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# SARB Occasional Bulletin of Economic Notes

## August 2019

### Contents

1. Capital flow reversal and impacts through the financial sector  
*Konstantin Makrelov*
2. A novel supply-side approach to estimating the impact of load shedding on GDP growth in South Africa  
*Kgotso Morema, Jeffrey Rakgalakane, Theresa Alton and Pamela Mjandana*
3. *Assessing the accuracy of the SARB's growth forecasts*  
Riaan Ehlers, David Fowkes, Nkhetheni Nesengani and Rowan Walter
4. South Africa's disinflation: A cyclical phenomenon  
*Thulisile Radebe*
5. The industrial policy debate: State of affairs  
*Witness Simbanegavi*
6. The effectiveness of the Employment Tax Incentive  
*Bojosi Morule and Konstantin Makrelov*

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## Capital flow reversal and impacts through the financial sector

*Konstantin Makrelov*

### Abstract

Capital flows are important source of savings in a savings-constrained economy such as South Africa's. Capital outflows can reduce liquidity and growth in asset prices, increase default probabilities and push lending spreads up (tighten financial conditions). The impacts from capital flow reversals, taking into account the transmission through the financial sector, is almost twice as large compared to previous studies. Expansionary fiscal policy crowds out and exacerbates the capital outflow impacts. Higher policy rates or improvements in fiscal metrics can be expansionary by reducing capital outflows and the domestic savings constraint.

### INTRODUCTION

Net capital flows into South Africa have slowed down significantly since 2015 in response to tightening financial conditions globally and deteriorating domestic economic situation.

This note estimates the effects of a capital reversal shock on the South African economy. Despite a low stock of short-term foreign currency denominated debt, the effects are significant.<sup>1</sup> A capital flow reversal tightens savings constraints and through its impact on the demand for assets and asset prices causes a deterioration in the balance sheets of South African institutions, particularly banks. This, in turn, generates higher lending spreads, leading to further declines in asset prices and balances sheets, creating a feedback loop between the real economy and the financial sector. When fiscal policy remains expansionary and government debt issuance increases, the effects are larger as private investment and consumptions are crowded out.

### CAPITAL FLOWS IN SOUTH AFRICA

Structurally low levels of domestic savings in South Africa have led to high reliance on foreign savings. This has increased South Africa's vulnerability to capital flows volatility, despite a relatively low level of foreign currency denominated debt (just over 20 per cent of GDP). Capital flows have strong impact on asset prices and borrowing costs and decisions to accumulate assets and liabilities by domestic institutions.

Net foreign saving inflows slowed significantly between 2008 and 2009 as the global financial crisis hit South Africa (Figure 1). As central banks in advanced economies embarked on unconventional monetary policy, net saving inflows accelerated. The inflows slowed down again over the period 2016 and 2018 as

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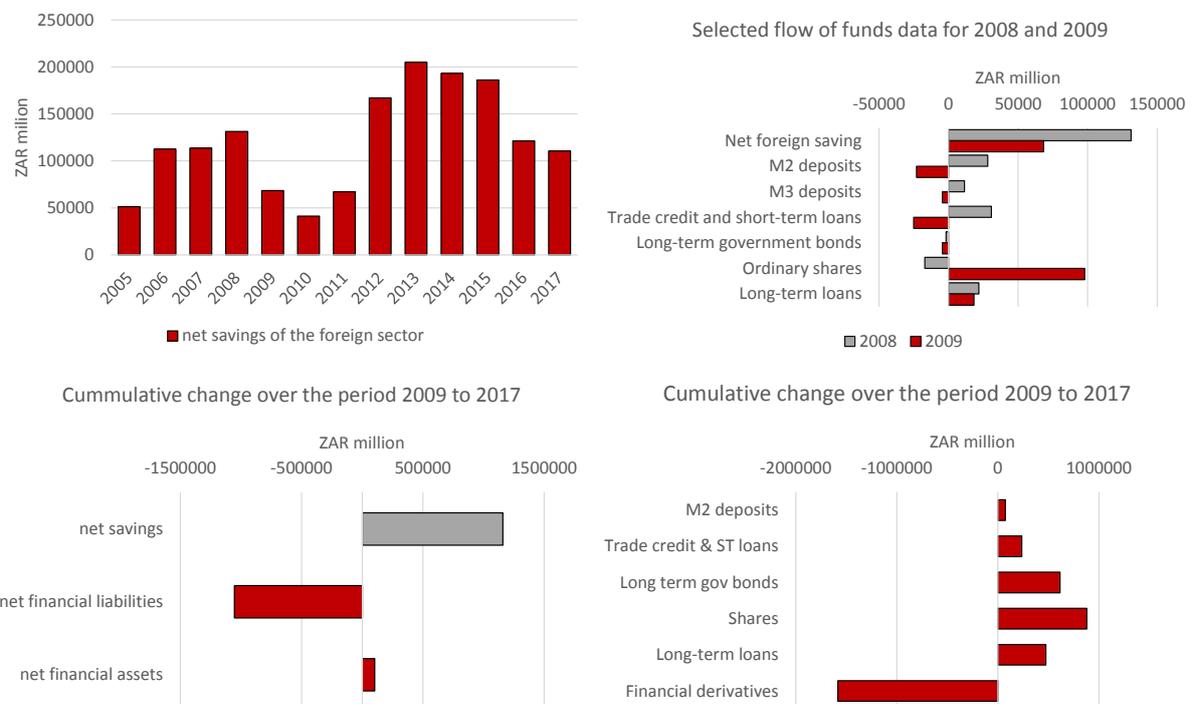
<sup>1</sup> See Frankel, Smit and Sturzenegger (2008) and Smit, Grobler and Nel (2014) for previous estimates.

policy uncertainty increased in South Africa and as monetary policy in some advanced economies started to normalise. The reduction in capital inflows in those periods is significant, constituting a capital flow reversal shock to the economy (see top-left panel of Figure 1).

The top-right panel of Figure 1, indicates that the adjustment in net foreign savings in 2009 took place mainly through deposits, short-term loans and shares.<sup>2</sup>

The bottom two panels of Figure 1 present the cumulative gross flows. The bottom left panel indicates that there has been a significant decline in the net financial liabilities of the foreign sector over the period. These are the foreign assets of South African residents. This is likely to reflect capital gain losses but also a return of South African assets as the currency depreciated. Foreign saving inflows increased over the period, resulting in a large compositional change in the foreign holdings of South African financial assets. The holding of long-term government bonds, shares, and long-term loans recorded a significant increase.<sup>3</sup> This indicates that understanding the economic impacts of capital flows, requires tracing the impacts through the financial sector.

**Figure 1: Adjustment to lower net foreign savings**



Source: South African Reserve Bank

<sup>2</sup> The increase in shares may reflect some correction after the low levels of inflows in 2008 and expectations of stronger returns as economic activity recovered.

<sup>3</sup> Financial derivatives include instruments such as options and swaps. The negative value reflects that at maturity, the value of the derivative instrument (calculated as the net value of all transactions) falls as the instrument is exercised.

## THE TRANSMISION MECHANISM

Capital flow reversals and sudden stops are caused by both domestic and global factors, with perceptions of risk being an increasingly important driver (Ahmed and Zlate 2014; Brafu-Insaidoo and Biekpe 2014; Forbes and Warnock 2012; Rey 2015; Rothenberg and Warnock 2011).<sup>4</sup> Recent research shows that the risk-taking channel of monetary policy, identified by Borio and Zhu (2012), is a major driver of capital flows. Bruno and Shin (2015) find that expansionary monetary policy in the US reduces risk premiums and borrowing costs for global banks, increasing funding for international subsidiaries and other regional banks as relative returns increase. The financial sector through its lending and pricing is key in transmitting capital flow reversal shocks and exacerbating their impact (Joyce and Nabar 2009; Mishkin 1998).

An increase in capital inflows reduces domestic credit constraints and increases lending. This increases asset prices and capital gains and improves the net worth of domestic institutions, encouraging further inflows. In a second-round effect, this translates into further improvements in net worth.

Movements in the currency can reinforce the standard financial accelerator mechanism. Higher capital inflows lead to an appreciation of the currency, which should eliminate the arbitrage opportunity and slow down the inflows. The appreciation, however, improves the balance sheets of those firms whose debt is denominated in foreign currency and, along with higher asset prices, encourages higher inflows (Brunnermeier et al. 2012). The reversal in capital flows starts a process which works the opposite way, with the depreciation in the currency and the fall in asset prices, leading to a deterioration in the credit worthiness of some firms and households. Borrowers become less likely to pay their loans and the performance of the banking sector deteriorates. Companies engage in distress sales driving down asset prices, encouraging further capital outflows and exchange rate depreciation and setting off a downward spiral in the case of severe reversal in capital flows (Joyce and Nabar 2009). In this case the depreciation of the currency, which is expected to stabilise the economy through its impact on competitiveness, increases the output losses through its impact on net worth (Blanchard et al. 2010).

## RESULTS

We model the response to a capital flow reversal shock. The transmission mechanism operates through the lending spread, asset prices, the balance sheets of all institutions and the feedback mechanisms between the real and financial sectors.<sup>5</sup>

We simulate a decline in net foreign savings by 2 per cent of GDP over four quarters and compare the results to a scenario where household expectations are more myopic (households are more uncertain about the future). This shows how household behaviour can amplify the impacts.

The decrease in foreign savings inflows reduces the purchases of South African financial assets, resulting in a fall in equity prices and a rise in yields.

Table 1 shows the changes to the asset holdings of the various institutions.

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<sup>4</sup> Sarno, Tsiakas and Ulloa (2016) find that global factors such as US interest rates and global risk aversion explain close to 80 per cent of the variation in global bond and equity flows.

<sup>5</sup> For detailed description of the model see Makrelov et al. (2018)

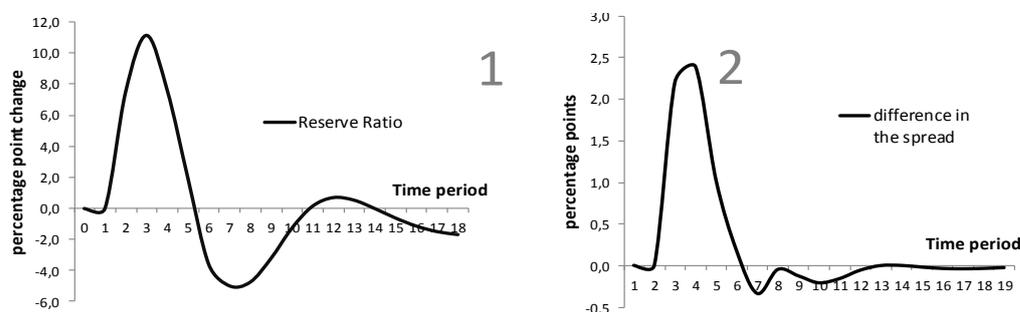
**Table 1: Changes to the holding of financial assets<sup>6</sup>**

deviation from baseline	Assets			
	Equities	Bonds	Cash and dep	Loans
t+3	simulation	simulation	simulation	simulation
Reserve Bank	-0.4	2.0	0.0	0.0
Financial sector	-0.7	5.4	-1.7	-2.9
Non-financial sector	-0.4	0.0	-1.6	-0.3
Households	-2.0	0.0	-2.2	0.0
Government	-0.4	0.0	-1.8	-0.1
ROW	-19.3	-12.6	-22.5	-14.6

Source: Model simulations

The fall in equity prices reduces the creditworthiness of firms and households. There is an increase in the probabilities of default and the perception of risk, and deterioration in valuations of financial and housing assets. Lending spreads in the economy increase.<sup>7</sup> The banks' cash reserve ratio in our model jumps, reducing the money multiplier and the supply of loans by the financial sector (panel 1 in Figure 2). The repo rate declines as the output effect dominates the price effect. The reduction in the supply of loans increases the spread over the repo rate and the loan rate rises.<sup>8</sup> This is depicted in panel 2 of Figure 2. Eventually, the reserve ratio decreases as the flow of foreign capital recovers.

**Figure 2: Interest rate spread and reserve ratio**



Source: Model simulations

<sup>6</sup> The underlying data indicates that the Reserve Bank has a small holding of equities. In the model, the quantity of shares held by the Reserve Bank is fixed but the price is allowed to vary. The decline in the equities value reflects the decline in the price.

<sup>7</sup> This follows the theoretical models of Woodford (2010) and Borio and Zhu (2012). In the model developed by Woodford (2010), the lending spread is a function of financial sector institutions' capital. Raising the level of capital is costly and leverage is limited by regulatory requirements. Shocks that impair the capital of the institution (bank, or, more generally, financial intermediary) or create capital ratio regulatory requirements translate into higher lending spreads and lower volumes of lending and economic activity. Borio and Zhu (2012) also link the capital of the financial sector to bank behaviour. Breaching the minimum capital threshold is costly for a bank. In the face of a possible breach, banks will take defensive action to avoid the high costs, which will impact the availability and pricing of funding extended to customers. The economic cycle changes the strength of this effect as probability of default, valuations, and the perception of risk change. In turn, this shifts the relative position of the banks' capital to the regulatory threshold and impacts bank behaviour. The accelerator effects in both models are driven by the relationship between capital and economic activity. Higher economic activity reduces the probability of default and the perception of risk, and improves valuations. This reduces lending spreads, which encourages further improvements in economic activity.

<sup>8</sup> This mechanism is also in line with the empirical findings in Rey (2015).

Table 2 shows the impact on investment in the first quarter (t+1) after the shock and ten quarters (t+10) after the shock. Investment by non-financial firms is initially 3.8 per cent lower, and it is 3.9 per cent lower in the outer quarters despite the recovery in the inflows of net foreign savings. This decline reflects the permanent decline in equity prices relative to the baseline. The fall in the equity price relative to the baseline reflects lower expectations of inflation initially, and lower growth in money supply, while the medium-term effect is driven by a permanently lower stock of capital and lower levels of capacity utilisation compared to the baseline.

The exchange rate depreciates and net exports increase, but in line with the South African experience the adjustments is mainly through a reduction in imports.

The reduction in foreign savings requires rebalancing with higher domestic savings and lower investment, leading to a slowdown in economic activity. The increase in domestic savings occurs by reducing dividend payments, which are close to 40 per cent lower compared to the baseline. This impacts negatively on all institutions, especially households.

Lower dividend income and higher interest expenditure reduce their ability to save and consume. Factor income also declines as capacity utilisation declines.

The immediate impact on household consumption is large and negative (Table 2). As foreign savings normalise, household consumption recovers, but remains below the baseline. Household behaviour is driven by desired levels of future wealth and consumption. Lower inflation mitigates somewhat this impact in the short run as the household is targeting real wealth.<sup>9</sup>

**Table 2: Impact on real expenditure**

per cent deviation from baseline	capital flow reversal	
	t+1	t+10
Household expenditure	-2,43	-0,67
Investment		
Non-financial firms	-3,81	-3,88
Other-institutions	-4,11	-4,14
Exports	0,25	-0,97
Imports	-4,74	-0,96
GDP	-0,48	-0,97

Source: Model simulations

With lower holdings of cash and deposits and preference for higher reserves, the financial sector reduces the extension of loans. The balance sheet of the financial sector is smaller relative to the baseline. All asset holdings for the sector, except bonds, decline (see Table 1).

The non-financial sector also reduces its holding of assets. While savings increase initially, the ability of the sector to fund its accumulation of financial wealth and investment through equity sales is lower relative to the baseline. Loans as a source of funding also decrease as lending rates are higher and income for the sector is lower.

<sup>9</sup> If monetary authorities are unable to anchor inflation, the household response in the framework will be to reduce consumption further, generating more negative economic impacts.

The government response to the shock is particularly important for our results. Government expenditure remains unchanged, but government income decreases. This leads to higher bond issuance. The capital outflows decrease the demand for bonds as financial conditions tighten. A significant increase in bond yields is required in order for the higher issuance to be absorbed by the domestic market. This crowds out investment and consumption.

Another channel exacerbating the initial crowding out is through the compositional changes in the balance sheet of the financial and foreign sectors. Funds are redirected from cash and deposits, supply of loans and equities to government bonds, which reduces the money multiplier in the framework.

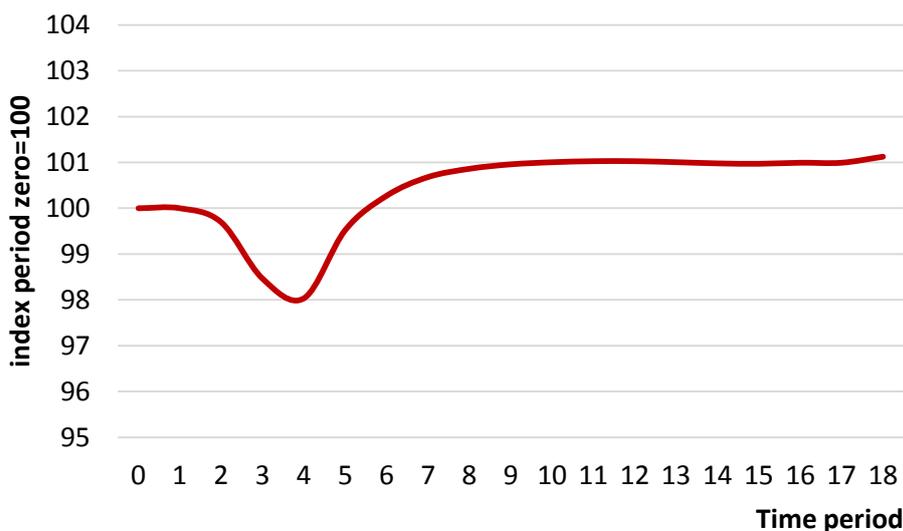
If households try to achieve their wealth targets quicker, over three rather than ten quarters (reflecting higher perceptions of uncertainty), consumption falls further and amplifies the negative effects associated with the capital flow reversal. This is shown in

As household savings increase, household consumption eventually recovers. In the outer years, household consumption in simulation two is slightly higher relative to simulation one. A higher stock of assets generates relatively higher interest and dividend income in the outer periods. While the higher levels of household savings generate short-term negative effects, the medium to long-run effects are higher stock of assets and more consumption.

Figure 3, which plots the ratio of consumption under simulation two to simulation one, indexed to 100 in the base year. The impact shows a larger decline in the household consumption over the period associated with the capital flow reversal. The level of consumption in the second simulation is 2 per cent lower than in the first simulation.

As household savings increase, household consumption eventually recovers. In the outer years, household consumption in simulation two is slightly higher relative to simulation one. A higher stock of assets generates relatively higher interest and dividend income in the outer periods. While the higher levels of household savings generate short-term negative effects, the medium to long-run effects are higher stock of assets and more consumption.

**Figure 3: Ratio of consumption under simulation two to simulation one**



Source: Model simulations

## CONCLUSION

Our main result is that even in the absence of a large stock of foreign-currency denominated debt, a reversal in capital flows can still generate a sizable impact through reducing the demand for South African assets and tightening financial conditions. Our results are larger than those generated by comparative studies for South Africa.

Our results have several implications:

- Lending spreads can fall when the real risk-adjusted interest rate differential increases. If the economy has foreign-currency denominated liabilities, depreciation will worsen the economic impact in the absence of a higher policy rate.
- When the economy is saving constrained, fiscal policy should reduce crowding out by decreasing spending and the issuance of government debt.
- Higher savings reduces reliance on foreign savings inflows and the economic volatility associated with the capital flow cycle, creating higher levels of wealth and consumption in the medium term.

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