



SOUTH AFRICA

SELECTED ISSUES PAPER

December 2014

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SOUTH AFRICA

SELECTED ISSUES

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Approved By
African Department

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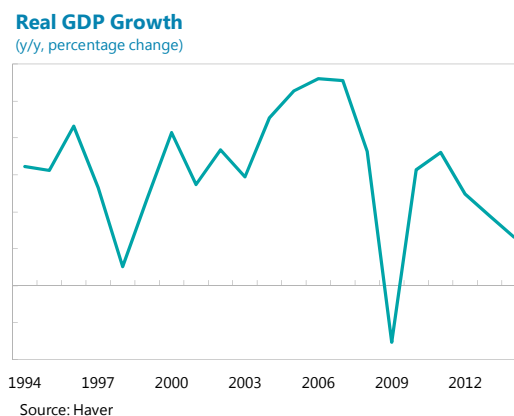
ESTIMATING SOUTH AFRICA'S POTENTIAL GROWTH¹

This paper estimates the potential growth rate for South Africa using several methodologies. In line with existing studies and findings for other emerging markets, it finds that South Africa's potential growth rate has declined in the post global financial crisis period. Though there is substantial uncertainty, South Africa's potential growth is estimated to have fallen from an average of 3½-4 percent during 2000-08 to 2¾-2½ percent in 2010-14, implying that the output gap in 2014 would be between -0.5 to -1.3 percent of GDP.

A. Context

1. South Africa's real GDP growth has declined after the 2008/09 global financial crisis compared with pre-crisis levels.

Growth declined from an average of 4.2 percent over 2000-08 to 2.8 percent over 2010-13, has been weakening in the past 2 years, and is projected to slow further in 2014. This raises a natural question on whether South Africa's potential growth rate has also declined. This question is important to assess the extent of slack in the economy and the appropriate monetary and fiscal policy stance, and warrants an updated study of South Africa's potential growth.



2. Existing studies point to a decline in South Africa's potential growth in recent years. Klein (2011), using various filters as well as the production function approach, finds that South Africa's potential growth rate has declined from an average of 3.2 percent during 1994-2010 to 1.7 percent in 2010 (see summary of related studies in Table 1). Ehlers et al. (2013) also estimates South Africa's potential growth using multiple methods, and finds that the potential growth has declined from an average of 3.9 percent during 2000-2007 to 2.9 percent over 2009-11. The most recent Medium Term Budget Policy Statement points to a potential well above 3 percent². Kemp (2014) and Tsounta (2014) estimate the current potential growth rate at about 2.5 and 2.8-3.2 percent, respectively. In its March 2014 Monetary Policy Committee

¹ Prepared by Yi Wu.

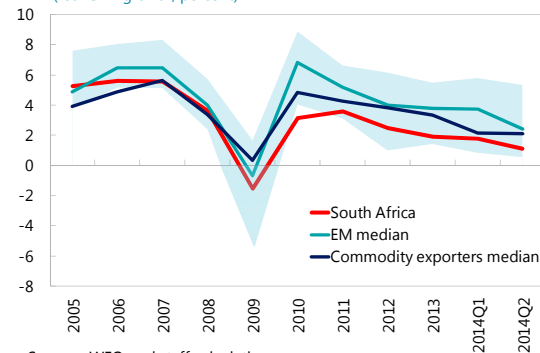
² National Treasury, October 2014, "While growth is expected to reach 3 per cent in 2017, this is well below the country's potential."

Statement, the South African Reserve Bank (SARB) suggested potential growth is in the range of 3.0-3.5 percent, but in a recent speech Governor Kganyago noted that it could be lower.³

3. Growth in many other emerging market countries have also slowed down in recent years. This suggests potential growth may have also declined in these countries (see IMF 2014a, 2014b). Tsounta (2014) attributes the slowdown equally to structural and cyclical factors across countries.⁴ However, the growth decline in South Africa seems to be more profound than in other emerging markets.

4. This study estimates South Africa's potential growth rate using several methodologies. Our preliminary analysis also suggests that potential growth has declined from an average of 3½-4 percent during 2000-08 to about 2¼-2½ percent over 2010-14, implying an output gap for 2014 of between -0.5 and -1.3 percent of GDP. There are, however, large uncertainties associated with such estimates. In addition, our analysis has focused on output in assessing the slack of the economy and it would also be important to assess the functioning of the labor market (Yellen, 2014), which is particularly challenging in South Africa given its high structural unemployment (more than 20 percent).

South Africa's Growth Has Underperformed Peers 1/
(real GDP growth, percent)



Sources: WEO and staff calculations

1/ The light blue area represents the three center quintiles for other EMs.

B. Estimating Potential Growth

B.1. HP filter

5. Not surprisingly, the standard HP filter suggests that potential growth slowed to about 2 percent in 2014. The estimate uses quarterly data from 1994 to 2016 (with $\lambda=1600$), where growth projections for 2014-16 are also included to help alleviate the end-point problem (Figure 1). Average potential growth is estimated to have declined from an average of 3.8 percent during 2000-08 to 2.2 percent during 2010-14. The output gap in 2014 is estimated to be -0.5 percent of GDP. Repeating the exercise using data up to 2015 yields similar results. HP is a simple univariate filter, hence the fact that growth has fallen in recent

³Kganyago, (September 2014): "For many years we took the view that the economy's potential growth rate hovered somewhere around 4 percent. This was optimistic. Our current estimates suggest that it could be considerably lower, in part because we overestimated historical growth and in part because of the effects of the economic slowdown."

⁴Leigh et al. (2014) suggests that the decline in the contribution of total factor productivity to growth is largely responsible for the slowdown in trend growth in many small middle-income countries in sub-Saharan Africa.

years is bound to result in lower potential. While it provides a useful benchmark, a more structural or multivariate approach would be more enlightening.

B.2. Production function approach

6. The production function approach is widely used and offers a richer framework to assess potential growth. Following common practice we assume the production function for the economy is Cobb-Douglas

$$Y = A * (KZ)^{0.53} * (LH)^{0.47},$$

- where Y is real GDP, A is total factor productivity (TFP), K is the capital stock, and Z is the capital utilization ratio, for which we use the capital utilization ratio of the manufacturing sector as a proxy,⁵ L is total working days of the whole labor force, and H is human capital.
- The data for GDP, the capital stock, and utilization are from Haver, and data for human capital are from the Penn World Table. The human capital measure is a function of years of schooling and is from the Penn World Table up to 2010, and for 2011-15 it is assumed to grow at the same rate per year as in 2006-10 (0.38 percent). The share for labor input, 0.47, is the average share of labor income to GDP over 1994-2013.

In addition,

$$L = WAP * LPR * (1 - U) * 261 - LW,$$

- where WAP is the working age population, LPR is the labor participation rate, U is the unemployment rate, 261 is the average number of working days per year, LW is total working days lost due to strikes, calculated as the product of number of workers on strike and days of strike.
- Working age population data are from the UN, which is only available at 5-year intervals and interpolated for other years (including projections). Labor force data since 2000 are from Statistics South Africa and for earlier years imputed using data from the SARB. Unemployment data are from Haver, and days of strikes are from Levy (2014).
- Total factor productivity is then obtained as the residual using the production function. The analysis is conducted using annual data.

⁵ Although the capital stock of the manufacturing sector accounted for 11 percent of the total capital stock in 2013, this is the only sector for which capital utilization data are available.

7. Projections are needed for each component for 2014-15 to avoid the end-point bias.

- The capital stock is assumed to grow at 3.4% per year (which is the average growth over 2004-13⁶).
- Capital utilization rate for 2014-15 is assumed to stay the same as in 2013 (81.5 percent).
- The labor force is projected to follow the recent trend of decelerating growth. The unemployment rate is projected to be 25.2 percent for 2014 and 2015 (forecast based on Okun's Law).
- Total lost working days due to strikes up to September 2014 is used for the year. For 2015, total working days lost due to strikes are assumed to be the same as the 2012-14 average. Both assumptions imply some normalization in labor relations.
- Productivity for 2014/15 is then derived as the residual based on projected GDP.

8. Growth decomposition shows that total factor productivity has declined markedly during 2012-14 (Figure 2). The decline in TFP accounts for the bulk of the growth decline since 2012, which could be partially attributed to increasing electricity constraints and rising days lost to strikes. In contrast, the growth collapse in 2009 was mostly driven by lower capital utilization and rising unemployment. Both capital stock growth and capital utilization were high before the global financial crisis. While both have subsequently declined, the growth of the capital stock remained relatively elevated, underpinned by public investment, by historical standards and the capital utilization rate has also recovered to historical levels prevailing before the 2004-08 spike.

9. Using the production function approach, potential growth is estimated to have declined to about 2½ percent in 2013/14. HP filtered values for the following components are used to derive potential output: productivity, the capital utilization ratio, the labor participation rate, the unemployment rate, days lost due to strikes, and human capital. In contrast, and as standard in the literature, actual values for the working age population and the capital stock are used (see, e.g., Sun 2010 and Barrera et al. 2009). Potential growth is estimated to have declined from 3½ percent during 2003-2008 to 2½ percent during 2010-14 (Figure 1). The output gap for 2014 is estimated to be -1¼ percent of GDP, which is the output gap used in the calculation of the Taylor-rule implied monetary policy rate cited in the staff report. Finally, a decomposition of potential growth suggests that the post-crisis decline has

⁶ The average growth over 2010-13 is 3.3 percent.

been mainly due to lower productivity growth, although lower growth of labor input also played a role (Figure 2).

10. The estimate for the current potential growth rate is robust to changes in specifications. In one of the robustness checks, we dropped the capital utilization ratio and instead used HP filtered capital stock in the calculation. Although this produces potential growth rates and output gaps that are rather different in some past years (in particular in 2008), the estimates for 2013/14 are close (potential growth at 2.5 percent). Adding projection data up to 2016 in filtering also produces similar results. The strong potential GDP growth in 2008 is somewhat surprising, but is driven by the high capital stock growth in 2008 (Figure 2), as actual capital stock is used in deriving potential growth. Indeed, most of the differences between the results from the production-function approach and the HP filter can be attributed to the former's using actual capital stock.

B.3. Multivariate filter

11. Using multivariate filters to estimate potential growth could yield more robust estimates. A univariate filter such as HP, while very easy to implement, is not necessarily consistent with the definition of potential output, and also suffers from important end-of-sample problems. In recent years, researchers have increasingly used multivariate filters to estimate potential output. For example, Borio et al. (2013) show that including information about the financial cycle can yield measures of potential output and output gaps that are more precise and robust in real time. Kemp (2014) estimates potential output for South Africa using multivariate filters that take into account imbalances in financial markets.

12. This analysis uses a multivariate filter based on Laxton et al. (2014) that takes into account inflation. The filter is based on a small macroeconomic model that incorporates a Philips Curve and is consistent with Okun's concept of potential: "...maximum production without inflationary pressure..." The estimate also utilizes inflation and growth expectations to help pin down potential growth and alleviates the end-of-sample problem. Benes et al. (2010) finds that such an estimate is more robust to incorporating new data than the HP filter.

13. The multivariate filter also points to a decline in South Africa's potential growth. The estimate suggests potential growth has declined from 3.9 percent during 2003-08 to 2.4 percent in 2013/14 (Figure 2). The output gap stands at -1.0 percent of GDP in 2014.

14. Current estimates suggest that an important share of the growth slowdown after the 2008/09 crisis can be attributed to

structural factors. The exact share, however, differs depending on the methodology. Using the HP and multivariate filter, the decline is mostly structural (90 percent), while using the

production approach only about half of the decline is structural. This is because the production

	Growth decline			
	Actual	Potential		
		HP	Production function	Multivariate filter
2000-08	4.2	3.8	3.5	3.9
2010-14	2.6	2.2	2.5	2.4
Decline	1.7	1.6	1.0	1.5

approach yields a lower potential growth rate for 2000-08, as it treats the high capital utilization ratio during 2004-08 (Figure 2) mostly as cyclical. In contrast, the growth decline between 2011 and 2013 has been mainly cyclical, as found in IMF (2013).

15. Lower potential growth also has important implications for employment. We estimate the employment-growth elasticity for South Africa following IMF (2012). The elasticity estimated varies across different specifications (OLS vs. instrument variable regression, with or without lags). Using the average elasticity, a one percent growth in GDP would raise employment by 0.7 percent. If the economy grows at the current potential level of 2½ percent, only 1.7 million jobs would be created by 2020, well below the objectives set out in the National Development Plan, with unemployment still in the range of 21-22 percent.⁷

C. Concluding Observations

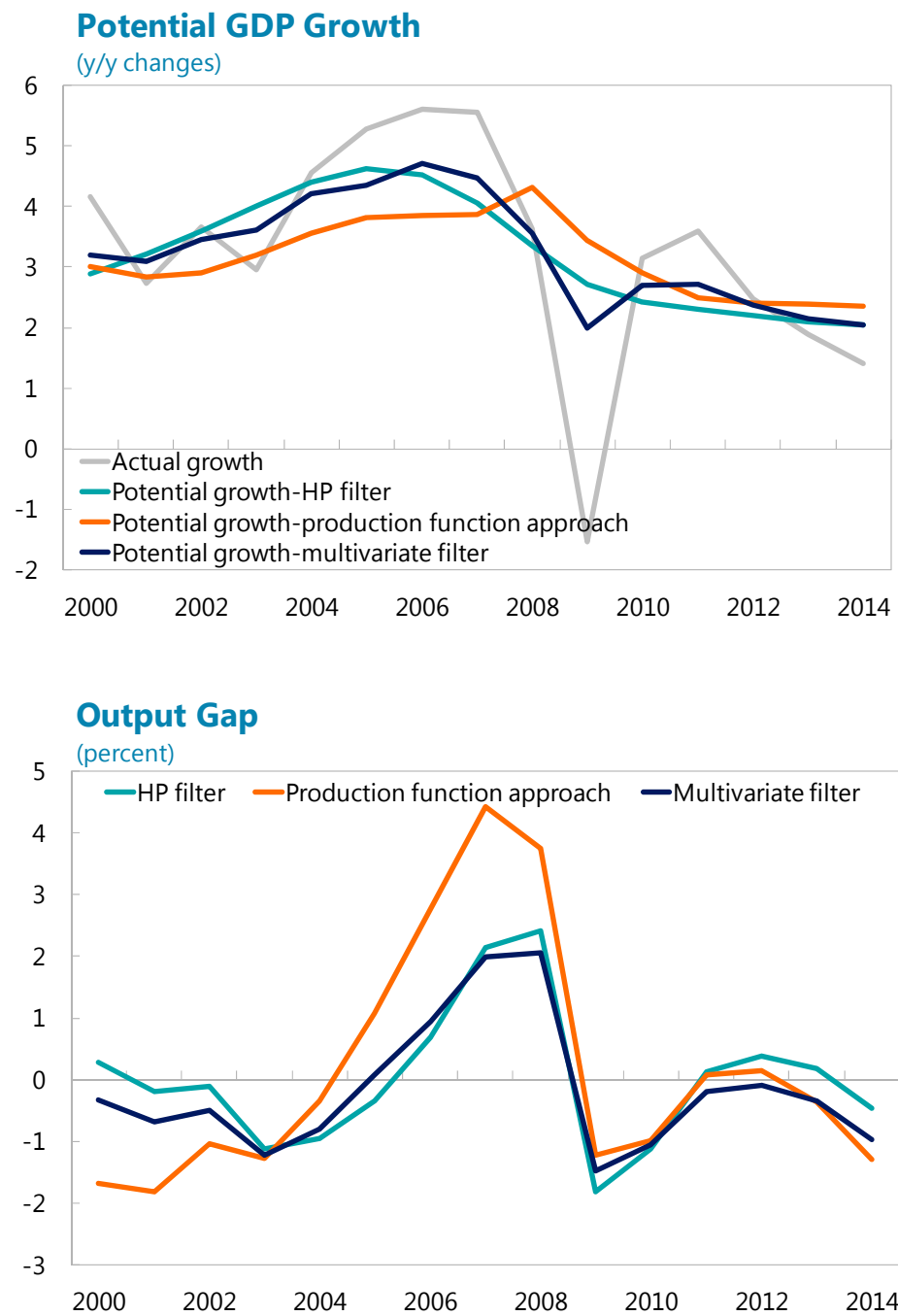
16. Our estimates suggest that South Africa's potential growth has declined post-global financial crisis. Potential growth is estimated to have fallen from an average of 3½-4 percent during 2000-08 to 2¼-2½ percent in 2010-14, implying an output gap between -0.5 to -1.3 percent of GDP in 2014. Structural factors seem to account for the bulk of the decline in actual growth in recent years, with the decline in productivity growth playing an important role in the decline of both the actual and potential growth rates.

17. Uncertainties associated with estimates of potential growth are large. All estimates, even those with structural underpinnings, involve some filtering and require judgment to interpret the findings. In addition, while some methodologies (e.g., the multivariate filter) generally produce more robust results than others, data revisions or inclusion of new data often leads to revisions (sometimes large) to earlier estimates (see, e.g., Kramer and Farrell, 2014). Our estimation results therefore should be taken with caution.

18. An improvement in the electricity supply and other structural reforms would raise South Africa's potential growth. Higher electricity availability would help alleviate electricity constraints. This is anticipated to happen slowly over the next few years because although Eskom's two new large power plants are expected to come on line starting from 2015 and other capacity is being added, other parts of the system will have to be taken off for maintenance on the old system and grid upgrades may take time. Higher energy availability would lead to higher overall production capacity of the whole economy and likely an impact on private investment. Reducing days lost to strikes, and advancing structural reforms, especially in product and labor markets and addressing skill mismatches (see the Article IV consultation staff report for more discussions), would also help reduce structural unemployment and raise potential growth.

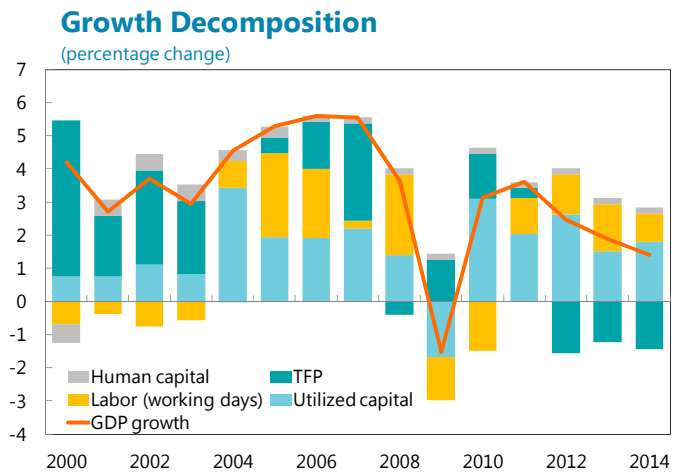
⁷ This is a bit lower than projection based on Okun's Law.

Figure 1. Potential Growth and Output Gap

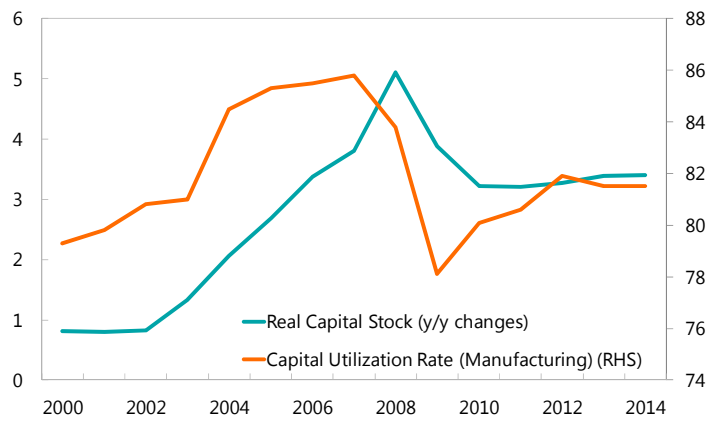


Sources: Haver, UN, and staff calculations.

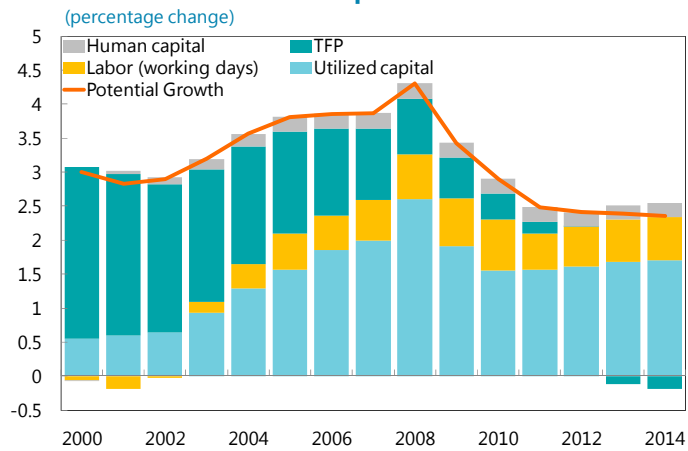
Figure 2. Growth Decomposition



Capital Stock and Utilization



Potential Growth Decomposition



Source: Haver, UN, and staff calculations

Table 1. Selected Estimates of South Africa's Potential Growth

(in percent)

Klein (IMF, 2011)	3.3 (1994-2010); 1.7 (2010)	Average across 7 methodologies including the production function approach and various filters
Ehlers et al. (SARB, 2013)	3.9 (2000-07); 2.9 (2008-11)	Average across 4 methodologies including the production function approach and a multivariate HP
Montalto (Nomura, 2014)	2.3 (2014); 3-3.5 (in the long run)	Production function approach
SARB (2014), March Monetary Policy Statement	3.0 -3.5	
J.P. Morgan (2014)	3.0	
Kemp (Bureau for Economic Research, 2014)	2.5	Extending standard HP filter accounting for imbalances on financial markets
Tsounta (IMF, 2014)	2.8 - 3.2 (average 2013-2017)	Production function approach
Staff's latest estimates		
HP filter	2.1 (2014)	
Production function approach	2.4 (2014)	
Multivariate filter	2.0 (2014)	Multivariate filter accounting for inflation movements

Sources: IMF, SARB, Bureau for Economic Research, J.P. Morgan, and Nomura.

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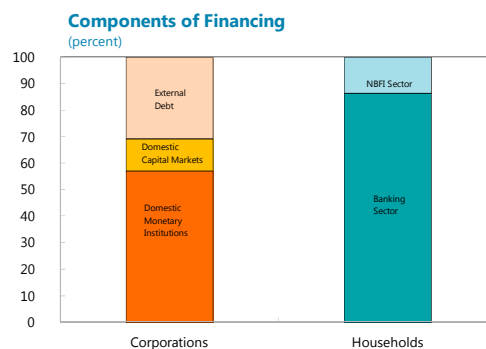
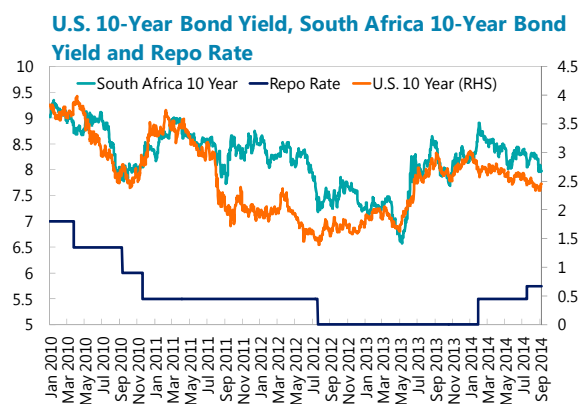
THE IMPACT OF TIGHTER FINANCIAL CONDITIONS ON THE SOUTH AFRICAN ECONOMY¹

Financial conditions in South Africa, though benign so far, have started to tighten, and are likely to continue doing so due to several factors, including the normalization of unconventional monetary policy in key advanced economies, the South African Reserve Bank's normalization, and the implementation of regulatory reforms. This paper explores the evolution of financial conditions in South Africa and the impact on balance sheets and the economy. The impact of tighter financial conditions is likely to fall mainly on households, which are heavily indebted, and affect banks via the credit channel. In addition, the impact of higher interests on aggregate demand is estimated to be non-trivial, falling especially on private consumption.

A. Evolution of Financial Conditions

1. South Africa's long-term interest rates have increased significantly since concerns of Fed tapering started. The Fed's monetary policy announcements were strongly correlated with movements in asset prices and capital inflows in EMs, particularly when the tapering was first discussed (May 2013).² Since then, South Africa's 10-year government bond yield has increased by some 150bps, while U.S. 10-year Treasury bond yield increased by about 85bps. The increase is less when compared to end 2012, as South Africa bond yields dipped in the first few months of 2013. Long-term bond yields have a direct impact on the borrowing costs of the government and state-owned enterprises (SOEs), and to a more limited extent on banks, because long-term bonds account only for 12 percent of their total liabilities. Finally, non-financial long-term corporate bonds only account for about 12 percent of the South African bond market, equivalent to about one-fifth of outstanding corporate loans from banks.

2. Further increases in long-term interest rates are anticipated for all Emerging Markets (EMs), as key advanced economies' central banks proceed with monetary policy normalization. With tapering completed, the Fed is expected to



¹ Prepared by Yibin Mu and Yi Wu.

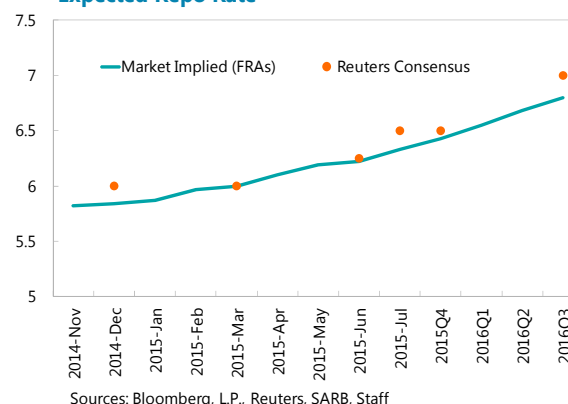
² Ray (2014) finds strong evidence of a global financial cycle.

raise interest rates sometime in 2015. The IMF projects U.S. interest rates somewhat below market expectations.³ The Bank of England is also expected to normalize monetary policy. Although there is uncertainty on the date of lift-off, the speed at which U.S. rates will move, the terminal rate, the reaction of U.S. long-term bond yields, as well as on the degree to which EM bond rates will react, the expectation is clearly for a significant increase over the next few years. Although the European Central Bank and the Bank of Japan are still on an easing course and may further increase bond purchases, they are unlikely to offset the impact of Fed action. The 2014 IMF Spillover Report and the October 2014 WEO conclude that the long-term bond yields of EMs are heavily affected by the U.S. 10-year Treasury bond yields, with the impact being damaging for EMs if the shock results from unexpected monetary tightening. Further, while during the initial periods of acute and systemic market volatility, there is an indiscriminate impact across countries, over time country differentiation typically prevails. In particular, elevated current account deficits, high inflation, weak growth prospects, and relatively low reserves are important factors generating a more adverse market reaction.⁴

3. Although there are some mitigating factors, on balance South Africa long-term bond yields seem likely to increase. South Africa's large domestic institutional investor base could limit the impact on bond yields even when

non-residents sell South African bonds. Further, South Africa's sluggish growth, anchored inflation expectations, and the tightening of fiscal policy announced in the 2014 Medium-Term Budget Policy Statement could reduce the need for policy rate increases and contain the increase in long bond yields. Nevertheless, South Africa displays some of the characteristics identified above that could lead to a sizable increase in its domestic bond yields as major advanced economies normalize their monetary policies. Overall, it seems reasonable to expect an increase in long bond rates in South Africa over the next few years, even though some increase is already priced in.

Expected Repo Rate



4. The policy rate has been the main determinant of lending rates, which matter most for households and corporates. In South Africa, as in many EMs, most domestic debt finance to households and corporates comes from domestic banks. As of 2014Q2, corporate debt was about 59 percent of GDP, of which 57 percent is bank loans. Households borrow nearly 90 percent of their

³ IMF 2014 United States Country Report 14/221 and October 2014 Global Financial Stability Report.

⁴ "Emerging Markets Volatility: Lessons from the Taper Tantrum," IMF Staff Discussion Note 14/09 (Washington: International Monetary Fund).

debt from banks and the remainder mainly from NBFIs. The majority of bank credit is at floating rates, although unsecured credit which accounts for 11.7 per cent of the total gross credit exposure of the banking sector (as of January 2014) is at fixed rates.⁵ Lending rates are the prime rate plus or minus a certain spread. The prime rate, in turn, is the SARB repo rate plus a fixed spread of 350 bps. The SARB has raised policy rates twice in 2014 (50bps in January and 25 bps in July) and market participants expect further increases.

5. The negative spread between the effective lending rate (average actual lending rate⁶) and the prime rate has declined since the global financial crisis. The spread has increased roughly from -2.0 percent in 2008 to -0.5 percent in early 2014, as the global financial crisis induced banks to be more cautious in loan pricing. In addition, the implementation of Basel 2.5 in early 2012 and Basel III in early 2013 has pushed up bank funding costs and has reduced banks' appetite for riskier and longer-term lending.⁷

6. Several factors could entail that financial conditions in South Africa tighten more going forward. Besides the impact of ongoing regulatory reforms (including the future adoption of the net stable funding ratio), the intervention of African Bank in August 2014 and deteriorating asset quality of unsecured loans could make financial institutions more cautious, especially regarding unsecured lending. Indeed, credit to households has decelerated substantially, in particular in the unsecured segment, and bond issuance was considerably reduced in August-September 2014. Also, the recent downgrades of several South African Banks by Moody's are expected to increase banks'

⁵ Unsecured loans are defined as the SARB's unsecured lending to retail counterparties, which includes credit cards, overdrafts, personal loans and financing provided to small and medium enterprises (SMEs) in the retail sector (SARB Financial Stability Review, March 2014).

⁶ Calculated as the weighted average of interest rates of subcomponents.

⁷ Havemann (2014) estimated that in South Africa increasing the counter-cyclical capital buffer by 100 basis points has similar effects to an interest-rate shock of between 30-40 basis points.

Corporate debt in percent of GDP 1/

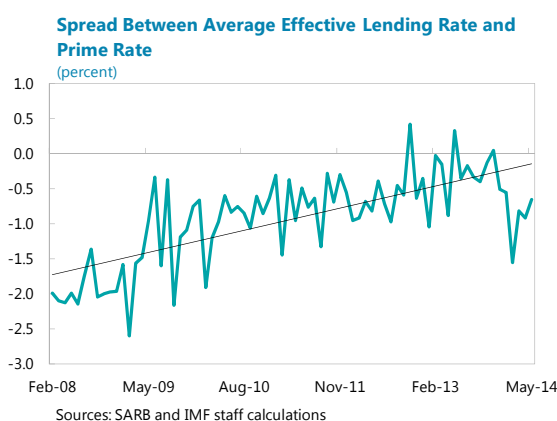
(as of June 2014 unless otherwise indicated)

Credit by all monetary institutions	33%
Foreign debt	18%
Domestic debt securities held by residents 2/	7%
Total	59%

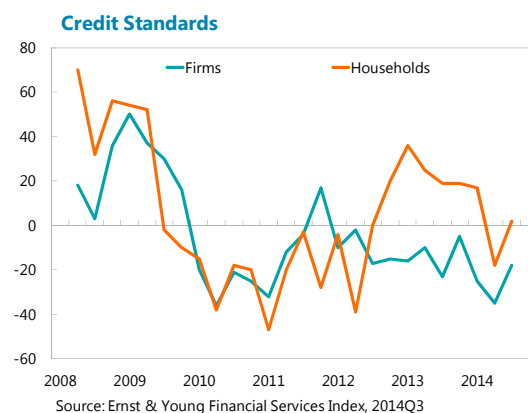
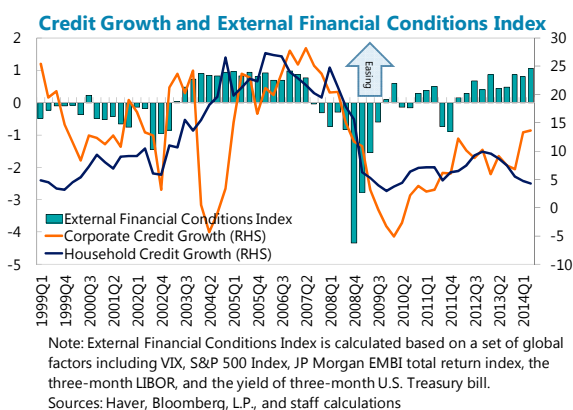
Sources: SARB, BIS, and staff calculations.

1/ GDP is the sum over 2013Q3: 2014Q2.

2/ As of 2014Q1. Calculated as the difference between domestic debt securities (from the BIS) and rand-denominated bonds held by nonresidents.



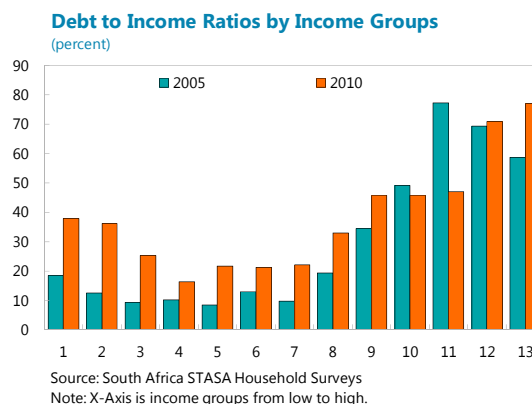
funding costs, which would likely translate into higher credit spreads.⁸ The introduction of affordability guidelines for all lenders is welcome, but could further reduce the flow of credit to households especially from NBFIs. In addition, higher long-term yields could negatively affect the equity market, via a reduced equity risk premium and lower equity issuance. Although the tightening of global and domestic financial conditions may be accompanied by an exchange rate depreciation, which could have an offsetting impact, this channel is somewhat limited in South Africa due to structural constraints.⁹



B. Impact of Higher Interest Rates

B.1. Impact on households' balance sheets

7. Households are vulnerable to rate hikes. Rapid growth in private sector credit between 2003 and 2006 boosted household debt to 83 percent of income in 2008. While the pace of credit growth has slowed sharply recently, household debt at 75 percent of income in 2013 remains high by historical and cross-country standards. The credit quality effects of this high leverage are likely to become apparent only when interest rates rise from historically low levels and the flow of credit diminishes. Households in the lower income groups have increased their leverage more. We estimate that a shock of a 100 bp rate increase is estimated to increase the household interest-only debt service

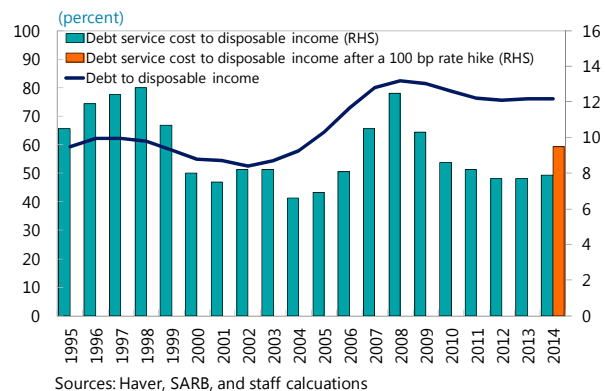


⁸ Moody's downgrade in August 2014 for the top four banks was because of the perceived lower government support, but not because of changes in the stand alone credit ratings of these banks. In addition, Moody's downgraded the top 5 banks in November 2014, following the sovereign downgrade.

⁹ Selected Issues Paper, "South Africa's Export performance: Any Role for Structural Factors?".

ratio to some 9½ percent from the current 7.9 percent of the disposable income, slightly higher than 2002-03 level, when significant household debt distress occurred. Nevertheless, there are some mitigating factors. Mortgages, which are typically at floating rates and at full recourse, are more dominant in higher income households' portfolios. Unsecured lending, which is more dominant in lower income households' portfolios, is at high, but fixed rates. Also, the growth of unsecured lending has decelerated markedly as lending criteria have started to tighten as a result of the authorities' policies, though the maturity of unsecured lending has been extended significantly. Households' net wealth is over 3.5 times disposable income. Households, especially higher income ones, also have sizable assets and have benefited from increases in house and stock prices, though stock valuations are viewed as fairly elevated at present.

Household Debt Burden and Impact of a 100 bp Rate Hike

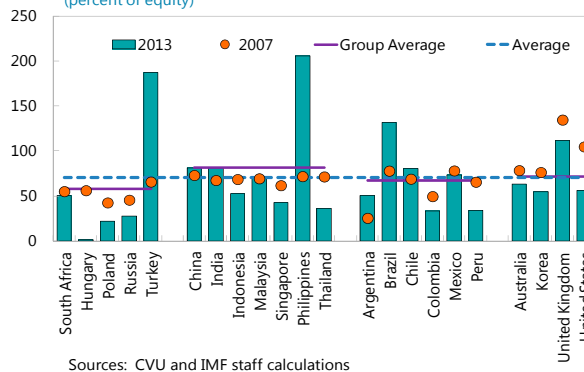


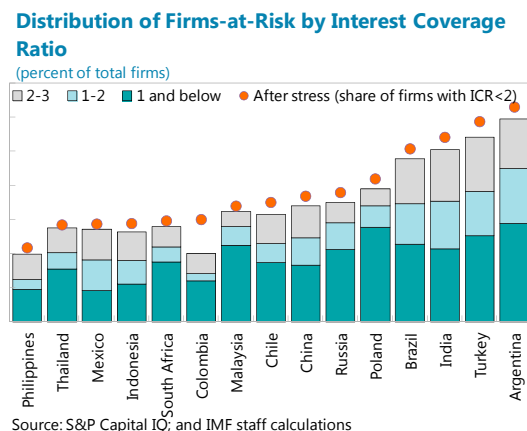
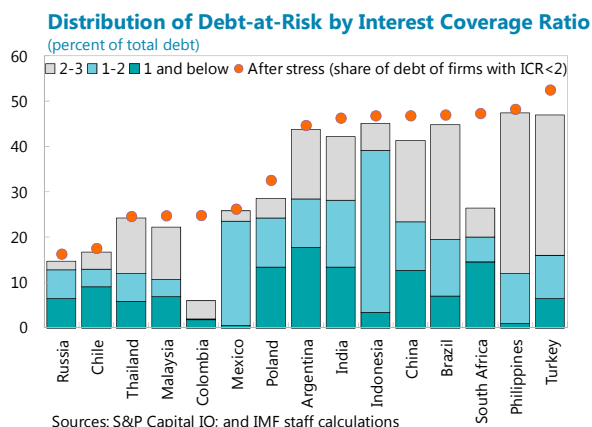
B.2. Impact on corporate balance sheets

8. The impact of higher interest rates on corporates is likely to be modest, but fall more on SOEs.

While private sector firms have kept their leverage low, SOEs have substantially increased their borrowing. South Africa's total corporate debt in percent of GDP reached 59 percent in 2014Q2, mainly driven by borrowing of a few SOEs. A sensitivity analysis of a sample of large and small companies in selected emerging market economies conducted in the spring 2014 GFSR and a similar analysis conducted in the FSSA test the impact of a 25 percent increase in borrowing costs and a 25 percent decline in earnings. Debt at risk—which is the amount of debt of firms with less than two times interest coverage after the shocks—increases from 27 percent to 50 percent of total debt. However, the share of weak firms after the shocks is barely changed in the case of South Africa. The difference is the result of the amount of debt held by a few SOEs. The fact that SOEs' debt is largely hedged should mitigate the impact from tighter financial conditions on SOEs, but nevertheless their funding and hedging costs could rise if financial conditions tighten. Finally, among private firms, SMEs are likely to be more heavily affected by interest rate rises than large private companies, as typically large South African companies have higher profitability (partly due to market power) and better cash flows than small businesses.

Debt
(percent of equity)



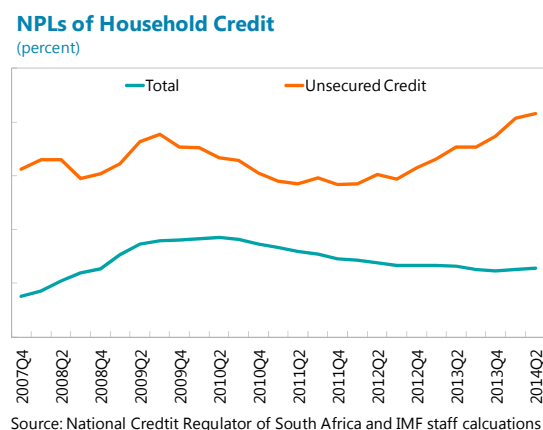


B.3. Impact on banks' balance sheets

9. The recent FSAA bottom-up stress tests concluded that the direct impact of a 100 bp hike on banks' balance sheet would be limited. Interest rate increases of 100 bps on unsecured credit (mortgage portfolios) lead to expected losses of 9.0 (6.2) percent of total capital. The impact is limited mainly because the unsecured lending book combines both floating-rate and fixed-rate loans, reducing the interest pass-through effects of higher rates; and for the large banks, because the customer base comprises high-income professionals and/or government employees whose income and creditworthiness are less likely to be affected by macro downturns.

10. However, the FSAA top-down stress tests, which are scenario-based and include a greater impact via credit quality, show a larger impact of the rate hike. The FSAA severe scenario top-down stress tests show a significant increase in probability of defaults (PDs) from 3.4 percent to 12 percent on floating-rate mortgages, and from 4.4 percent to 19 percent on retail unsecured loans, thus causing a loss of about one quarter of total capital. Hence, the impact of rate hikes on banks' balance sheets is likely to be significantly more marked once the bigger PDs are taken into account.

11. Though the overall nonperforming loan (NPL) ratio is still falling, there are pockets of rising credit stress. The overall NPL ratio stood at 3.5 percent in June 2014 down marginally from 3.6 percent in December 2013. The fall is mainly because banks continue to clear up poor mortgage portfolios from 2006-08 and is attributable to the top 5 banks. However, NPLs of unsecured credit have already increased significantly and so have the NPLs of smaller banks, which the SARB defines as those other than the



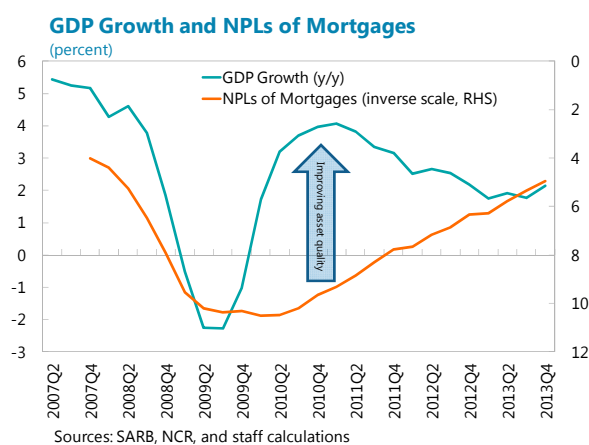
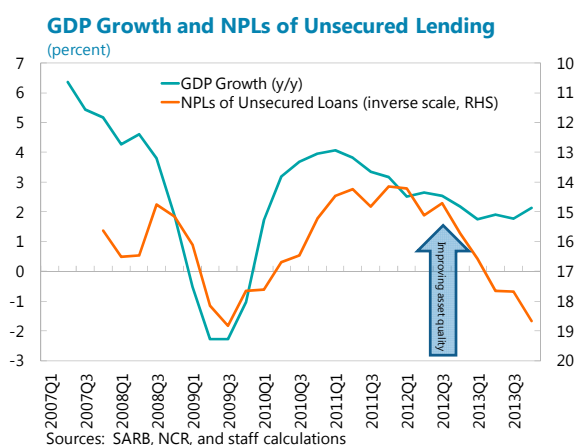
top 5 banks and that account for less than 10 percent of the system.¹⁰

12. Typically, in periods of sluggish growth, higher unemployment, and tighter financial conditions, NPLs start increasing only with a lag. In South Africa, it appears that NPLs of unsecured credit start increasing sooner than NPLs on mortgages. Simple regression results using data from the National Credit Regulator for 2007Q4 to 2014Q2 suggest that NPL ratios of mortgages and unsecured credit are positively correlated with the policy rate with two-quarter lags and unemployment contemporaneously, while inversely correlated with GDP growth with a two-quarter lag. Policy rate increases have a significant impact on the asset quality of mortgage portfolios. The impact of the policy rate on the asset quality of unsecured credit is insignificant though the sign is as expected: this is likely because the interest rate of unsecured credit is high, but capped by the regulator.¹¹

Regression Results

	NPL Ratio of Mortgages	NPL Ratio of Unsecured loans
GDP growth (-2)	-0.665	-1.151**
Unemployment rate	1.577***	0.163
Real wage growth	-0.285	-0.097
Policy rate (-2)	0.570**	0.109
R-squared	0.51	0.32
No. of obs.	27	27

* p<0.1, ** p<0.05, *** p<0.01



B.5. Impact on output and domestic demand

13. The impact of policy rate hikes on output and domestic demand is assessed using a standard vector autoregressive (VAR) model. The vector includes a set of external variables treated as exogenous in the VAR system, including:

- International financial conditions, proxied by the S&P 500 Chicago Board Options Exchange Market Volatility Index (VIX);

¹⁰ See SARB Financial Stability Review, September 2014.

¹¹ Currently, the cap is 32.65 percent.

- External demand, measured by a weighted average of the real GDP of the Euro area, China, and the U.S., with weights equal to their share of South Africa's exports as in the IMF's Global Economic Environment (GEE); and
- A commodity price index measured as the weighted price index of platinum, gold, coal, iron ores, and chromium, with weights equal to their average share of South Africa's exports over 2004-13.

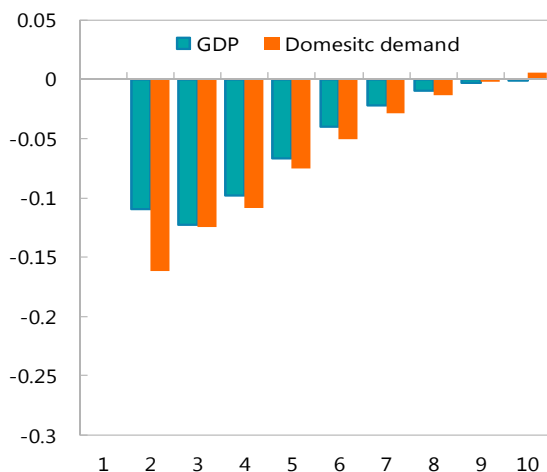
The vector also includes endogenous domestic variables including South Africa's real GDP (which is then replaced by domestic demand, private consumption, or investment in different specifications) and the repo rate. The reduced form errors are orthogonalized by the standard Choleski decomposition with GDP ordered before the repo rate.

14. The model is estimated using quarterly data from 2000:Q1 through 2014:Q2. All the variables are expressed in log levels, and the model is estimated in first differences (except for the VIX and repo rate, which is expressed in levels) using two lags. Augmented Dickey-Fuller unit root tests suggest that all variables are stationary in first differences except for the VIX, which is stationary in levels, and the repo rate. The results for the repo rate are mixed depending on specifications, where the null hypothesis of unit root can be rejected when a trend is included.

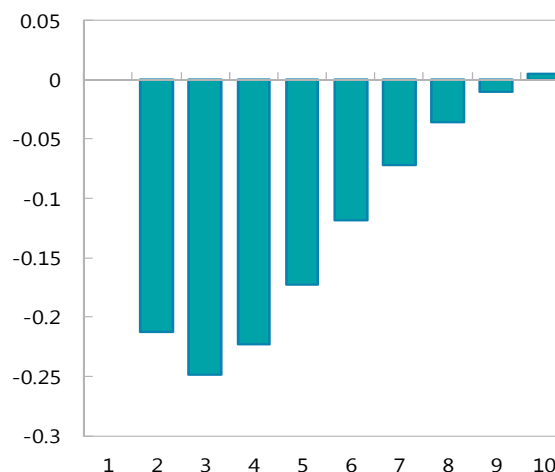
15. Policy rate hikes have a non-trivial impact on growth. Impulse response functions suggest that the impact of a 100 bp hike in the repo rate on q/q GDP growth would peak after 3 quarters at 0.12 percentage points, and dies out in about two years. Output would be lowered by 0.3 percent after one year and 0.5 percent after two years (cumulative). The result is broadly similar to Smal and de Jager (SARB 2001), who finds that GDP would decline by roughly 0.5% after 4-5 quarters, and Standard Bank (2014), but larger than estimates in Gumata et al. (SARB 2013), which finds that GDP growth would be lowered by 0.05 percentage points after one year.

16. The results are broadly similar under alternative specifications. The impact remains similar when credit growth is added as an endogenous variable. The impact would be larger under some alternative specifications (0.6-0.8 percent over two years), e.g., using three lags or treating the external variables as endogenous (which has the advantage of allowing for interactions among them). The impact on domestic demand is similar to that of GDP.

Impact of a 100 bp Repo Rate Hike on q/q GDP and Domestic Demand Growth
(sa, percentage points)



Impact of a 100 bp Hike in the Repo Rate on q/q Private Consumption Growth
(sa, percentage points)



Sources: Haver, Bloomberg, IMF/GEE, and IMF staff calculations

17. Policy rate hikes have important impact on private consumption but seem to have little impact on investment. Private consumption accounts for more than 60 percent of domestic demand or GDP. The impact on q/q private consumption growth from a 100 bp hike in the policy rate would peak after three quarters at 0.25 percentage points, and private consumption would be lowered by 0.7 percent after one year and 1.1 percent after two years (accumulated). In contrast, policy rate has little impact on fixed capital formation (or even positive impact on some specifications though not statistically significant). Although public investment (including investment by public enterprises) may be less sensitive to interest rates, private investment still accounts for the bulk of the investment (about two thirds).

18. Interest rate affects private consumption through multiple channels. We follow Bayoumi and Swiston (2009) in an attempt to identify the transmission channels from the policy rate to private consumption, focusing on the credit and wealth effect channels. The base VAR is augmented by adding credit to the households, and stock and housing prices (all in real terms and in log difference) as exogenous variables. The difference between the impulse responses between the base VAR and the augmented VAR is then used to calculate spillovers through one particular channel. The analysis suggests that the credit channel accounts for only 10 percent of the total impact, and the impact from the asset price channel is negligible. The latter could be partially attributed to the fact that only a small portion of South African households own stocks. This suggests other channels play more important role, in particular the impact on household debt service as discussed earlier, given the high indebtedness of South African households.

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SOUTH AFRICA'S EXPORTS PERFORMANCE: ANY ROLE FOR STRUCTURAL FACTORS?¹

Despite substantial and prolonged exchange rate depreciation, South Africa's exports have continued to be sluggish, with the balance of goods widening to 2.2 percent in 2013. In this study, we focus on exploring the role of structural factors in reducing the responsiveness of exports to the depreciation by using firm level data. The use of firm level data allows us to isolate the impact of sector-specific structural factors on the responsiveness of exports. Our analysis suggests that electricity bottlenecks, limited product market competition, and labor market constraints have reduced the responsiveness of exports to the exchange rate depreciation. On the other hand, a firm's ability to diversify its exports has helped it benefit more from currency movements. We also find that small and medium enterprises (SMEs), exporting mostly manufacturing goods to Sub-Saharan Africa (SSA), are more responsive to exchange rate changes.

A. Context

1. Despite a prolonged and substantive depreciation of the rand, South Africa's export performance remains weak. In a group of 20 emerging market peers, South Africa's real effective exchange rate (REER) witnessed one of the longest – and the third largest – depreciation spells during January 2011 – July 2014, with its REER depreciating by around 25 percent in that period (Figure 1). Notwithstanding this real depreciation, South African exports have grown at an average 4.3 percent during 2011-14, with a turning point in 2013Q3. During the same period, relatively inelastic imports—partly because they are required for the large infrastructure projects—have resulted in the widening of the current account deficit to 5.8 percent of GDP in 2013 from 2.3 percent of GDP in 2011.

2. Binding structural constraints may be one of the reasons behind South Africa's poor exports performance. It has been argued that a weaker external demand, coupled with softer commodity prices have resulted in weak performance of South African exports.² However, even if the terms of trade remained at 2010 levels, South Africa's deficit in the balance of goods in 2014 would have been sizeable at around 2 percent of GDP. Moreover, South Africa's exports growth has averaged around 82 percent of its trading partners' imports growth during 2011-14—one of the lowest proportions among peers (Figure 2), with its share of global exports falling by nearly 15 percent. Some consider that large capital inflows and the concomitant real exchange rate appreciation especially in 2009–10 eroded the competitiveness of South African firms and forced them out of the market. Others argue that high margins in product markets and wages in labor

¹ Prepared by Rahul Anand, Roberto Perrelli, and Boyang Zhang.

² For example, in its *Quarterly Bulletin* of September 2014, the South African Reserve Bank cites that "South Africa's export performance in the second quarter of 2014 was inhibited by the prolonged industrial action, logistical and energy constraints, a moderation in global demand, and a decline in some commodity prices."

markets have resulted in uncompetitive domestic costs of production, eroding external competitiveness. Also, in the last few years, supply constraints, such as availability of electrical power and production disruptions due to strike activities, have become more binding, hurting production and hence exports. Edwards and Garlick (2008) find that South African exports are not demand constraint but supply constrained, by factors such as infrastructure.

3. Studies have found varying results for the elasticity of exports. Behar and Edwards (2004) use vector error correction models to estimate long-run elasticities for South Africa's manufactured goods during 1975-2000. After controlling for competitors' export prices in the VECM, the authors find the elasticity of manufacturing exports to be between -3 to -6. On the other hand, Edwards and Lawrence (2006) find the elasticity of manufacturing exports to be smaller, between -1.3 and -1.6, after controlling for tariff rates during 1970-2004. Golub and Ceglowski (2002) find even smaller price elasticities, between -0.8 and -1.4, using alternative indicators of relative prices during 1970-1998. Using 1960-2005 data, Narayan and Narayan (2010) find that the long-run elasticity of South African exports to [the exchange rate] is not statistically significant, and that the Marshall-Lerner condition does not hold for the country.

4. Our study uses firm level data to explore the role of structural factors in determining the responsiveness of exports to the rand depreciation. Previous studies estimating the elasticity of exports have used pre-global financial crisis years, and do not control for firm and sectoral characteristics in a panel framework. In this paper, we use firm level data to study the role of structural constraints in affecting the responsiveness of exports to the REER changes. Using firm level data allows us to isolate the impact of sector-specific factors on REER responsiveness, as macroeconomic conditions remain the same for all firms in the economy. Also, we can disentangle the differential responsiveness of sectors to the depreciation and other macroeconomic shocks, controlling for sector-specific external demand. We first examine the responsiveness of export transactions to REER movements and external demand growth across companies in the two main sectors of the South African economy, mining and manufacturing. Next, we assess how a set of proxies for structural constraints—more specifically, electricity gaps, labor market and product market rigidities—has affected firms' export performance since 2010.

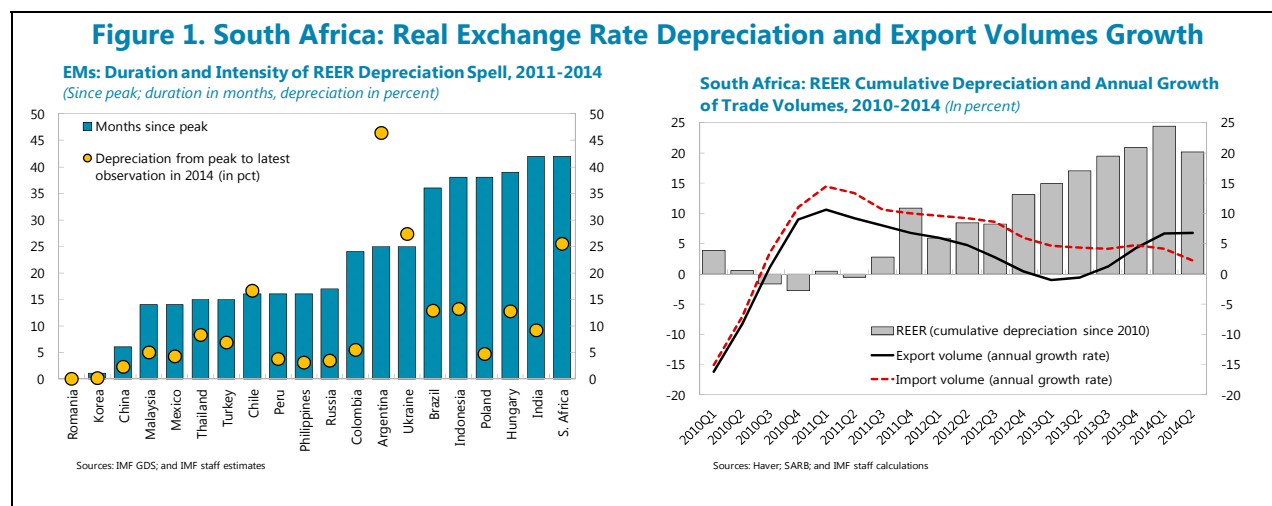
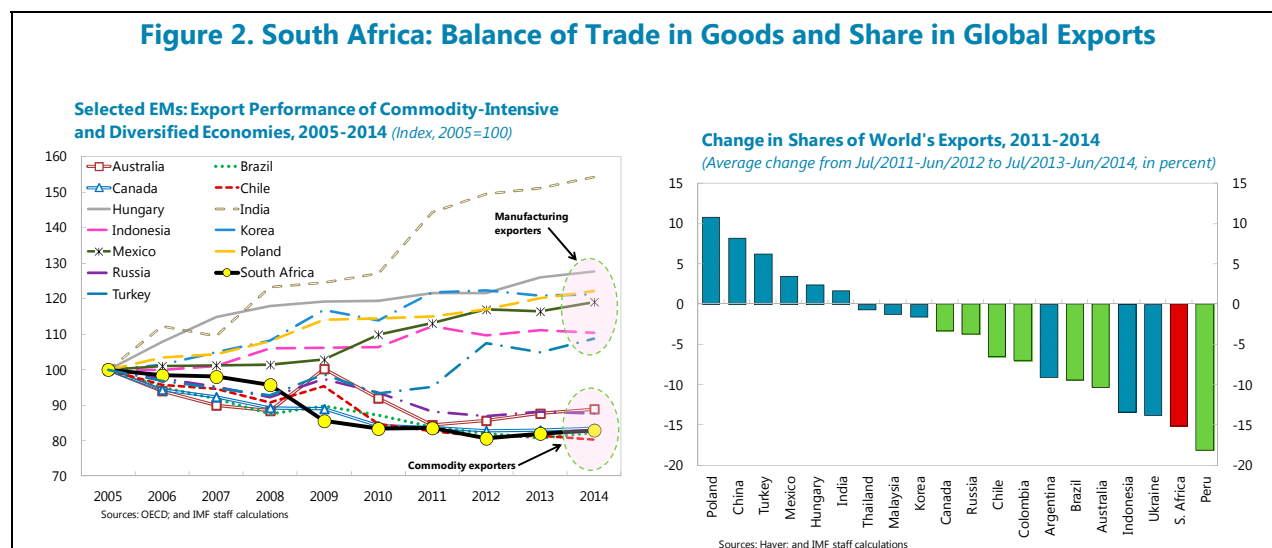


Figure 2. South Africa: Balance of Trade in Goods and Share in Global Exports

B. Strategy to Explore the Role of Structural Constraints

B.1. Firm-level and sectoral data

5. We use a unique database that enables us to examine the impact of relative prices and structural constraints at the firm level. Data on monthly exports were provided by the South African Revenues Service, covering the period from January 2010 to February 2014, and including a total of sixty thousand reporting firms in 2013. The database includes information on the type of product exported, the destination of each export transaction, the currency of the transaction, and whether each reporting firm was active at each point in time. We supplement this information with trade flows for 99 sub-sectors of the economy, as provided by the UN Comtrade database via the World Integrated Trade Solution (WITS) platform. The information on relative prices (real effective exchange rate, unit labor costs, and terms of trade) was obtained from the South African Reserve Bank (SARB), while the sector-specific external demand was computed by the authors using data from the IMF's World Economic Outlook (WEO). Data on electricity consumption is taken from Statistics South Africa. The concentration and diversification indices were computed using the firm level data, while the information on days lost due to strikes was based on various industrial action annual reports.

6. The micro level data reveals that small and medium sized companies are manufacturing-intensive, and export primarily to Sub-Saharan Africa. More than 85 percent of the goods exported by small and medium size enterprises (SMEs) are manufactured products, while almost half of large companies' exports are mining products (Figure 3). Also, over 90 percent of SMEs' exports are shipped to Sub-Saharan Africa, while export destinations are more evenly distributed in the case of large firms (Figure 4). However, the size of SME sector remains small, with large firms accounting for nearly 93 percent of total export revenues in the sample period. This is in line with the World Bank study, which found that while a few super-exporters dominate South Africa's trade, they have underutilized the country's large pool of unskilled workers, "thus failing to

create enough jobs to make the export sector a major direct contributor to employment growth and poverty reduction” (Purfield and Farole, 2014).

Figure 3. South Africa: Exported Products by Firm Size, 2010-2014

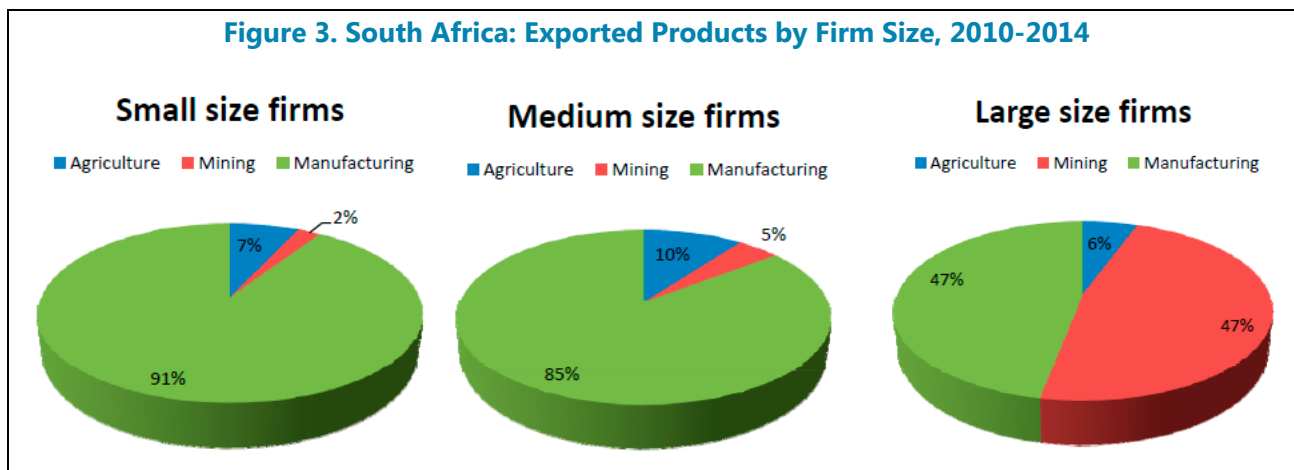
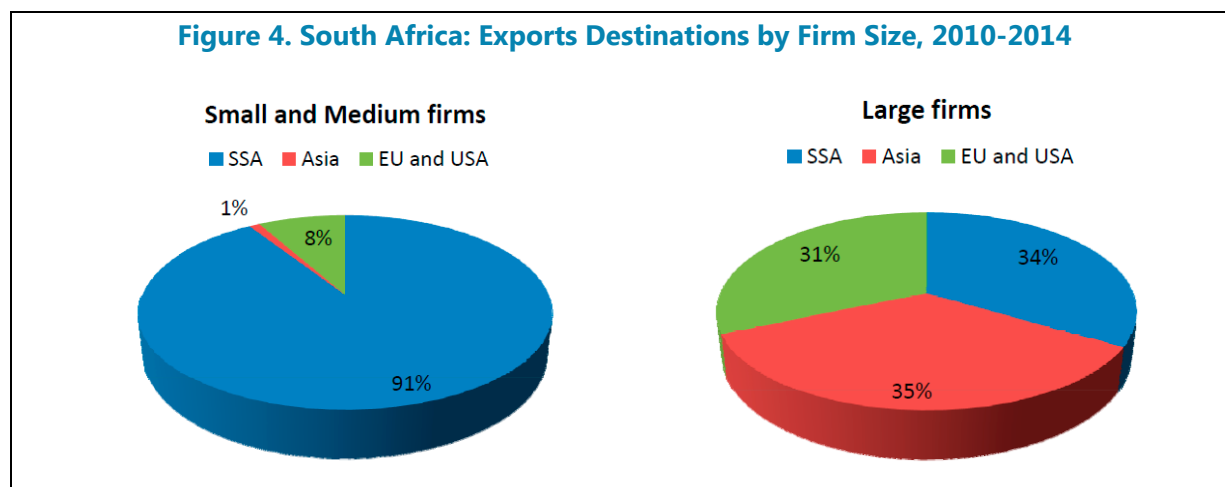


Figure 4. South Africa: Exports Destinations by Firm Size, 2010-2014



7. On the other hand, large firms have a much higher probability of continuing in business than SMEs, and they account for the bulk of South Africa’s exports. The micro-level database allows us to estimate a transition probability matrix of export flows by firm size. The results show stark differences between small and large firms. Nearly one quarter of currently active small firms are likely to become inactive (temporarily or otherwise) the following year. Also, the probability that a small firm will grow to become large in the following period is miniscule. Conversely, very few active large firms are likely to become inactive in the next period or become small (Table 1). This may reflect product market rigidities that negatively affect the operation of SMEs.

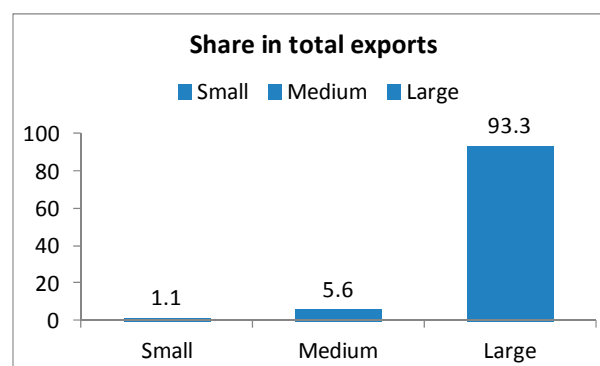


Table 1. Firm Size and Transition Probability Matrix, 2010-2014

Transition Matrix					
	Inactive	Small	Medium	Large	Total
Inactive	57.5	40.2	2.1	0.2	100
Small	26	68.3	5.5	0.1	100
Medium	4.6	19	70.6	5.8	100
Large	1.5	1.6	11.5	85.4	100

8. To capture the impact of structural rigidities on exports, we construct indicators of structural constraints pertaining to the supply of electricity, the concentration of product markets, and the rigidity of labor markets. We design variables that vary across sectors and over time. To capture electricity constraints, we construct a measure of the electricity gap, defined as the ratio of electricity consumption to production multiplied by the electricity intensity of the sector. The underlying idea is that higher demand relative to supply represents the electricity shortage and a sector with higher electricity intensity is more affected by this shortage. Product market concentration is proxied by the traditional Herfindahl index (Table 3). To capture labor market issues, we use the number of strike days per thousand workers multiplied by the unionization rate.

Table 2. Export Market Concentration by Sub-Sector of Production

Sector	Export share	Export market concentration (measured by Herfindahl index)
Organic Chemicals	1.4	0.64
Aluminium And Articles	2.0	0.38
Precious Metals	20.8	0.24
Ores	13.0	0.23
Plastics	1.5	0.14
Vehicles	8.6	0.11
Cereals	0.9	0.11
Iron and Steel	7.5	0.08
Inorganic Chemicals	1.2	0.08
Mineral fuels	10.7	0.08
Beverages	1.4	0.06
Miscellaneous Chemicals	0.9	0.05
Machinery	6.9	0.02
Fruits and Nuts	2.4	0.02
Articles of Iron and Steel	1.7	0.01
Electrical Machinery	2.3	0.01

Note: Herfindahl index (HI) above 0.2 is considered highly concentrated. HI here is the average for 2010-2013.

↓ decreasing concentration

B.2. Econometric Methodology

9. In the first part of our study, we estimate the short- and long-run responses of export revenues to REER changes in a panel of heterogeneous sub-groups of exported goods. We employ a dynamic heterogeneous panel estimator, known in the literature as panel autoregressive distributed lag (panel ARDL) model, which uses an "error correction" approach to identify the short-

and long-run responses of export revenues to changes in relative prices and other macro fundamentals (equation 1):

$$\Delta y_{i,t} = \beta_0(y_{t-1} - \Phi'x_{i,t}) + \sum_{j=1}^p \beta_j \Delta y_{i,t-j} + \sum_{k=0}^q \gamma'_k \Delta x_{i,t-k} + \sum_{s=0}^3 \eta'_s z_{t-s} + \varepsilon_{i,t} \quad (1)$$

where y denotes exports revenues (at constant prices), x refers to a matrix of macroeconomic variables, and $z_{t-s} = (\overline{\Delta y}, \overline{\Delta x})$. The subscripts i and t refer to, respectively, the cross-section (firms and sectors) and time series (months and quarters) indicators, while the upper bar denotes the average of a random variable. Unlike standard panel data estimators (e.g. fixed and random effects), which assume uniformly fixed coefficients in the cross-section dimension, the panel-ARDL model allows coefficients to differ across the cross-section. In the present study, we compute the coefficients for 3 sub-groups of exported goods, constructed using 2-digit sectors in the UN Comtrade database.³ The dynamic heterogeneous panel estimators are based on seminal work of Pesaran and Smith (1995), Pesaran and Shin (1998), and Pesaran, Shin, and Smith (1999). Recent theoretical advances include Pesaran (2006) and Chudik, Mohaddes, Pesaran and Raissi (2013).

10. In the second part of our analysis, we try to quantify the impact of structural rigidities on export performance at the firm level. We use fixed effects panel data regression of firms' export revenues (at constant prices) on macro variables, controlling for time, firm, and sector-specific characteristics.⁴ To capture the impact of structural constraints on firms' export performance, we interact relative prices (REER) with structural indicators, as summarized in equation 2:

$$y_{i,j,t} = \beta_0 + \sum_{k=1}^I \gamma_k Firm_k + \sum_{s=1}^T \eta_s Time_s + \lambda ED_{j,t} \quad (2)$$

$$+ \beta_1 HI_{j,t} + \beta_2 PD_{i,t} + \beta_3 EG_{j,t} + \beta_4 LC_{j,t} + \delta_1 REER_t * HI_{j,t} + \delta_2 REER_t * PD_{i,t}$$

$$+ \delta_3 REER_t * EG_{j,t} + \delta_4 REER_t * LC_{j,t} + \varepsilon_{i,j,t}$$

where y denotes exports revenues (at constant prices); ED stands for sectoral external demand growth (i.e. annual growth of trading partners' imports of South Africa's exports); HI represents the Herfindhal index, while PD indicates the degree of product diversification—both try to capture product market rigidities; EG stands for electricity gaps; and LC is a proxy for labor market rigidities. The subscripts i, j , and t refer to, respectively, firms, sectors, and time periods. For EG and LC, we use the indicators described above. This panel data regression framework is useful to test whether the interaction terms can offset (or possibly amplify) the impact of relative prices on firms' export performance.

³ To be concrete, it first implements an ARDL regression for each time series in the dependent variable. Then by computing the mean of the group estimates, it generates the long run effect for the panel.

⁴ Due to the non-continuity of firms' exports activity throughout the sample period, the panel ARDL model could not be used in this part of the study.

11. Empirical Results

12. The dynamic heterogeneous panel data regression estimates suggest that manufacturing exports are more responsive to relative prices (REER) than commodity-intensive exports. Table 3 summarizes the main results, which indicate that a one-percent depreciation of the REER could boost export revenues by a little over 2 percentage points in the case of manufacturing exporters, while not having a statistically significant impact on commodity exporters. The impact of REER movement is relatively minor on mining. Even though mining companies are global price takers (foreign-currency denominated), it is expected that the rand depreciation should increase their profitability as some of the costs are local. However, the difficulty in increasing mining output to benefit opportunistically from the depreciation due to several reasons (technologically, ease of hiring labor etc.) may be a reason for the result.⁵ External demand is statistically significant for both sectors, with a higher impact on the performance of companies belonging to the mining sector. This finding is particularly important for South Africa given the increasing share of commodities in its total goods exports in the post-global financial crisis years.

Table 3. Long-Run Impact of Relative Prices on Export Performance, by Sector

		(1)	(2)	(3)
Variables	Expected sign	All Sectors	Mining	Manufacturing
REER	-	-2.40**	-0.88	-2.26***
External Demand	+	0.12	1.13***	0.85**
No. of Obs.		3,306	152	380
Method		CS-ARDL	CS-ARDL	CS-ARDL

Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

13. Firm level estimates suggest that sectors with higher electricity intensity, greater labor rigidity, and higher concentration have benefitted less from the depreciation. Table 4 contrasts the results of a “baseline” regression with an “augmented” regression that contains interaction terms involving the product of relative prices (REER) and the proxies for structural rigidities. All interactive terms are statistically significant and have the expected sign. Firms in the electricity intensive sectors have seen lower exports growth as lack of power has prevented firms to expand exports. Similarly, firms in sectors with greater labor market rigidities have worse export performance. After controlling for global demand conditions, the results partially explain why the mining sector, a sector which is relatively more energy intensive and had long production disruptions due to strikes, has performed

⁵ For a recent study on the external rebalancing of commodity exporters in the post-crisis period, see Perrelli (2014).

sub-optimally. The econometric findings also suggest that exports from sectors with high concentration have been less responsive to the depreciation, as low competition has resulted in a high cost structure, eroding competitiveness of those sectors. Our results also suggest that firms which are more diversified, i.e. that export in a greater number of sectors, have benefitted more from the depreciation. The interplay of these structural constraints varies across sectors, potentially magnifying (or offsetting) the impact of individual constraints.

Table 4. Impact of Structural Rigidities Export Performance, by Firm

Export Revenues	Expected Sign	(1)	(2)
		Baseline	Augmented
External Demand	+	0.02***	0.02***
Herfindahl Index	-	-9.77*	-9.03*
Diversification	+	14.56***	14.59***
Electricity Gap	-	-0.26	-0.43
Labor Condition	-	-1.66	-1.94
REER*Herfindahl Index	+		0.48*
REER*Diversification	-		-0.25***
REER*Electricity Gap	+		0.24**
REER*Labor Condition	+		0.22***
Observations		1,726,688	1,726,688
Time Frequency		quarterly	quarterly
Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1			

14. Policies to promote SMEs, in addition to creating jobs and exploiting SSA growth, could help increase the responsiveness of the economy to the currency depreciation. Our analysis also suggests that manufacturing exports are more responsive to rand depreciation, and SMEs are primarily exporting manufacturing products to SSAs. Therefore a larger SME sector could increase the flexibility of the economy and enhance external adjustment.

15. To enrich the analysis, there are several possible extensions. As highlighted in Edwards and Schoer (2002), and Edwards and Golub (2004), the performance of export firms depend on factors beyond the REER, such as unit labor costs (ULCs). The exercise could be repeated using sector-specific ULC-based REER, data permitting. The impact of the level of sector-specific REER on exports performance could be an area of further investigation. In addition, not only the magnitude of the REER changes, but also the impact of its persistence and its volatility on exports performance could be explored.

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A DISCUSSION OF FISCAL CONSOLIDATION OPTIONS IN SOUTH AFRICA¹

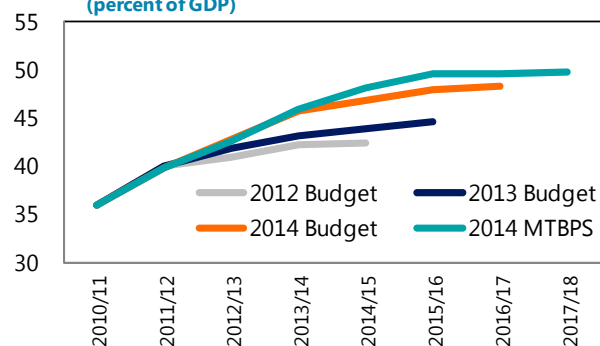
The government's 2014 Medium-term Budget Policy Statement (MTBPS) has put fiscal consolidation and the sustainability of public finances at the center of the government's fiscal strategy. This paper reviews lessons from other countries' consolidation efforts, discusses possible consolidation options, and attempts to assess their macroeconomic impact. Its main findings are: (i) South Africa's consolidation is likely to require both revenue and expenditure measures; (ii) relative to international comparators consumption taxes appear low and the wage bill high; (iii) given high inequality, compensating the most vulnerable for the impact of the consolidation is desirable and seems feasible. Finally, although fiscal consolidation will inevitably entail short-run economic costs, enhancing the credibility of the consolidation, monetary accommodation, improving spending effectiveness, and structural reforms could ease the impact of the adjustment on growth and employment.

A. Context

1. Over the past years, the government has adhered to stringent spending limits, but the deficit has remained persistently elevated as low growth has thwarted the authorities' consolidation plans.

The 2012 Budget introduced nominal ceilings for non-interest expenditure which have become a key element of the authorities' fiscal framework. Taking into account persistently weak growth, the 2014 Budget lowered the 3-year average real non-interest spending growth to 1.8 percent per year from 2.3 in the 2013 Budget. Since their introduction, expenditure outcomes have been at or below the ceilings. However, as growth continued to disappoint, the spending limits have not been sufficient to stabilize debt, which has increased substantially.

Spending limits have been insufficient to stabilize debt
(percent of GDP)



Source: South African National Treasury

2. The 2014 MTBPS announced policy measures to lower the fiscal deficit and stabilize government debt.

As stated in the 2014 Budget, fiscal policy in South Africa is guided by the principles of countercyclicality, debt sustainability, and intergenerational fairness. After years of countercyclical policies, the 2014 MTBPS announced that "debt levels have approached the limits of sustainability" and that "fiscal consolidation can no longer be postponed". To reduce the deficit,

¹ Prepared by Magnus Saxegaard and Jose Torres.

stabilize debt, and maintain investor confidence the 2014 MTBPS lowered expenditure ceilings by a cumulative 0.6 percent of GDP over the next two years, while protecting core social services and announcing efforts to increasing spending efficiency. Policy and administrative reforms yielding approximately 0.6 percent of GDP in additional revenue over the next two years are to be announced in the 2015 Budget.

B. What Does International Experience with Past Consolidations Tell Us?

3. Some lessons from past fiscal consolidations in other countries could be relevant for South Africa. After the global financial crisis many countries embarked on periods of fiscal consolidations, which revamped interest in factors that made past adjustments more effective, durable, and “growth friendly”. Although the literature continues to expand, some tentative conclusions can already be drawn:

- Large consolidations require both revenue and expenditure measures (IMF 2010a, 2014a). Relying on just revenue or expenditure measures might not only be unfeasible, but could create excessive distortions in the economy. For example, excessive spending cuts might have serious implications for the provision of public services. Similarly, further increasing taxes that are already high could disrupt incentives to work or invest.
- Across-the-board spending cuts should be avoided as they are inefficient and disproportionately affect the most vulnerable (IMF 2014a). Reductions in wasteful government spending should be prioritized, while decreasing well-targeted social transfers, public investment, or effective social expenditures would entail considerable short-run and long-run economic and social costs.
- To be sustainable, the consolidation needs to be perceived as fair, which requires that all parties are seen as contributing to the objective (Woo et. al. 2013).
- What matters is the overall impact of fiscal policy not the progressivity of each instrument; a regressive tax may be an effective way to finance progressive spending (IMF 2011, Goñi et. al. 2011). When poverty and inequality are important considerations, measures to compensate the most affected could be considered as part of the package.
- Strengthening of the primary balance, rather than higher growth, is typically the main factor behind large consolidations (IMF 2010b). Moreover, ambitious fiscal plans tend to be more successful than modest ones. On average about $\frac{3}{4}$ of the planned consolidation is achieved, as revenues typically underperform as a result of a lower-than-envisaged pickup in growth or because plans relying only on improvements in revenue administration or tax compliance, rather than on well-specified measures to broaden the tax base or raise effective rates, fall short of expectations (Mauro et. al. 2013, Abbas et. al. 2013a).
- Large fiscal consolidations are feasible, but typically stabilize debt at an average of 15 percent of GDP above its initial level. Bigger adjustments were achieved in countries where the initial fiscal balance was worse and where the consolidation efforts were sustained for a longer period. In

addition, there is some evidence that higher growth, as well as easy monetary and credit conditions, is associated with larger consolidations (Escolano et. al. 2014).

- Both expenditure- and revenue-based fiscal adjustments can be designed to mitigate the adverse effects on inequality. While the appropriate pace of fiscal adjustment depends on the state of the economy, the state of public finances, and the extent of market pressures, the progressivity of the consolidation depends on the specific measures adopted. Governments can protect efficient redistributive spending during fiscal adjustments and improve targeting to minimize the effects of the fiscal adjustment on inequality (IMF 2014c).

4. The many factors affecting the economic impact of consolidations complicate an assessment of the underlying fiscal multipliers. A substantial amount of work has been devoted to quantify the impact of different fiscal policy instruments on growth, employment, and inequality (Blanchard and Leigh 2013, IMF 2010c, Woo et. al. 2013, Acosta-Ormanchea et. al. 2012, Ball et. al. 2013, IMF 2014b), but a consensus is yet to emerge. It is not clear whether revenue or expenditure measures have larger fiscal multipliers. To further complicate things, the results vary depending on the state of the economy (expansionary fiscal policy is more effective during recessions), the time frame of the analysis (policies with limited short-run costs could have substantial long-run effects), the space for monetary policy easing (fiscal expansions are more effective at the zero lower bound for nominal interest rates), the exchange rate regime, the size of the economy, and the degree of openness (fiscal multipliers are smaller in small open economies with flexible exchange rates). In addition, there is an important tradeoff between economic efficiency and welfare and inequality. For example, cutting social transfers could have substantial welfare consequences in the short run while having only limited short-run effects on growth, but could induce higher growth and welfare in the long run.

5. Other aspects of the optimal design of a fiscal consolidation package remain unresolved.

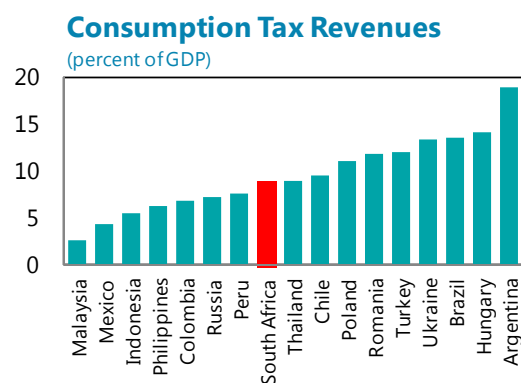
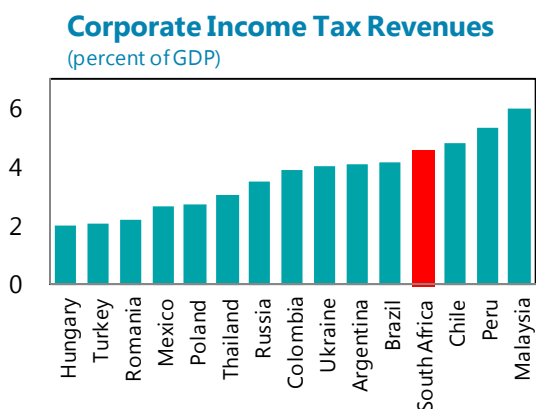
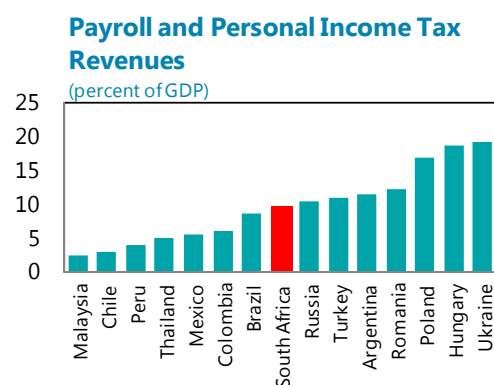
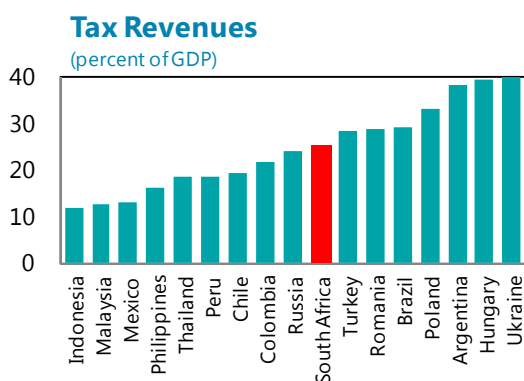
- **Gradual versus up-front consolidations.** A front-loaded consolidation can lead to a greater short-run output loss than a gradual effort does, even though it can also reduce the overall magnitude of the adjustment (Abbas et. al. 2013b). However, to be effective a gradual consolidation needs to be credible, and when the fiscal burden is already high and debt sustainability is questioned, the adjustment may need to be more aggressive.
- **Durability of revenue- or expenditure-based consolidations.** It is usually argued that spending-based consolidations tend to be the most durable as they reflect a stronger commitment from the authorities (Gupta et. al. 2005 and Kumar et. al. 2007). However, from a practical perspective, if revenues are increased by broadening the tax base, limiting exemptions, or raising rates, this would also have permanent implications for the fiscal balance.

6. South Africa has undertaken successful fiscal consolidations in the past. In 1993, the fiscal deficit was 8.8 percent of GDP. By 2006, it had become a budget surplus of 0.9 percent of GDP. The adjustment was mainly achieved by additional revenues from consumption and income taxes,

buoyed by higher growth, favorable terms of trade, and a reduction in interest rates. The external and domestic environment is currently more challenging, but the authorities' past performance underscores their commitment to pursue sustainable policies to achieve their goals.

C. An International Comparison of Revenue and Expenditure Levels

7. Tax revenues in South Africa have increased, but a cross-country analysis suggests consumption taxes remain low relative to peers. The increase in South Africa's aggregate tax collection since the end of apartheid in 1994 is testament to the revenue raising efforts of the South African Revenue Service (SARS). Tax revenues are now close to the median among peer EMs. Income taxes paid by individuals (including payroll taxes) are close to the average. On the other hand, revenues from corporate taxes are 0.9 percentage points of GDP higher than the average, whereas those from consumption taxes are 0.9 percentage points below.



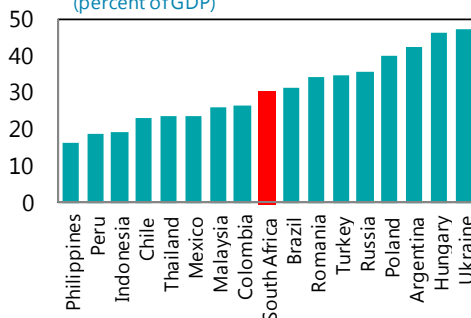
Sources: IMF's WEO and IMF's Article IV consultation reports
Note: The peer group of countries is subject to data availability

8. A comparison of government expenditure suggests South Africa's public sector wage bill is high relative to peers. South Africa's primary expenditure as a share of GDP is close to the middle of the distribution of peer EM countries. However, the aggregate number masks the fact that the wage bill is among the highest among peers, about 3.5 percentage points of GDP above average. Spending on transfers and subsidies in South Africa is low compared to other countries. This reflects partly the fact that South Africa does not have wasteful subsidies, which are a big

problem in some other countries, but also a young population which limits expenditure on old-age benefits. Unsurprisingly given considerable social challenges, spending on social protection is elevated compared to other countries. Spending on goods and services is at the average of the distribution, whereas public investment is somewhat below the median.

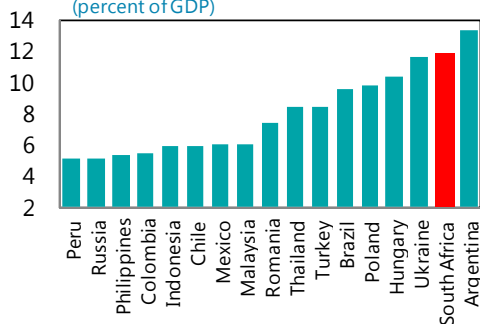
Primary Expenditures

(percent of GDP)



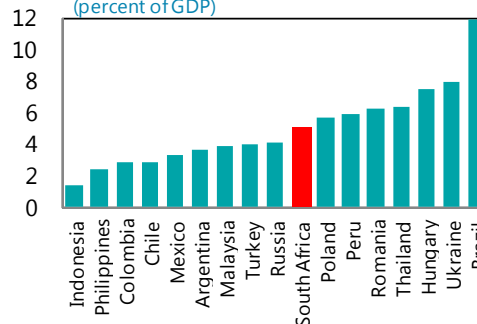
Wage Bill

(percent of GDP)



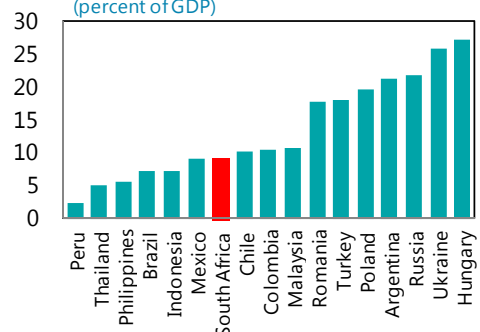
Goods & Services

(percent of GDP)



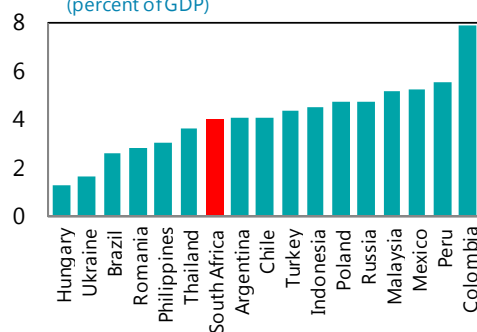
Transfers & Subsidies

(percent of GDP)



Public Investment

(percent of GDP)



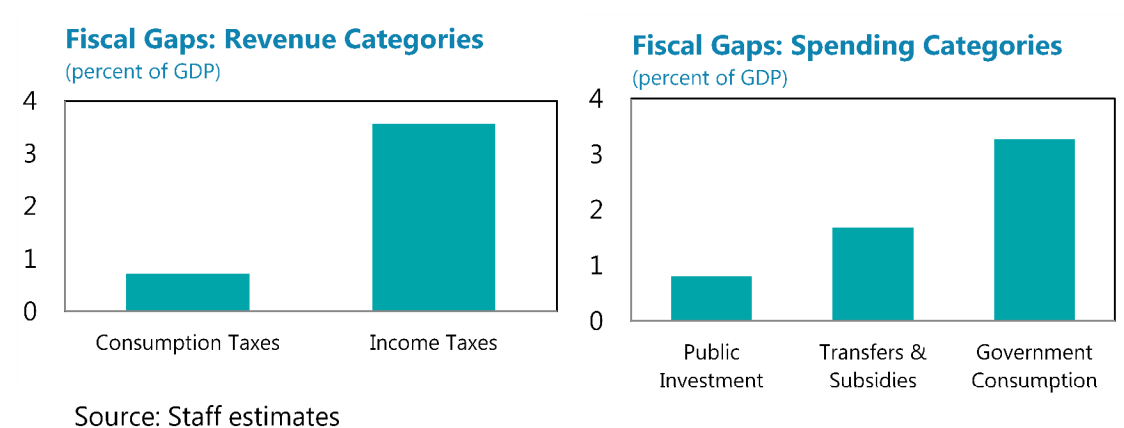
Sources: IMF's WEO and IMF's Article IV consultation reports
 Note: The peer group of countries is subject to data availability

9. Controlling for country-specific characteristics confirms that consumption taxes are relatively low and the public wage bill relatively high.

- A simple benchmarking exercise might be misleading as it ignores country-specific characteristics. To overcome this limitation, fiscal gaps for South Africa are computed as the

difference between observed and expected revenue and expenditure categories (as a share of GDP), taking into account specific economic and demographic characteristics (see Table 1 and the Appendix for further details).²

- The results for the revenue side suggest that after taking into account South Africa's level of development and relatively young population (plus other controls), its revenues from income taxes and consumption taxes are about 3.5 and 0.5 percentage points of GDP higher than would be expected. On the expenditure side, government consumption (including wages and purchases of goods and services), transfers and subsidies, and public investment are above the expected value by about 3, 1.7, and 0.8 percentage points of GDP, respectively. This cross-country analysis suggests therefore that consumption tax revenues are relatively low compared to income taxes (although the proceeds from both taxes are higher than predicted, the revenues from consumption taxes are only marginally above the expected level). Similarly, government consumption is relatively high compared to public investment (which is only slightly higher than predicted).



D. Simulating the Impact of Fiscal Consolidation

10. Simulating the impact of the fiscal consolidation requires making assumptions about the objectives, speed, and composition of the adjustment.

- This section simulates the impact of a fiscal consolidation package sufficient to reduce debt to the 2014 MTBPS projection of 50 percent of GDP by 2020. Staff estimates suggest this would require around 1½ percentage points of GDP in measures in addition to those announced in the 2014 MTBPS. The resulting impact on growth would depend on the degree of frontloading, credibility, and monetary accommodation.

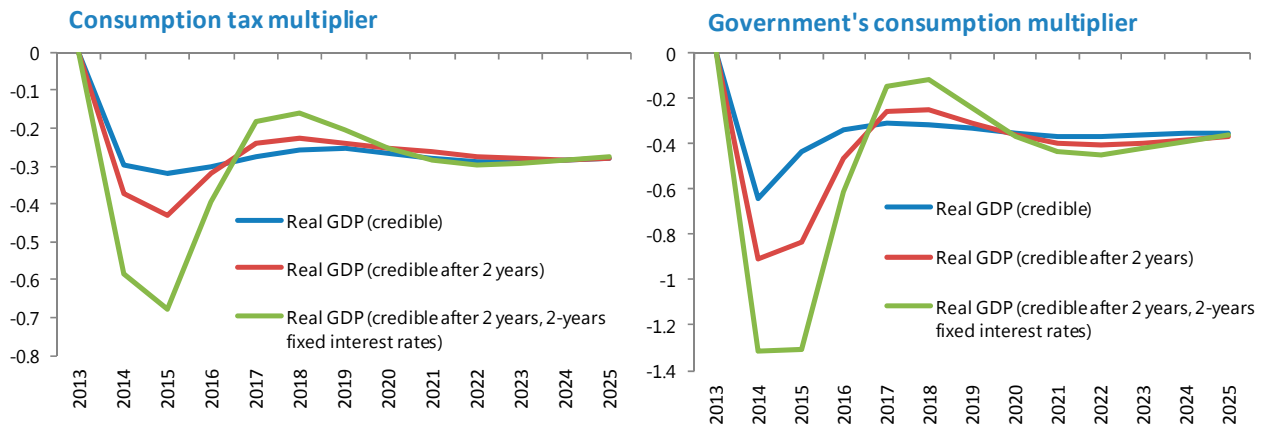
² The IMF's 2013 Fiscal Monitor presented the estimation of revenue gaps with a similar dataset and strategy.

- We utilize the IMF's Global Integrated Monetary and Fiscal Model (GIMF; for further details see Anderson et. al. 2013) to simulate the impact of this consolidation package on the South African economy. The simulations are done using a three-country version of the model (South Africa, China, and the rest of world). The model is calibrated using data on national accounts, labor shares in the non-tradable and tradable sectors, the external position, the trade structure, the fiscal position, and the inflation target. The main behavioral parameters for which there is limited data are kept constant across countries and calibrated in accordance with the existing literature. GIMF is particularly useful for the purpose of this analysis because it takes into account the endogenous response of debt to the short-run costs of fiscal tightening. Moreover, as it incorporates cash constrained consumers and different frictions it allows for meaningful short- and long-run dynamics.
- In addition to the measures already announced in the 2014 MTBPS, we assume an increase in consumption taxes equivalent to $\frac{1}{2}$ percent of GDP (resulting in a level of consumption taxes closer to the average among peer EMs) early in the consolidation to bolster investor confidence. We also assume a gradual reduction in the wage bill as a share of GDP by about 0.2 percentage points of GDP per year depending on the assumptions regarding the credibility of the adjustment and the responsiveness of monetary policy.

11. The economic impact of fiscal consolidation depends on a number of factors including the credibility of the adjustment and the degree of monetary accommodation.

- Figure 1 presents the fiscal multipliers for consumption taxes and government consumption implied by the model, under different assumptions about the responsiveness of monetary policy and the credibility of the consolidation. The results suggest that the short-run impact on growth depends critically on the credibility of the fiscal program and the degree of monetary easing that is available. For example, raising revenues from consumption taxes by one percent of GDP would reduce real GDP by 0.3 percent after two years. However, if the consolidation is not credible and no monetary policy easing is available during the first two years of the adjustment, the fall in GDP would be twice as large.

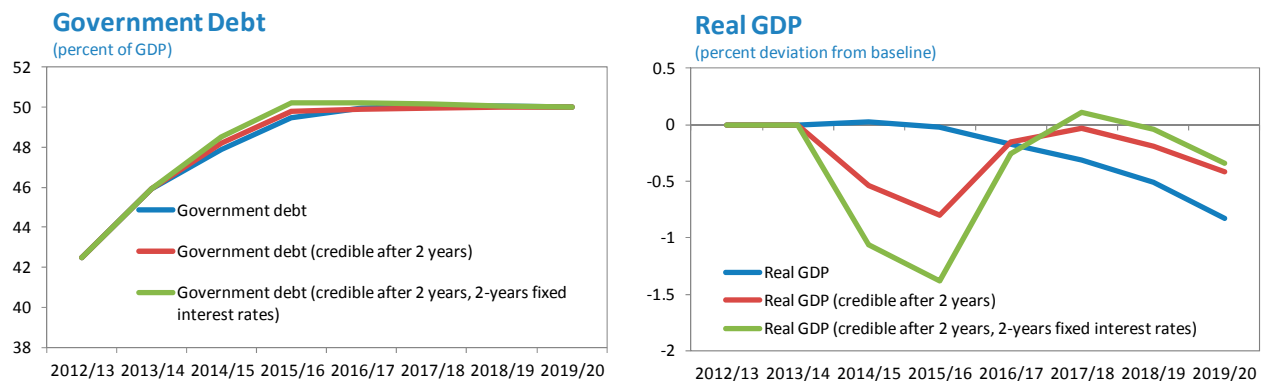
Figure 1. Real GDP Response to a one Percentage Point Consolidation



Sources: IMF staff's simulations.

- Figure 2 simulates the economic impact of the proposed consolidation package (which raises the revenues from consumption taxes permanently by ½ percentage point of GDP in the first year and reduces the wage bill by about 0.2 percentage points per year for six years). Under the baseline, which assumes the consolidation is fully credible and monetary policy accommodation is provided, debt would peak by 2018/19 and would be on a declining trend and below 50 percent of GDP by 2019/20. The short-run economic costs are relatively modest in the baseline, but significantly larger if the consolidation is not credible or if monetary accommodation is not forthcoming. The costs of the adjustment could further be reduced if the country implements structural reforms to invigorate growth, or increases its revenue and expenditure efficiency (which would allow it to increase its revenues without raising rates or broadening the base, and to reduce its spending without compromising service delivery).

Figure 2. Impact of a Consolidation Package that Raises Consumption Taxes and Lowers the Wage Bill

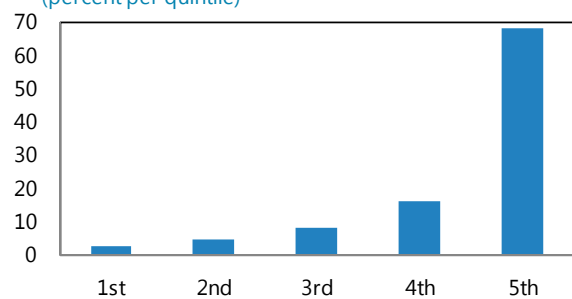


Sources: IMF staff's simulations.

12. The fiscal consolidation would affect growth in the short run, but the cost of protecting the most vulnerable from the adjustment seems manageable. Given high inequality, the lowest quintiles of the population consume a small share of aggregate consumption. This suggests that compensating the most vulnerable for the impact of the consolidation would only require a small increase in expenditure and could be done within existing transfer programs, which according to the World Bank (2014) are well-targeted and effective in reducing poverty and inequality.

Share of Aggregate Household Expenditures

(percent per quintile)



Source: 2011 Income and Expenditure Survey

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Appendix

The dataset contains a full decomposition of public revenues and expenditures (as a share of GDP) from 2007 to 2013 for 94 countries. Whenever possible, the information corresponds to the general government. The main source of information is the submission by country desks to the WEO in October 2013. The information was then corrected and completed with IMF country reports (Article IV and program reviews). When information was still missing, it was completed with revenue statistics from the OECD. Whenever possible, tax revenues directly related to natural resources (e.g. oil, gas, minerals) are included as non-tax revenue to make tax revenue comparable among countries.

Government revenue is broken down into seven categories:

- 1) *taxes on income, profits, and capital gains* (excluding taxes from oil and gas companies);
- 2) *other taxes* (mainly property taxes);
- 3) *payroll taxes* (all social security contributions for pensions, health, and unemployment insurance);
- 4) consumption taxes;
- 5) *taxes on international trade and transactions* (tariffs and duties);
- 6) *grants*; and
- 7) *non-tax revenues* (royalties, capital income, and commodity-related income).

Government's expenditure is broken down into four categories:

- 1) *government consumption* (wages, and purchase of goods and services);
- 2) *interest payments*;
- 3) *social benefits* (social security benefits, grants and subsidies, and other expenses); and
- 4) *net acquisition of nonfinancial assets* (public investment net of depreciation).

The explanatory variables used are:

- 1) Gross National Income per capita in nominal USD, as reported by the World Bank.
- 2) Expected years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrollment rates persist throughout the child's life, as reported by UNESCO.
- 3) The growth gap estimated as the difference between observed GDP growth and its projection for 2018 as reported in the IMF's WEO (used as a proxy for potential growth).
- 4) Old-age dependency ratio, the ratio of population older than 65 to the population aged 15-64, as reported by the United Nations Population Division.
- 5) Net oil and gas exports (as a percentage of GDP), as reported in the IMF's WEO.
- 6) Imports (as a percentage of GDP), as reported in the IMF's WEO.
- 7) Political participation index, as reported in the Democracy Index of the Economist Intelligence Unit.
- 8) Gross public debt (as a percentage of GDP), as reported in the IMF's WEO.
- 9) Gross minimum annual wage (nominal USD), as reported in the World Bank's Doing Business Surveys.

The countries in the dummy variable *Caribbean* are: Antigua and Barbuda, The Bahamas, Barbados, Dominica, Dominican Republic, Grenada, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. The dummy variables *EUR*, *AFR*, *APD*, *WHD* and *AFR* correspond to IMF area departments.

Table 1: Determinants of Revenue and Expenditure Categories

	Domestic Tax Revs.	Income Taxes	Payroll Taxes	Taxes Goods & Services	Primary Expenditures	Government Consumption	Transfers and Subsidies	Public Investment
GNI per capita (thousands of usd)	0.00001*** (0.00)	0.00001*** (0.00)	0.00001*** (0.00)	-0.001*** (0.00)	0.00001*** (0.00)	-0.00002 (0.00)	0.0002*** (0.00)	-0.00005*** (0.00)
Old-age dependency ratio (+65/15-64)	0.4*** (0.04)	0.040 (0.03)	0.3*** (0.03)	0.1*** (0.02)	0.3*** (0.07)	-0.3*** (0.06)	0.6*** (0.05)	-0.1*** (0.02)
Political particip. (Democracy index)	0.8*** (0.15)	0.6*** (0.10)	-0.01 (0.09)	0.2*** (0.09)	0.1 (0.25)	0.2 (0.20)	0.2 (0.18)	-0.3*** (0.07)
Net oil and gas exports (% of GDP)	-0.1*** (0.01)	-0.05*** (0.01)	0.0005 (0.01)	-0.08*** (0.01)	0.2*** (0.02)	0.06*** (0.02)	-0.01 (0.01)	0.08*** (0.01)
Imports (% of GDP)	-0.03*** (0.01)	-0.02*** (0.01)	0.002*** (0.00)	0.001 (0.00)				
Growth gap	0.1** (0.03)	0.02 (0.02)	0.003 (0.02)	0.02 (0.02)	-0.1* (0.04)	-0.1*** (0.03)	-0.04 (0.03)	0.02** (0.01)
Gross debt (% of GDP)					0.02** (0.01)	0.02*** (0.01)	-0.01 (0.01)	-0.005** (0.00)
Gross min. annual wage (thousand usd)					-0.2*** (0.06)	0.1** (0.04)	-0.4*** (0.04)	0.05*** (0.02)
Expected years of schooling					0.7*** (0.22)	1.5*** (0.16)	-0.3* (0.15)	-0.2*** (0.06)
Constant	6.5*** (1.46)	2.3** (0.91)	-1.9*** (0.83)	4.2*** (0.85)	9.9*** (3.01)	-7.7*** (2.31)	3.1 (2.08)	10.5*** (0.86)
Grants (% of GDP)					0.200 (0.26)	0.8*** (0.21)	-1.3*** (0.19)	0.2*** (0.07)
Dummy for IMF Program	-0.6 (0.66)	-0.3 (0.41)	-0.2 (0.37)	0.7* (0.38)				
Dummy for EUR	11.5*** (0.74)	0.5 (0.50)	7.1*** (0.55)	5.6*** (0.42)	11.6*** (1.11)	4.4*** (0.88)	7.4*** (0.79)	0.3 (0.31)
Dummy for AFR	3.8*** (1.05)	1.7** (0.71)	0.6 (0.62)	2.1*** (0.60)	2.6* (1.57)	1.0 (1.24)	1.9* (1.12)	-1.1** (0.44)
Dummy for MCD	-1.3 (1.00)	-1.2* (0.64)	1.1 (0.59)	0.8 (0.58)	2.5* (1.52)	-2.3* (1.20)	6.3*** (1.08)	-1.3** (0.43)
Dummy for WHD	3.8*** (0.90)	-0.2 (0.60)	3.0*** (0.059)	1.5*** (0.53)	0.800 (1.15)	0.300 (0.91)	1.000 (0.82)	-0.3 (0.32)
Dummy for Caribbean	-3.8*** (0.97)	0.9 (0.60)	-3.5*** (0.59)	-0.7 (0.57)				
Number of Observations	560	560	560	560	525	525	525	525
Rw-squared	0.92	0.72	0.86	0.77	0.72	0.46	0.82	0.74

***, **, *: statistically significant at 1, 5, or 10 percent.

Sources: IMF's WEO, IMF's Article IV consultation reports and IMF staff's estimates.