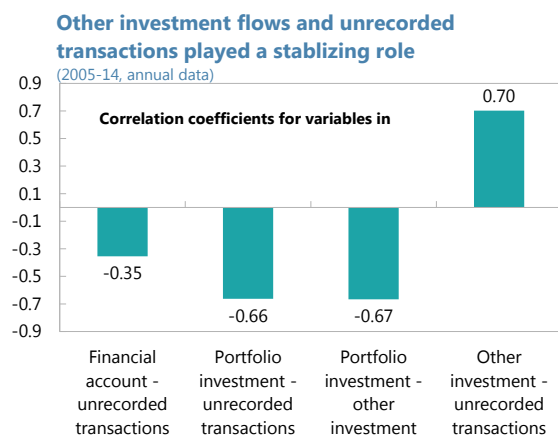

Sources: Haver, SARB, and staff estimates.

5. **Other investment flows and unrecorded transactions have played a stabilizing role thus far**. Correlation analysis shows that other investment flows have been negatively correlated with portfolio flows during 2005-15. In turn, unrecorded transactions have been negatively correlated with the financial account balance (net capital flows), particularly with portfolio flows; and positively correlated with other investment flows. Hence, empirical analysis suggests that other investment and unrecorded transactions contributed to external financing when other sources of financing (most notably portfolio flows) declined. While this may be due to relationship banking in the case of bank flows, this is not known for certain, and hence the sustainability of bank flows is uncertain. Also, the economic rationale for the unrecorded transactions is unknown, and hence cannot be assumed to continue in the future.

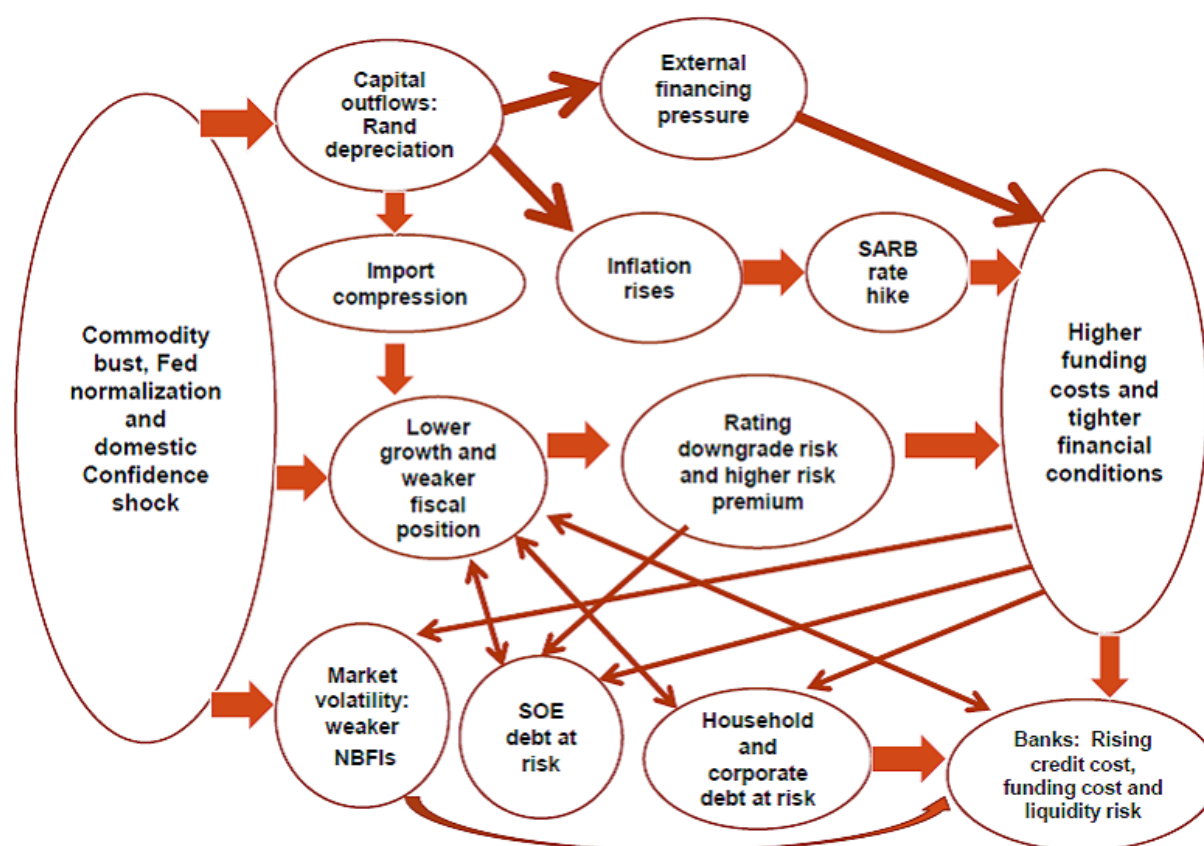**Correlation coefficients for variables in the financial account**
(2005-15, annual data)

	Financial account	Portfolio investment	Portfolio investment-equity	Portfolio investment-debt	Other investment	Other investment-currency and deposits	Other investment-loans	Other investment-banking sector	Unrecorded transactions
Financial account	1.00								
Portfolio investment		1.00							
Portfolio investment-equity			1.00						
Portfolio investment-debt			0.10	1.00					
Other investment		-0.66	-0.49	-0.52	1.00				
Other investment-currency and debt		-0.74	-0.68	-0.38		1.00			
Other investment-loans		-0.17	-0.16	-0.08		0.27	1.00		
Other investment-banking sector		-0.72	-0.58	-0.49		0.82	0.51	1.00	
Unrecorded transactions	-0.37	-0.66	-0.51	-0.48	0.71	0.54	0.58	0.75	1.00

Source:s: Haver, and staff estimates.

Other investment flows and unrecorded transactions played a stablizing role
(2005-14, annual data)

Other investment flows were negatively correlated with portfolio flows
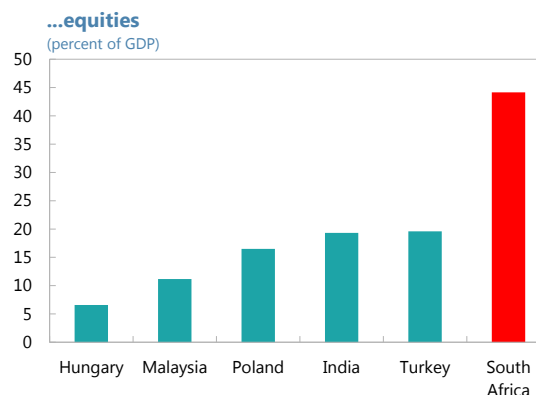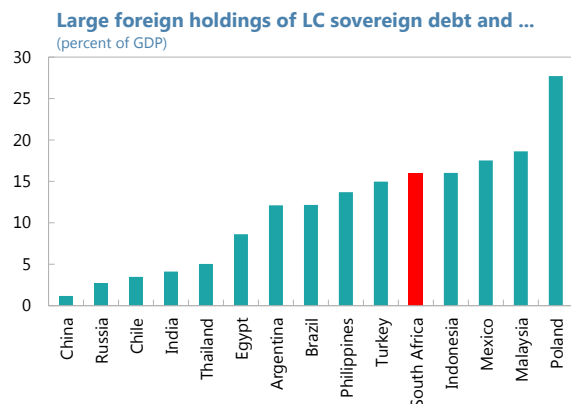(percent of GDP)

Sources: Haver, and staff estimates.

B. Capital Flows and Macro-Financial Linkages

6. **Capital flows may become scarcer, more volatile, and costlier in the coming years, posing risks for South Africa's external financing**. According to the April 2016 Global Financial Stability Report, the outlook for capital inflows to emerging market economies has deteriorated, as growth and return differentials are narrowing. In the projection period, we assume no unrecorded transactions (customary in IMF projections). For South Africa specifically, in line with recent trends, the outlook points to continued negative net foreign direct investment flows, as South African companies continue to pursue opportunities abroad partly due to subdued domestic growth; and lower and more volatile portfolio flows, as U.S. monetary policy normalizes and advanced economies' monetary policies move in opposite directions. In this context, the cost of capital is likely to increase. Fund staff project other investment flows to be the main source of South Africa's external financing in the coming years, compensating for the decline in other sources of external financing. However, it is unclear whether this complementary role of banks will continue as major European banks (accounting for 76 percent of total external bank lending to South Africa according to BIS data) are retrenching, with some institutions having declared their intention to sell their South African assets.

Large foreign holdings of LC sovereign debt and ...
(percent of GDP)

**...equities**
(percent of GDP)

Sources: Bloomberg and staff estimates.

7.   A potential pullout of foreign investors, divesting their existing holdings of local assets, also poses risks. South Africa's external portfolio liabilities, at 68 percent of GDP, are the largest among EMs, with foreign investors' holdings of bonds and equities at 20 and 48 percent of GDP, respectively.[3] The high level of participation of foreign investors in South Africa's financial and capital markets could present challenges if nonresidents were to liquidate a sizable part of their holdings in response to external or domestic shocks. Together with a floating exchange rate regime and deep financial markets, a favorable currency composition of the external debt could

Limited original sin in external debt
(in percent of GDP)

Source: SARB

mitigate this vulnerability, as about half of the total external debt is denominated in local currency. The currency denomination of the external debt, however, differs significantly by sector. While the bulk of the external debt of the government is denominated in local currency, the majority of the external debt of state-owned enterprises (SOEs), banks, and corporates is denominated in FX. SOEs are required to hedge their FX risk, though some FX risk hedging might be done on a rolling basis and might not be perfect for the full term of the loan; also the cost of hedging and/or collateral requirements might increase with a possible downgrade of SOEs' credit rating. Another mitigating factor in the event of a pullout of nonresident investors is that they are likely to take losses on the prices of their assets and hence the outflows would be reduced. This would apply both to portfolio equity and debt holdings, which are largely long-dated.

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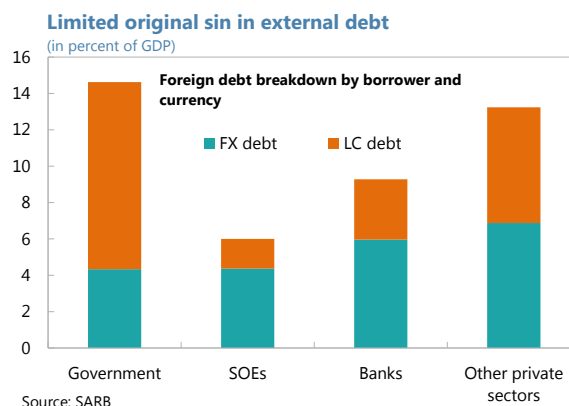
[3] See international investment position data reported by the South African Reserve Bank.

8.   Capital outflows would affect the economy through different channels, hurting growth though lowering the current account deficit. The immediate impact would be a depreciation of the rand, an increase in the interest cost of debt, and a decline in local asset prices (bonds and equity) with negative wealth effects, though the depreciation and falling asset prices are likely to induce some capital inflows by making the prices of local financial assets more attractive for foreign investors, helping put a floor to the decline. A weaker rand so far has had a limited impact on exports likely due to structural constraints and policy uncertainty.[4] Thus a large capital outflow shock is likely to reduce growth by forcing a sharp import compression and a sudden adjustment of the current account deficit (as seen in other emerging market countries). On a positive note, many international firms are listed on the Johannesburg Stock Exchange, and foreign earnings account for about half of total earnings of all listed companies. These firms will provide a buffer against currency depreciation, as their stocks will benefit from rand depreciation and are used by local financial institutions, whose foreign exposure is limited by prudential regulation, as FX hedges. But some importers (e.g. retailers) could suffer from rand weakness. Also about half of the foreign earnings are from EMs, whose currency might not appreciate against the rand as strongly as the dollar. Hence, the positive impact of a weak rand on stock prices should not be overstated.

9.   Capital outflows could also affect the financial sector, with negative second-round effects on growth and fiscal accounts. A large depreciation of the rand would raise inflation, likely requiring the South African Reserve Bank (SARB) to hike interest rates, which would hurt growth, as about 90 percent loans are at floating rates, linked to the policy rate. The slowdown in growth would reduce tax revenues. While banks' profitability would be initially boosted by higher interest rates, as loans re-price faster than banks' liabilities in South Africa, this effect would eventually reverse once funding costs and credit costs start rising. Ultimately, higher interest rates and slower growth would likely lead to a rise in non-performing loans (NPLs) and reduce banks' profitability. This would in turn have a significant adverse impact on fiscal revenue, given that a large share of income tax revenue stems from the financial sector (elaborated further below). The large size of South Africa's domestic financial sector would likely allow the government to secure the necessary financing in the domestic market (as external financing would be scarcer given the original shock). However, the resulting portfolio rebalancing by domestic financial institutions may trigger a further decline in equity prices (as about 60 percent of NBFIs' assets are invested in stocks), an increase in interest rates, and a decline in lending to the private sector (crowding-out), placing further downward pressure on growth.

10.   Banks' funding costs are rising and would increase more in case of capital outflows. Banks' funding costs have risen since 2013 due to higher policy rates and regulatory changes. Since December 2013, the policy repo rate has risen by 200 bps, and one-year negotiable certificate of deposits (NCD) rate, the benchmark for wholesale bank funding, has increased by 274bps. The gap

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[4] See Anand, Rahul, Roberto Perrelli, and Boyang Zhang (2016), "South Africa's Exports Performance: Any Role for Structural Factors?", IMF Working Paper No. 16/24; and Hlatshwayo, Sandile, and Magnus Saxegaard (2016), "The Consequences of Policy Uncertainty: Disconnects and Dilutions in the South African Real Effective Exchange Rate-Export Relationship", IMF Working Paper No.16/113.

between the NCD rate and the policy rate now stands at about 170 bps, near record high.[5] The required Liquidity Coverage Ratio (LCR)[6] will continue to rise by 10 percentage points each year to reach 100 percent in January 2019 (including up to 40 percent from the South Africa Reserve Bank's (SARB) committed liquidity facility.) The Net Stable Funding Ratio (NSFR) is to be fully implemented in 2018. As the SARB has recently announced that it will utilize national discretion applying an available stable funding factor of 35 percent to short-term funding from financial corporate customers (as opposed to zero), meeting the NFSR has become less challenging than assessed in the past. Nevertheless, going forward, banks will likely rely more on term funding and retail deposits. As a result, the outstanding amount of bank bonds is projected to rise significantly over the next five years, leading to an increase in the average cost of funding, as bond issuance is more expensive than short-term wholesale funding (currently accounting for about 60 percent of total bank liabilities). Hence, regulatory changes have so far contributed to tighter financial conditions under normal market conditions and are likely to continue doing so for the next few years. Also, to enhance the monetary policy transmission mechanism, the SARB has also gradually increased the size of the money market liquidity shortage.[7] It is likely that capital outflows would exacerbate the expected rise in funding costs.

Banks rely heavily on domestic wholesale funding
(in percent of total liabilities)
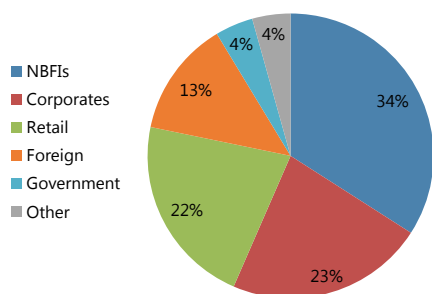
One-year negotiable certificate of deposits rate over policy rate near record high
(percent)
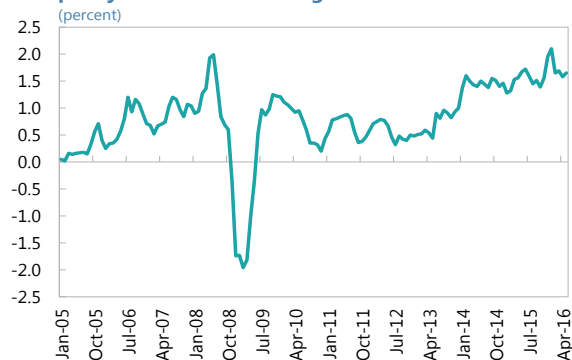
Sources: Haver, SARB, IMF.

11.   Banks' asset quality is likely to deteriorate even in the baseline scenario, though banks should be able to withstand sizable credit shocks.

- Households' debt-to-disposable income ratio is already high (78 percent), debt service has risen, and NPLs on the unsecured credit book have increased to 9.0 percent as of end-2015. After a few years of a falling NPL ratio, some bank analysts and credit rating agencies expect it to rise

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[5] The gap averaged 0.3 percentage points since 1998. The current gap is large by historical standards notwithstanding the expect policy rate hikes.

[6] Currently standing at 84 percent.

[7] The SARB drains liquidity from the banking system overnight to maintain the overnight rate. This creates a 'money market shortage'.

modestly over the next few years.[8] In case of adverse shocks, NPLs would rise more. Staff's analysis (IMF, 2014) suggests that a severely adverse scenario would lead to a significant increase in households' probability of default and reduce the Common Equity Tier 1 (CET1) ratio by 2.5 percentage points.

- In the corporate sector, pockets of credit stress have emerged in construction, mining, steel, and agriculture sectors, though credit to these sectors represents only 6 percent of bank loans. Declining corporate sector profitability has weakened the interest coverage ratio (ICR) of South

African corporates, though it still stands at 3 in 2015Q1-Q3, with the mining and quarrying industry the only industry that recorded an ICR below the benchmark of 2. The expected default frequency (EDF) of South African firms has also deteriorated. Nevertheless, a recent IMF study (Chow, 2015) points to only moderate corporate distress under a stress scenario that is similar to the global financial crisis, increasing NPLs only by 1-2 percentage points. This appears manageable given banks' high capital buffers (CET1 to risk-weighted assets at 13.6 percent) and high profitability.

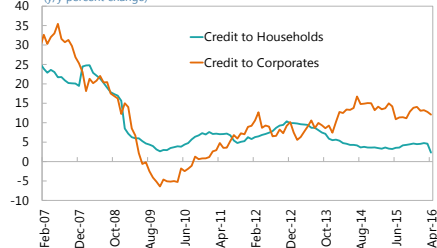**The expected default frequency of non-financial corporates has increased**
(percent of population)
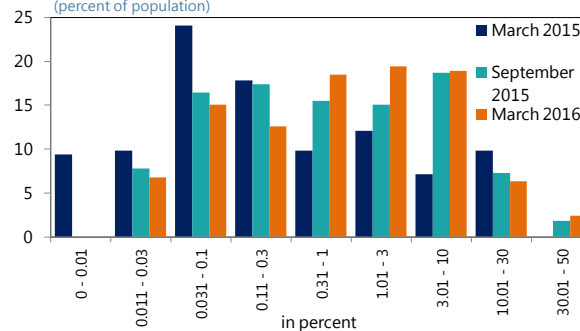
Source: SARB Financial Stability Reviews

Credit growth has moderated
(y/y percent change)

Source: South African Reserve Bank

Debt at risk remains relatively low
(in percent of total debt)
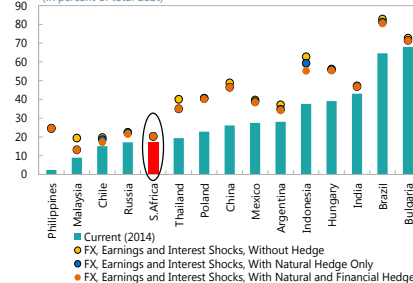
NPLs are modest
(in percent of total loans)
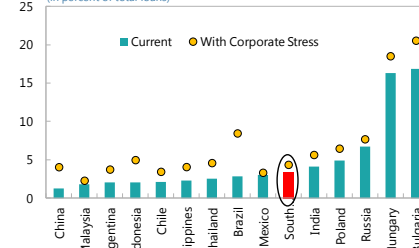
Sources: Haver and staff estimates.

12.   Recent stress tests conducted by the SARB indicate that banks are adequately capitalized to withstand significant credit losses under stress scenarios. Even in the most adverse scenarios with a protracted recession or excessive financial market volatility with capital flow reversal and significant depreciation, banks' average common equity tier 1 capital adequacy ratio remains above of the regulatory requirement.

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[8] See, e.g., JP Morgan (2015), Moody's (2016), and S&P (2016).

13.   The financial cycle seems to have peaked, though at a low level by historical standards, and appears linked to capital flows. After a period of strong growth, bank credit growth to households has moderated significantly, from a peak of 24.8 percent y/y in March 2008 to 2.3 percent in April 2016. Credit growth to corporates has remained more resilient (12.1 percent y/y as of April 2016), especially for renewable energy, investments abroad, and commercial property, and does not appear to have been a hindrance to investment. The financial cycle, which has a lower frequency than the traditional business cycle, has rebounded from its 2011 trough, but appears to have

Financial cycle has peaked at a relatively low level
(percent, y/y)

Sources: Haver, SARB, and staff estimates.

peaked at a low level.[9] The SARB has also determined that there is no need to activate countercyclical capital buffers for banks as the credit gap remains negative. Buoyant capital flows in the post-global financial crisis period helped finance the rising government debt and part of banks' operation, which likely allowed higher domestic funding for the economy than would have otherwise been the case. Also, South Africa's financial cycle has become increasingly correlated with the U.S. financial cycle (IMF, 2016). Furthermore, the peaks of the financial cycle are closely associated with financial stress. For example, the financial cycle peaked prior to the onset of the most recent global financial crisis. The financial cycle is expected to moderate further, as overall financial conditions tighten and capital flows are expected to moderate.
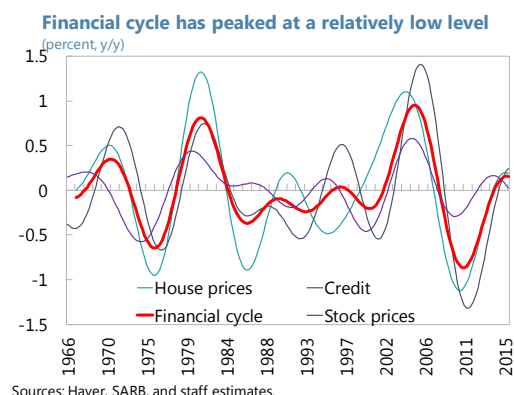
14.   In the event of significantly weaker growth, higher funding costs, and liquidity shocks, banks could cut credit, further lowering growth. In a severely adverse scenario, banks are likely to respond by deleveraging, reducing lending to the private sector, which accounts for 67 of their total assets. The magnitude of the credit growth decline and its impact on growth are difficult to quantify. Based on a cross-country distribution of credit growth and GDP growth, Fund staff estimate that a

Cross-country Distribution of Credit and GDP Growth

Probability	10%	25%	75%	90%
Credit growth 7%	0.5	2.6	5.9	7.5
Credit growth 4.5%	-0.5	1.6	5.4	6.8
Growth difference	1.0	1.0	0.5	0.7

Source: IMF

2½ percentage point decline in credit growth relative to the baseline scenario (from 7 percent to 4½ percent) could reduce real GDP growth by 0.5–1 percentage points.[10]

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[9]The financial cycle is estimated based on credit, and home and equity prices, using the Christiano-Fitzgerald band-pass filter.

[10] The table, which is based on a cross-country dataset, suggests that at credit growth of 7 percent, 10 percent of the countries had GDP growth below 0.5 percent, 10 percent of the countries had GDP growth above 7.5 percent, and 80 percent of countries had growth between 0.5 and 7.5 percent.

15. **A downturn in the financial cycle could also have important implications for the fiscal accounts.** South Africa's financial sector is large, with assets amounting to 300 percent of GDP, highly profitable, and employs a sizable and well-paid labor force. Finance, real estate, and business services account for 20 percent of GDP, and 22 percent of formal nonagricultural employment. The financial sector is even a more important contributor to fiscal revenue, accounting for about half of personal income tax and one third of corporate income tax. The profitability of the financial sector has remained robust amid a weakening economy in recent years, contributing to the high tax buoyancy. A shock affecting the financial sector could have a large impact on fiscal revenue, forcing the government to restrain government spending, with adverse second-round effects on growth.

C. The Impact of Potential Sovereign Debt Rating Downgrades

16. **One possible trigger of capital outflows could be a sovereign credit rating downgrade.** South Africa's sovereign credit rating is one to two notches above investment grade (IG) for FX debt, and two to three notches above IG for LC debt. Two rating agencies (Moody's and Standard & Poor's) have a negative outlook. Sovereign debt spreads suggest that markets assign a high probability that South Africa's sovereign FX debt credit rating will be downgraded to speculative grade. In contrast, market participants appear to attribute a low probability to the LC debt credit rating being downgraded to speculative grade, given the larger buffer in the rating. The downgrade of LC debt to speculative grade is not in staff's baseline. The next section discusses possible effects of credit rating downgrades.

South Africa's Long-term Sovereign Ratings

	Foreign Currency Debt			Local Currency Debt		
	Moody's	S&P	Fitch	S&P	Moody's	Fitch
Rating	Baa2	BBB-	BBB-	BBB+	Baa2	BBB
Outlook	Negative	Negative	Stable	Negative	Negative	Stable
Date of last outlook change	Dec-15	Dec-15	Dec-15	Dec-15	Dec-15	Dec-15
Date of last rating change	Nov-14	Jun-14	Dec-15	Jun-14	Nov-14	Dec-15

Sources: S&P, Moody's, and Fitch.
Note: Moody's does not differentiate between LC and FX credit risk. S&P allows a maximum difference of two notches.

## D. The Impact of a Foreign Currency Sovereign Debt Rating Downgrade

17. **The possible downgrade of the FX debt credit rating to speculative grade appears to be largely priced in, but an additional widening in spreads is likely if it materializes.** South Africa's 5-year credit default swap (CDS) spreads are currently trading in line with BB+ rated EMs, such as Turkey, Brazil and Russia, and the recent 10-year U.S. dollar-denominated sovereign bond placement was priced at a spread similar to other high yield (HY) sovereigns. Past episodes of sovereign downgrades to non-investment grade show that CDS spreads typically increase by about 100 bps before the downgrade takes place, and an additional 10-20 bps after it materializes. South Africa's 5-year CDS spread has increased by about 80 bps since November 2015 to 320 bps at end-May 2016. This suggests that most of South Africa's FX rating downgrade risk is probably priced in. However, if and when the downgrade materializes, additional widening of credit spreads is possible driven by forced sales by investors with mandates restricted to IG-rated securities. JP Morgan

estimates that such sales could amount to about US$2 billion based on their survey of institutional investors. It is also notable that there is a big dispersion in the widening of CDS spreads upon downgrade to speculative grade among countries. Some overshooting is possible depending on the rating outlook following the downgrade and on whether it will be viewed as likely to be followed by further downgrades.

South Africa's CDS trade as high-yield 1/

1/ Credit Rating represents average of ratings from S&P, Fitch and Moodys for each country. Data as on May 31, 2016.
Source: Bloomberg

18.   An FX rating downgrade would likely increase SOEs' and banks' funding costs, and could trigger covenants. A downgrade of the sovereign FX rating would likely be followed by rating downgrades of most other South African FX debt issuers, including SOEs and private sector entities, primarily banks. The effect on SOEs and banks could be more significant, and countries with large SOEs and limited fiscal space face a stronger sovereign-corporate nexus. SOEs, which are highly-leveraged and with about 40 percent of their total debt denominated in FX, could see a significant increase in funding costs. In the case of Eskom, the largest SOE, its funding costs have risen significantly since last November. Some SOEs' bonds or loans may have covenants contingent on maintaining an IG credit rating. Such covenants clauses may trigger a review, entail cost escalation, or in the worst case, lead to the loan becoming callable. The deterioration of the SOEs' balance sheets could in turn affect the sovereign via credit guarantees or other forms of financial support that might be required. In the case of banks, only about 10 percent of their liabilities are in foreign currency. However, a significant share of these, totaling about US$13.5 billion (4 percent of GDP) will come due within one year. Banks could also face an increase in funding costs, since the spread of their syndicated loans over Libor has largely increased in line with sovereign CDS spreads. Typically, syndicated loans for banks and private firms are of 3-year floating rates with fees and credit spreads tied to the sovereign rating. Nevertheless, given their strong balance sheets, banks are expected to maintain access to international capital markets, though at higher costs.

19.   An FX rating downgrade would likely increase the regulatory capital charge for international banks to hold South African government debt. For local banks, the risk weight for holding local currency government bond of South Africa is zero regardless of the sovereign ratings. But for South African bank branches of international banks, the home regulators will assign high risk weighting for bonds below investment grade regardless whether it is sovereign or not. For example, for BBB- rated government debt, foreign bank branches need to assign a risk weighting of 50 percent, but if government debt is downgraded to BB+, the risk weighting will double to 100 percent. Therefore, international banks, some of which are big players in South Africa's local government debt market, could see higher capital charges, and lead to higher government bond yields.

CDS spread typically widen upon downgrade

Eskom and Sovereign CDS spreads
(USD 5Y CDS spread)
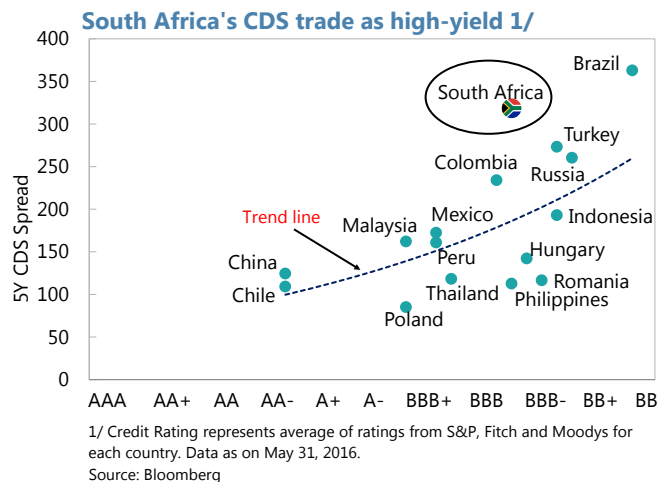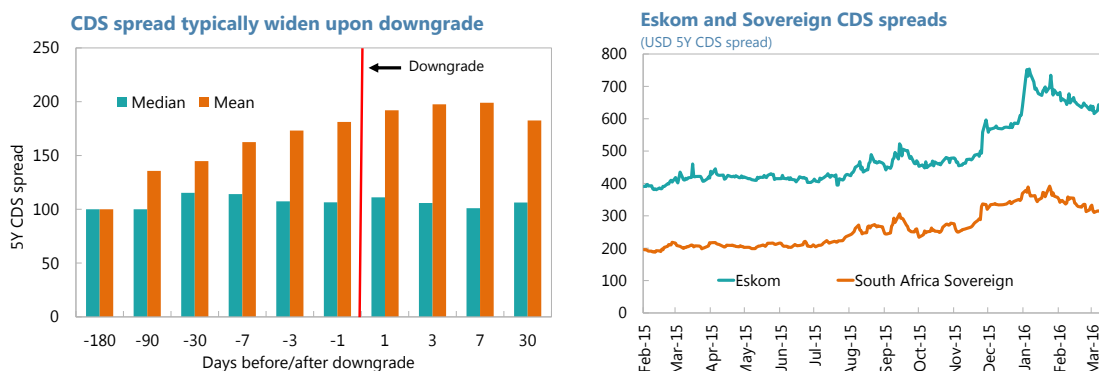
Sources: Bloomberg and staff estimates**.**

20.   An FX rating downgrade to speculative grade would likely worsen the profile of the nonresident investor base and could lead to more volatile capital flows. An FX debt rating downgrade could trigger a pullout by long-term oriented, more fundamentally-based, rating-sensitive real money investors, such as sovereign wealth funds, pension funds, and insurance companies. The pool of nonresident investors of government bonds would likely shift towards more short-term oriented, high-yield seeking investors. Such investors are generally smaller (e.g., hedge funds and mutual funds), and tend to trade more frequently, possibly resulting in more volatile capital flows. Moreover, most nonresident investors in South African securities are institutional investors. An IMF study on the behavior of different investor types following a downgrade of sovereign FX rating to speculative grade found that institutional investors tend to reduce their investment on average by 16 percent of assets under management and only return slowly. [11]
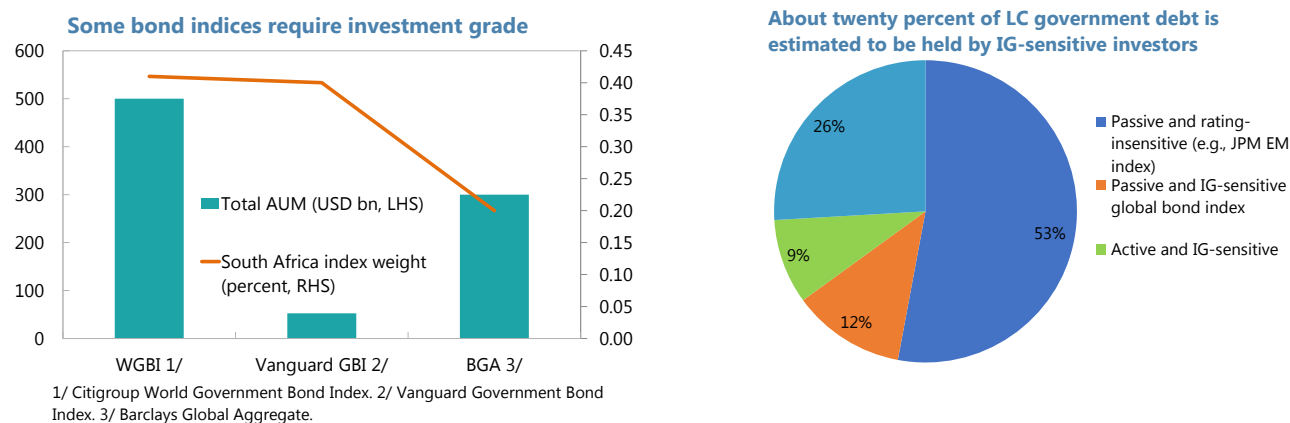
21.   Countries that have lost their FX investment grade rating typically take a long time to regain it. Since 1980, there have been 19 cases of sovereign FX downgrades from investment grade to speculative grade (by at least 2 rating agencies). Out of these 19 cases, 6 sovereigns regained the investment grade ratings after an average of 8 years, the remaining 13 countries have stayed below investment grade, averaging 9 years since the loss of investment grade status.

E.   The Impact of a Local Currency Sovereign Debt Rating Downgrade

22.   LC debt ratings are likely to move with FX ratings. Different rating agencies have different approaches to LC sovereign ratings. While Moody's does not differentiate between LC and FX credit risk and rates both at the same level, Standard & Poor's and Fitch assign higher ratings to South Africa's LC debt. Standard & Poor's rates South Africa's LC sovereign debt two notches above the FX sovereign debt, which is the maximum spread the agency allows. Fitch's LC rating is one notch above the FX rating. If the rating agencies were to downgrade South Africa's FX rating, LC ratings would likely

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[11] The study also showed that nonresident holders of South Africa's LC bonds are primarily institutional investors. These investors typically take longer to return after a downgrade to sub-IG level. See IMF, (2014), Global Financial Stability Report, April "How Do Changes in the Investor base and financial-deepening affect emerging market economies?"

be downgraded too, but may still remain investment grade. Unlike in the case of the FX debt, at the moment financial markets do not appear to be pricing in a downgrade of South Africa's LC sovereign rating below IG level. The analysis below discusses the potential effects of a LC sovereign credit downgrade to sub-IG status, which is not in staff's baseline, as a hypothetical exercise to better understand the downside risk.
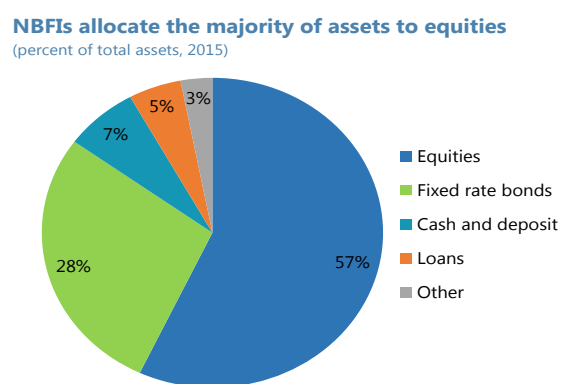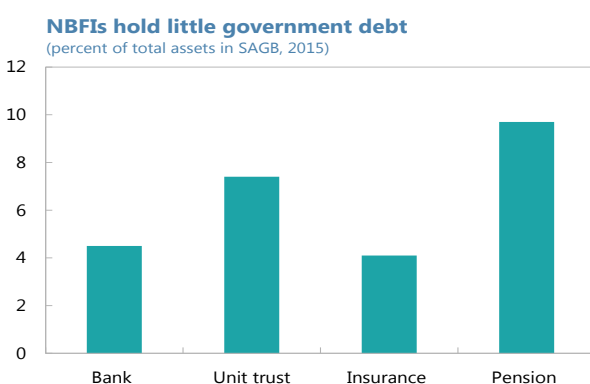
Some bond indices require investment grade

Total AUM (USD bn, LHS)

South Africa index weight (percent, RHS)

1/ Citigroup World Government Bond Index. 2/ Vanguard Government Bond Index. 3/ Barclays Global Aggregate.

About twenty percent of LC government debt is estimated to be held by IG-sensitive investors

- Passive and rating-insensitive (e.g., JPM EM index)
- Passive and IG-sensitive global bond index
- Active and IG-sensitive

Sources: Bloomberg and staff estimates.

23.   A LC sovereign rating downgrade to sub-IG status would likely trigger sizable capital outflows due to forced bond sales. To examine the rating sensitivity of nonresident investors, we explored the Bloomberg bond ownership database compiled from the quarterly regulatory disclosure of institutional investors' asset holdings at the instrument level. In particular, we examined, as an example, the mandates of nonresident holders of two benchmark LC sovereign bonds, the 5- and 7-year bonds, in which foreign holdings account for more than half of the outstanding amount and foreign holding of these two bonds accounts for 13 percent of total foreign holding of LC sovereign fixed-rate bonds. The data show that more than half of the nonresident investors of these bonds follow JP Morgan's Emerging Market Bond Index (GBI-EM), which does not require IG credit rating. However, 21 percent of nonresident investors are IG rating-sensitive due to either index restrictions or their investment mandates. Some popular LC bond indices, such as Citigroup's World Government Bond Index (WGBI), Vanguard's International Bond Index, and Barclays Global Aggregate, require LC IG ratings, as do some discretionary mutual funds for most of their assets. For example, some bonds funds require 80 percent of their investments in IG-rated bonds. We estimate that nonresidents' total forced sales could amount to about 2½ percent of GDP. Other investors might also choose to sell their bonds in anticipation of price declines caused by expected forced sales. Hence, the above estimates may represent a lower bound of possible bond sales related to the LC sovereign rating downgrade to speculative grade.[12] Also, historically equity flows have displayed a high correlation with bond flows in times of stress.

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[12] It is very rare that any South Africa company can be rated above the sovereign rating of South Africa. To the best of our knowledge, only one company currently has a rating above the sovereign.

24. **NBFIs have the balance sheet to absorb the government bonds sold by the nonresidents, but with potential side effects on banks' liquidity.** NBFIs, who held total assets of 210 percent of GDP in 2015 of which less than 10 percent are local government bonds, could provide a backstop to foreign bond sales and absorb new issuance. However, as NBFIs' assets comprise mainly domestic equities and banks' NCDs, the ensuing portfolio rebalancing to increase government bond allocations could lead to asset price declines and reduced funding for banks. A decline in the NBFIs' demand for banks' NCDs, together with regulatory requirements, could lead to liquidity tightening and a significant rise in funding costs for banks, as illustrated by the jump in short-term rates observed during market turmoil episodes in August and December of 2015.

25. **A liquidity squeeze could happen even in the "closed rand system".** Many argue that capital controls on residents combined with the floating exchange rate ensure that there is a "closed rand system", i.e. that rand liquidity remains in the system. But when there are capital outflows, e.g. in case of foreigners selling LC bonds, banks may need to provide funding for NBFIs to switch from NCDs to government bonds. One such way is for banks to buy back NCDs from NBFIs. Banks would then have to find liquidity to buy back NCDs by selling other assets. In addition, market demand for short-term liquidity tends to rise significantly in periods of high risk aversion, and banks will then have to raise term funding to meet LCR requirements under unfavorable market conditions. Though the SARB can intervene to provide liquidity, banks may be limited by the availability of eligible collateral. Also in a more severe capital outflow shock, banks could face medium-term liquidity challenges if NBFIs reduce their bank exposure as part of their portfolio rebalancing and corporates reduce bank deposits when their profitability suffers. Following these unfavorable liquidity conditions, banks may respond by retrenching credit to restore their LCR ratios and pass on the higher funding costs to their customers, which will lead to overall significantly tighter financial conditions and lower growth, even if all agents in the economy ultimately get funding.

NBFIs hold little government debt
(percent of total assets in SAGB, 2015)

NBFIs allocate the majority of assets to equities
(percent of total assets, 2015)

Sources: SARB and FSB**.**

26. **It may take significant price adjustments and rand depreciation for NBFIs to backstop foreign sales of government bonds**. NBFIs' relative low holdings of government bonds could reflect a preference for other higher-yielding investment instruments. There is no minimum requirement for NBFIs to hold government bonds in South Africa. In turn, given the structure of financial holding companies, NBFIs' funding to banks could also be relationship-driven, as insurers and collective

investment schemes (CIS) tend to hold bank paper issued by their connected banks. During the market turmoil in August and December 2015, NBFIs did not substantially increase their purchase of government bonds despite the large jump in bond yields. In addition, mandatory capital repatriation resulting from breaching prudential regulatory limits on overseas asset holdings is uncertain. NBFIs' overall foreign asset holdings (15 percent on average) are still below the regulatory ceiling, though some large private nonfinancial institutions are reported to be at the limit. When the limit on overseas asset holdings is breached, NBFIs can no longer increase their offshore allocation, but have one year to repatriate funds, suggesting that the stabilizing role of capital repatriation might not be immediate. Therefore, it might take significant bond price adjustments and rand depreciation for NBFIs to substantially increase the allocations to government bonds via portfolio rebalancing.

Share of Foreign Assets in NBFIs' Portfolios and Prudential Limits

	Asset Under Management (ZAR trn)	Percent of offshore assets in total assets	Offshore limits, percent of total assets 1/
Collective investment Schemes	2	20	30
Pension Funds (FSB-registered)	2.5	19	25
Life Insurance Companies	1.8	14	30

Source: Financial Services Board.
Note: Assets under management cannot be added up due to overlapping ownership.
1/ An additional 5 percent of total assets is allowed for investment in the rest of Africa.

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