

**The impact of volatile commodity prices, exchange rates and interest rates:
reflections of a former business economist.**

SARB Biennial Conference: October 2016

Gavin Keeton

Department of Economics and Economic History
Rhodes University

1. Introduction

In 1990, corporate South Africa was dominated by large, diversified groups. Interestingly, few of these are around today. The Top 20 companies on the JSE today either did not exist in 1990 or are unrecognisable from their previous structure and ownership.

In 1990 the largest groups typically embraced both mining and finance. They often also included considerable industrial holdings. The focus of this paper is on the importance of interest rates and exchange rates for the “mining finance houses”, and in particular Anglo American Corporation of South Africa (from 1999, Anglo American plc), for which I worked as an economist, and later Group Economist, from 1990-2008.

For those unfamiliar with South African corporate history a very brief historical background is necessary. Gold was discovered on the Witwatersrand in 1886. The size of the deposit was unprecedented. But the gold was very deep, of low grade and trapped in hard rock. It could profitably be extracted only on a large scale, which required large amounts of capital that only large companies could provide. Initially the mining companies were British, German and French. It was later discovered that the deposit also stretched east and west of Johannesburg, but at even greater depths. Anglo American was established in 1917 by Ernest Oppenheimer to exploit deposits east of Johannesburg. Despite its name, it was the first large South African mining company.

Mining companies can focus on a single commodity e.g. gold or coal. Growth must then come about by expanding existing operations or by opening new mines. Growing in a single commodity inevitable requires geographical expansion, as for most commodities individual countries have limited deposits.¹

Alternatively, mining companies can expand by increasing the range of commodities mined. This path was always Ernest Oppenheimer’s intention. Diamonds were his first love and he quite quickly used the growing financial strength of Anglo American to gain control of De Beers. Anglo also developed mines in the Zambian Copper Belt. The “game changer” for Anglo was its successful development of the Free State gold fields in the early 1950s. This propelled Anglo to the forefront of South African mining. Anglo also became a major player in coal mining – developing the ‘washing’ process that enabled the upgrade of South Africa’s low-grade coal deposits for export through Richards Bay.

From its early days Anglo also developed or acquired industrial interests. Initially these were related to mining, such as the explosives produced for the mines at AECI and the development of Highveld Steel and Vanadium. These industrial interest expanded to include Mondi (pulp and paper), sugar (Hulleths), Scaw Metals (steel) and a wide range of disparate products. Disinvestment by foreign companies

¹ There are exceptions to this claim. Platinum has been found only in South Africa and Zimbabwe. The size of copper deposits in Chile and iron ore in Brazil are so great that both countries developed large national single product champions (Codelco and Vale). But even Vale in recent years started to expand outside of iron ore and outside Brazil.

because of Apartheid enabled Anglo to buy cheaply the motor vehicle interests of Ford and control of the South African operations of Barclays Bank (which was renamed FNB).

Investors could buy shares directly in many of the individual assets controlled by the mining finance houses, sometimes they could buy various collections of the assets, or they could buy the complete basket². For example, an investor could buy shares directly in an Anglo gold mine such as Vaal Reefs, or they could buy the complete basket of Anglo's gold operations in Amgold (later AngloGold). They could buy shares in Highveld Steel, or in the complete basket of Anglo's industrial operation through the listed company Amic. This was not true of all operations. Mondi (pulp and paper) was not listed, but made up a substantial part of Anglo's industrial operations. In the early 2000s it was the largest contributor to Anglo's overall earnings.

At the centre, the mining finance houses provided large centres of technical expertise. Geologists, metallurgists and mining engineers would work across the group's holdings, transferring skills developed in, say, diamonds, to problems faced in copper. They also had high levels of financial skills at the centre. Corporate Finance at Anglo was effectively an in-house investment bank, with all the skills needed to value mergers and acquisitions and financing thereof.

The peculiar structure of these corporate holdings was partly the result of the nature of the operations. For example, a new gold mine takes years to construct and become operational. Few investors have pockets deep enough to fund this. But the mining finance houses would develop a new mine and, once it was profitable, list it, dilute their holding to say, 30%, and then use the funds raised to develop new mines.

The structure was also the consequence of South Africa's political status globally and the related imposition of foreign exchange controls on domestic companies. In a different world, the SA mining houses would unquestionably have focused much more on mining. They would have deployed funds and expertise to develop operations in, say, Australia and South America, rather than buying brewing or banking assets. But exchange controls prevented profits from being utilised abroad. SA companies could also not use their domestic balance sheets as security for overseas borrowings. The opprobrium of being a South African company also severely hampered attempts to operate outside South Africa.³ There were also only so many gold or diamond mines that one could own in South Africa. So political isolation encouraged initially diversifying mining assets and thereafter diversification into areas increasingly unrelated to mining.

Anglo, however, was able to develop some offshore mining interests. When the Zambian government nationalised its copper mines in 1969 Anglo was allowed by the SA Reserve Bank to keep the proceeds offshore in a Luxembourg-registered

² Except for Old Mutual and Sanlam which were mutual companies until their listings in 1999 and 1998 respectively.

³ There were obvious exceptions to this. Rembrandt was very successful in expanding globally as was Liberty International. But Pick n Pay's attempt to expand into Australia was thwarted largely because of anti-South African sentiment.

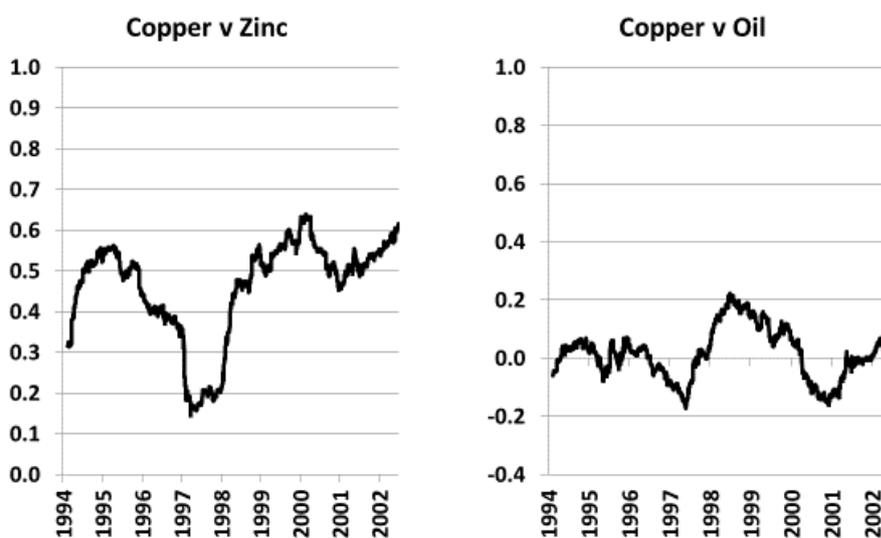
company, Minorco. This cash was used to develop mining assets in Brazil and Chile. Not only did Anglo have the cash outside of SA necessary to do this, its South African background was not a problem to South American governments who were generally shunned because of the perceived high political and economic risk of operating then in South America.

It is not the intention of this paper to discuss the problems associated with the resultant corporate structures that existed at the end of the Apartheid. That there were inefficiencies is clear from the rapid restructurings that occurred after 1994. Rather the paper will examine the consequences of asset and geographical diversification for the impact of monetary policy and exchange rates on their operations.

2. Corporate structure and commodity price volatility

Diversified mining companies such as Anglo (and non-SA diversified miners like BHP and Rio Tinto) argued that their model was superior to that of single-product companies like Alcan and Alcoa (both aluminium) or CVRD (now Vale – iron ore) because the prices of mining commodities were unsynchronised. This lack of synchronisation is illustrated in Figure 1, which shows the 12-month rolling correlation between daily changes in spot copper and zinc prices, and copper and oil prices from 1994 to 2002. The correlation between the prices of the 2 base metals is low, while there is almost no correlation at all between the prices of copper and oil. Changes in the prices of each commodity over the period were due to commodity-specific changes in demand and supply.

Figure 1: 12-month rolling correlations between changes in daily spot prices⁴



⁴ All data in this paper are from the SA Reserve Bank online statistical database or Thomson-Reuters Datastream

For diversified producers, this lack of price synchronisation helped smooth their earnings over the different product cycles. If one of their products, say, copper was doing badly, then usually another, say coal, might be doing well. Diversified producers might then be cash flush when, say, single-product copper producers were struggling, and this also provided opportunities for cheap acquisitions at the bottom of cycles. For Anglo's operations, a downturn in the rich industrial economies might cause a fall in diamond demand. Prices of commodities used in infrastructure investment would, however, be determined more by economic performance in developing economies. Moreover, the downturn in rich countries would probably be a time of strong gold prices, as nervous investors sought solace in the safe haven offered by gold.

A further consequence of non-synchronised commodity prices was that diversified producers were reluctant to hedge prices forward. They already had a natural hedge through their commodity diversification.

During the so-called "super-cycle" boom of commodity prices from 2003-2011 commodity prices became increasingly synchronised. The reasons for this are beyond the scope of this paper.⁵ However, the consequence was a strident call for diversified miners to reduce their diversification and to focus only on producing commodities with the greatest margins. Since prices fell in 2011, individual commodity prices have again become increasingly unsynchronised. Possibly diversification will become more fashionable again in the future.

2.2 Corporate structure and exchange rates

Geographic diversity provided a similar natural hedge with regard to exchange rate fluctuations. Trying to guess correctly the movements of individual exchange rates undermined part of the logic of operating simultaneously in different markets. Thus miners were reluctant to sell their dollar earnings forward.

This did not mean exchange rates were unimportant. Because mining costs are determined in the domestic currency where operations are located, but earnings are usually in US dollars, a weakening domestic exchange rate means operating costs fall in US dollars and so profit margins widen. Conversely a stronger exchange rate increases operating costs in dollars and reduces profits.

2.2.1 Diversity provides a "natural hedge"

Whether by design or accident, Anglo was also able to argue that the location of its operations predominantly in emerging markets gave it a further natural hedge

⁵ See Mann, L. & Keeton, G. (2013). The impact of financialization on commodity prices in the post-2003 commodity "super-cycle". Unpublished paper presented at the Economic Society of South Africa's Biennial Conference, Bloemfontein.

against exchange rate fluctuations. This is because the exchange rates of commodity-producing countries like SA, Brazil and Chile tend to fall when commodity prices are low and strengthen when commodity prices are high. This is because export earnings in these countries are impacted meaningfully by changes in commodity prices. In countries where commodities make up a small proportion of export earnings the same relationship does not exist.

This relationship is illustrated in Figures 2 and 3 which show historical changes in exchange rates and commodity prices in several commodity-dependent countries. The positive relationship between changes in the exchange rates of South Africa (Figure 2(a)), Chile (Figure 2(b)) and Australia (Figure 3(a)) and changes in commodity prices is obvious. Weaker commodity prices are associated in these countries with weakening exchange rates against the US dollar, and strengthening commodity prices with stronger exchange rates. But there is no such relationship between the Euro/US\$ exchange rate and commodity prices (Figure 3(b)).

Figure 2: % change in exchange rates and commodity prices

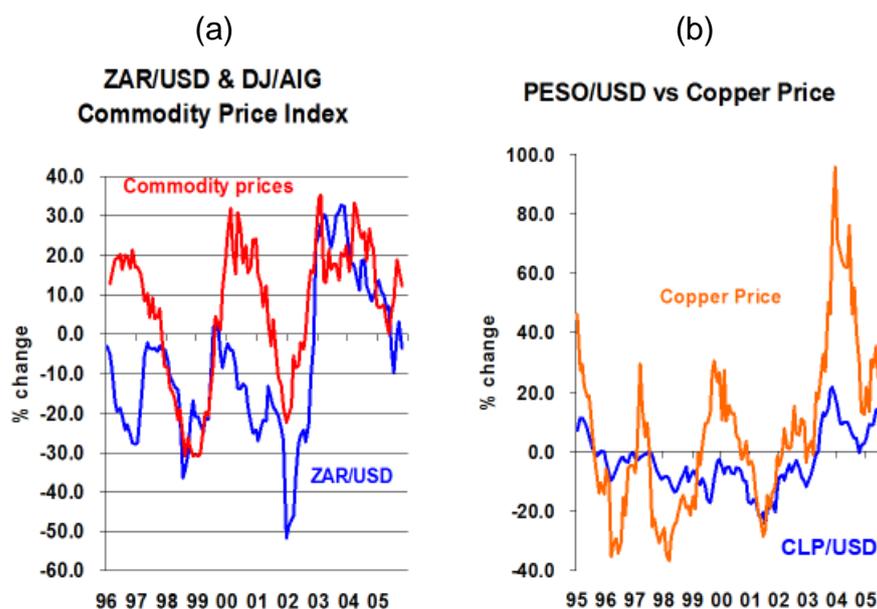
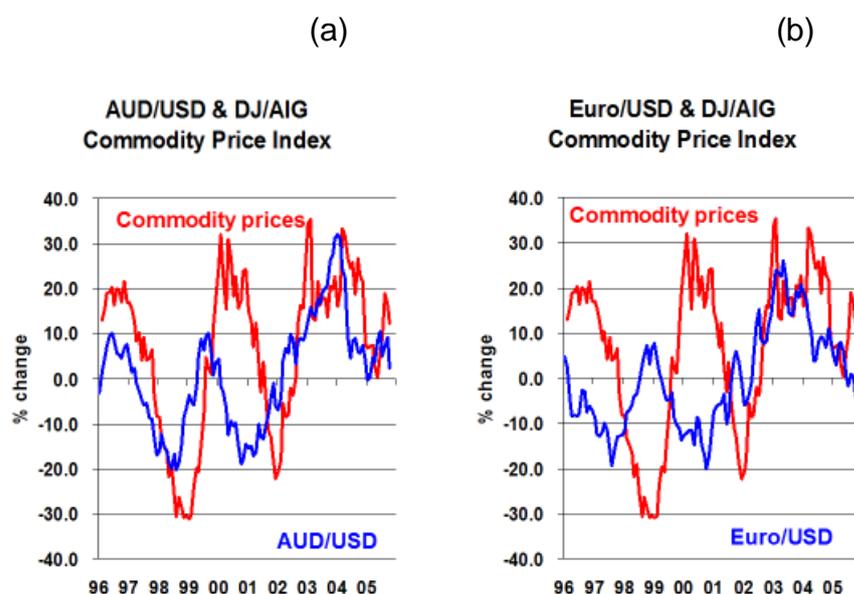


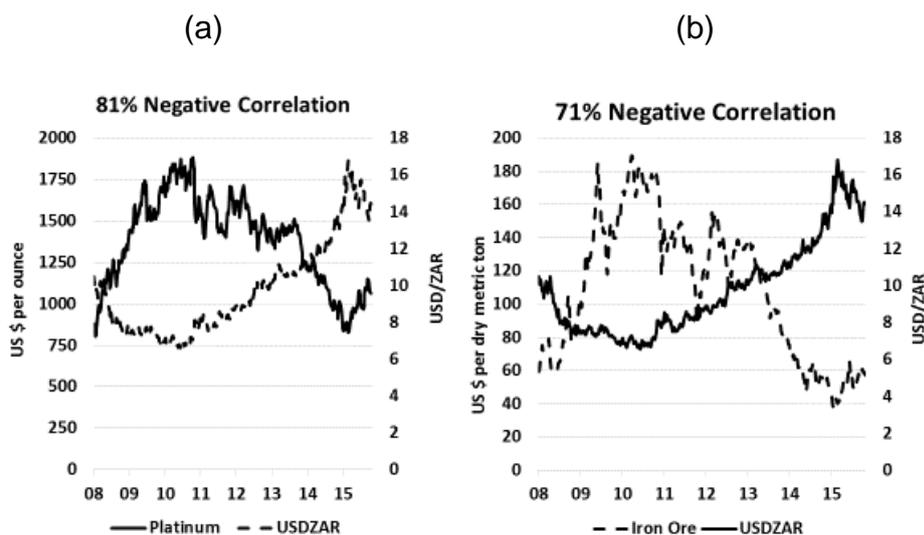
Figure 3: % change in exchange rates and commodity prices



The negative relationship between commodity prices and the exchange rates of commodity producers means that when profits are under pressure in, say, Chile because the copper price has fallen, a weaker Chilean Peso reduces operating costs in dollars, and therefore provides something of a cushion against falling prices and profits. Of course the offset is only partial. But in times of low copper prices, all other things being equal, one would rather produce copper in Chile than in a country whose exchange rate is indifferent to changes in the copper price.

This analysis is extended in Figure 4 for a more recent period (2008-2016) for South Africa. It shows that a negative relationship exists between the platinum price and the ZAR/USD exchange rate 81% of the time when measured weekly. For iron ore the negative relationship with the Rand exists 71% of the time.

Figure 4: ZAR/USD versus platinum and iron ore prices



2.2.2 Exchange rates and project returns

Exchange rates are, however, very important for the profitability of individual mines. This reality was brought home to me in 1996 when I was asked to produce a long-term forecast of the ZAR/USD exchange rate for a large greenfield mine Anglo was considering building in South Africa. How does one provide a 20- or 30-year forecast of an exchange rate as volatile as the Rand? What we did was to base our forecasts on what we thought was the sustainable long-term or equilibrium real exchange rate. We would apply some short term divergences from this long-term equilibrium based upon current circumstances. But after a year or two the forecast exchange rate would return to equilibrium and then fall in line with the difference between SA and US inflation. The mining experts then produced their forecast of

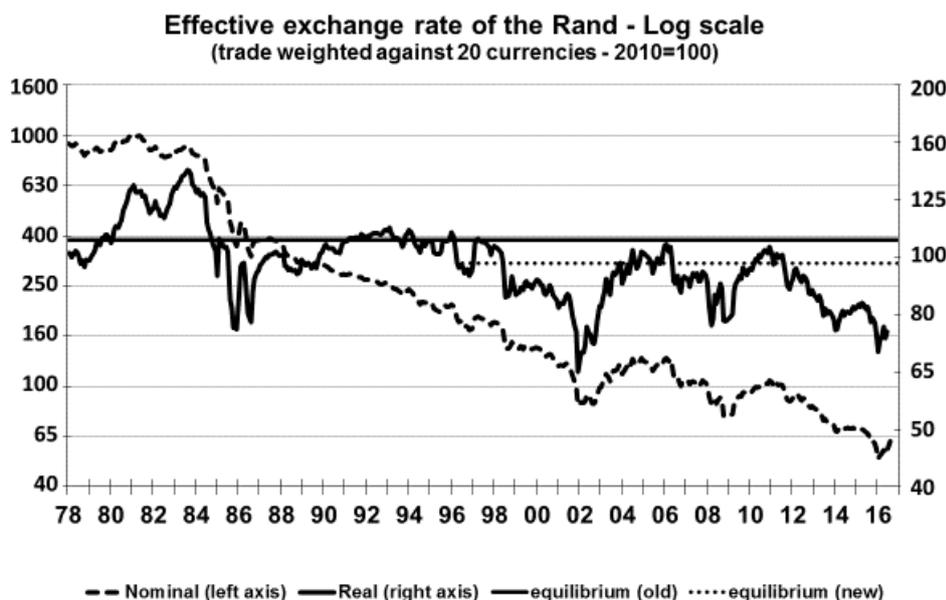
mining costs and output. Revenue and profit were then calculated from the forecast dollar commodity price and the ZAR/USD exchange rate.

In 1996 SA experienced its first post-democracy exchange rate “crisis”. Today, the falls in the Rand in 1996 appear rather minor, but at the time they were quite traumatic. My colleague and I believed that part of what had happened was an adjustment of the exchange rate to a post-Financial Rand world i.e. one in which foreigners were no longer subject to exchange rates. The artificial underpin to the Rand that had been provided by exchange controls was being removed. Accordingly, while we (correctly) believed the rand would recover some of what it had lost in early-1996, we believed the long-term equilibrium exchange rate would be about 2% weaker than we had previously forecast.

I remember very clearly then being called into a high-powered meeting and being told that as a result of the change in our exchange rate forecast, a \$1 billion project that had previously not met Anglo’s investment hurdle was now a “go”. Was I sure we were correct in weakening the exchange rate as we had done?

How could so minor an adjustment in such a volatile variable make such a difference? Well, the cost of imported capital equipment in the construction of the mine would have risen as a result of the weaker exchange rate used. But operating costs were unchanged in domestic currency and decreased by 2% in dollar terms, raising the profit margin by 2% in real terms for 30 years. The resultant difference in returns over 30 years is enormous.⁶

Figure 5: Rand - real effective exchange rate



⁶ In a hypothetical project operating over 30 years and starting with a profit margin of 20%, a 2% weakening of the real exchange rate raises the total returns in today’s money by 10%.

A look back at the real effective Rand exchange rate as illustrated in Figure 5 shows that for most of the time our 1996 forecast (equilibrium (new)) – at least against a basket of currencies - was probably quite conservative. In the event it did not actually matter as Anglo’s subsequent listing in London and the restructuring that accompanied it meant the mine was never built by Anglo and the deposit was later sold.

2.2.3 Rand volatility in SA discourages exporters from selling dollars forward

A further point about exchange rates is that the extreme volatility of the rand exchange rate soon convinced exporters that it does not pay to sell dollars forward. Selling dollars forward provides a hedge against future ZAR/USD strength. Because SA interest rates are always higher than those of the US, a forward seller can also earn the forward points that accompany hedging. The reason this is not as attractive as it sounds is because when the Rand weakens, it does so spectacularly. This means the benefits earned from selling forward while the Rand is strong are rapidly offset when the rand weakens.

Figure 6: Costs/benefits of selling forward XAR/USD

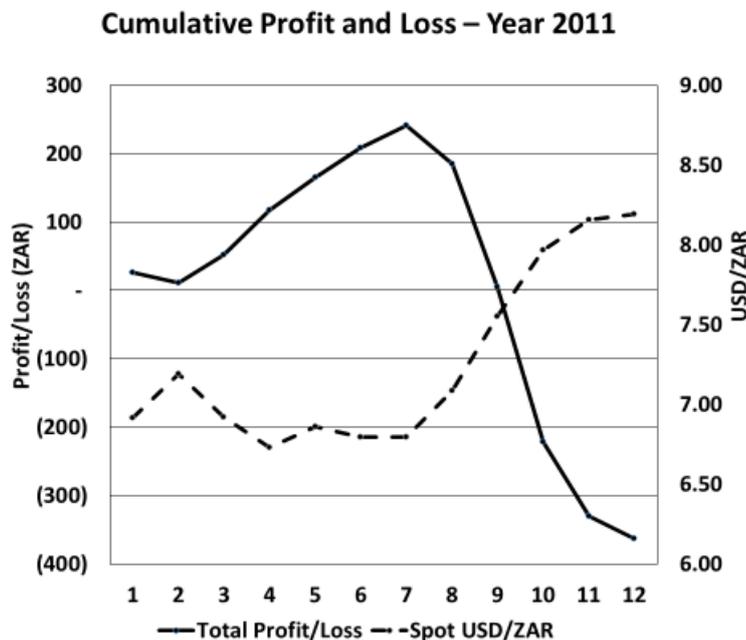


Figure 6 illustrates the consequences for an exporter in 2011 who consistently sold dollars forward instead of spot to take advantage of the forward points. It indicates that cumulative profits would be made in the first 7 months. But in the last 5 months of the year the USD/ZAR weakened significantly, which completely eroded any prior profit and resulted in a net loss as a result of selling forward. This analysis is not specific to 2011. Analysis over longer periods of time show that the profits made

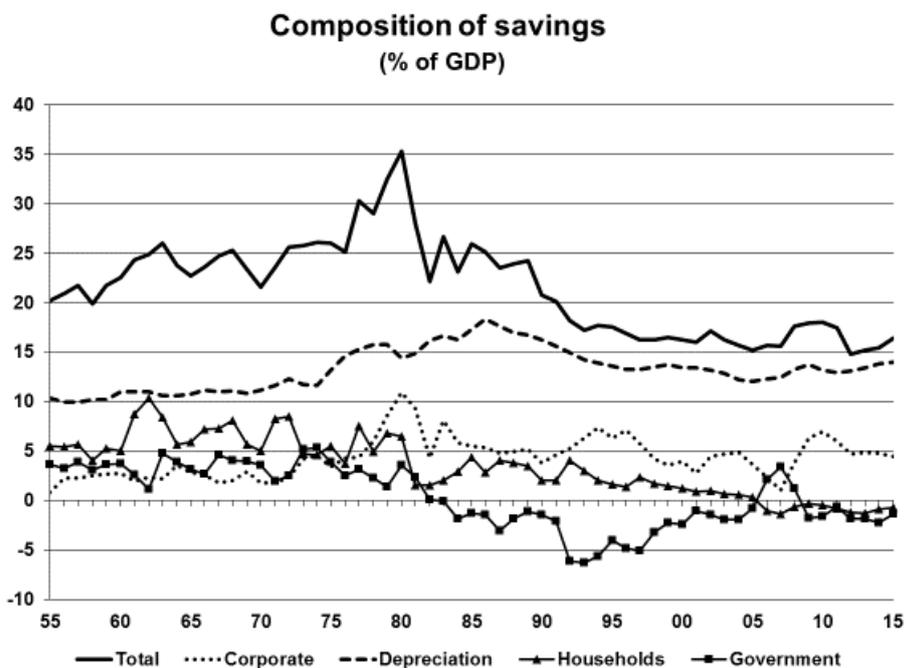
from the forward points and locking in today's spot in periods of Rand strength are consistently offset by losses when the Rand weakens.

Rand hedging therefore becomes a bet on one's ability to forecast future movements in the Rand exchange rate. Wisely, few corporates believe they have the ability to do this consistently and so most do not sell dollars forward. This outcome will change in the future only if rand volatility is meaningfully reduced.

2.3 Interest rates

A further feature of the diversified South African corporates in the 1990s was that they were often cash flush. Corporate savings via retained earnings were (and still are) unusually high in South Africa (Figure 7) at around 5% of GDP. This meant a large company like Anglo sat on a large pile of cash at the centre, which it could then use to fund expansions of wholly-owned operations. Importantly it could also act opportunistically and quickly – buying assets when prices were low, or even acquiring assets unrelated to its existing businesses when they were perceived to be cheap (e.g. the sale by Barclays Bank of its South African operations).

Figure 7: Composition of savings in South Africa



Why did shareholders not demand that this cash be paid out to them in higher dividends? Presumably, because they were mainly institutional investors who were themselves cash flush and so did not want the additional cash which they would themselves have to invest.

Anglo's cash pile was held in an entity called Central Reserves and weekly meetings were held, whose purpose was to balance the investment of this cash against

forecast inflows and outflows resulting from dividend receipts and payments and sales or purchases of any assets. Interest rates were important therefore as an investor rather than a borrower.

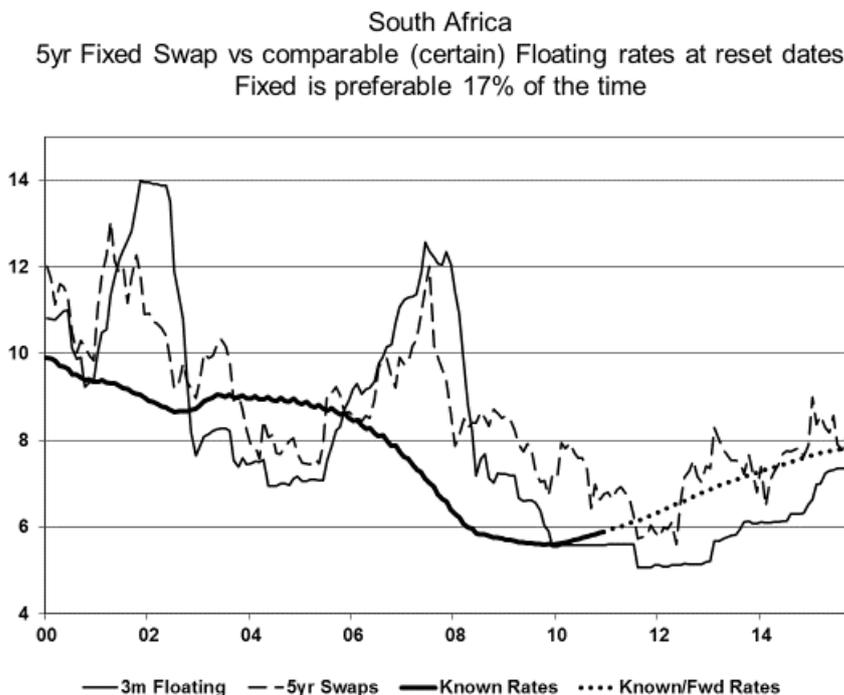
This changed post-2000. Companies like Anglo were constantly criticised by foreign investors post-1994 for having “lazy balance sheets”. This is because interest earnings are taxable while interest payments are deducted from taxable earnings. So, it was argued, rather fund investments with debt than retained earnings and pay out surplus cash to investors and let them decide where they want to invest it. In a global market there were lots of alternatives which had not existed in a closed SA market.

Following its listing in London in 1999 Anglo’s share ownership rapidly switched to London. Under pressure from these new shareholders, who were unhappy about Anglo wide spread of assets, the company went through a lengthy period of restructuring, which saw the sale of many of its industrial and financial assets. The receipts from these sales were stuck in SA because of exchange controls.

So while Anglo started to take on debt in London to expand its non-SA mining operations, its sale of SA non-mining operations (e.g. FNB) meant it continued to have a large cash pile in South Africa. Some of this was used to buy out minorities in previously listed companies and expand its shareholding in Anglo Platinum. It was also used to buy Kumba iron ore. But there was a limit to how much cash it could use in this way because agreements with the SA government to keep the companies listed, as well as BEE requirements to include minority black partners, prevented it from taking out the minorities in Kumba and Anglo Platinum.

Eventually the remaining cash was used to buy back its own shares. Borrowings were also incurred in both SA and London for the purpose of buying back Anglo’s shares. For the first time weekly meetings were now about the costs of borrowing rather than investing cash.

Figure 8: Fixed versus floating interest rates



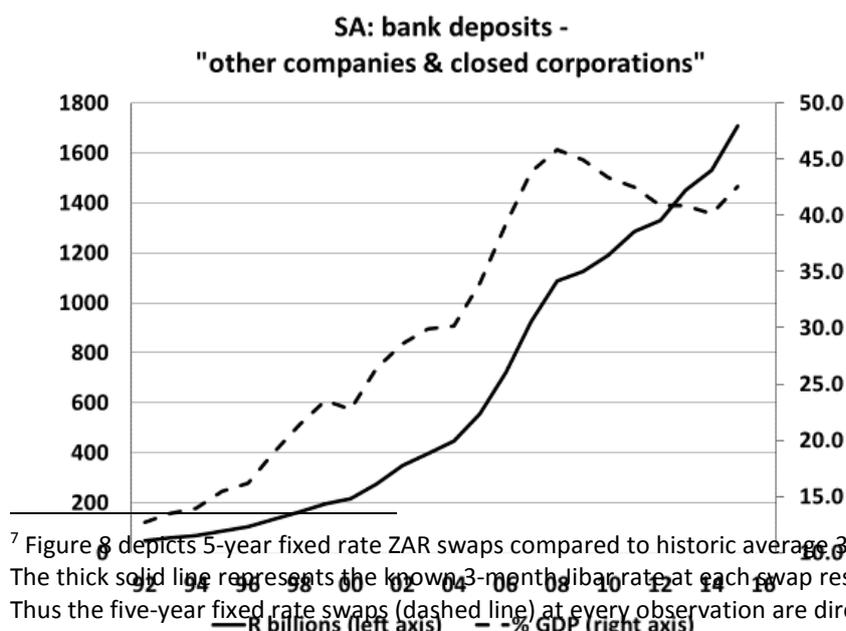
Anglo was too big relative to the SA banks to borrow meaningfully from them directly, so the pension fund market was tapped through the issuance of corporate bonds. As with the exchange rate it was better to be exposed to floating interest rates than fixed. This is illustrated in Figure 8. Fixed interest rates since 2000 are found to be preferable for a borrower only 17% of the time.⁷

Unlike the rand, however, where it is excessive volatility that discourages exporters from selling dollars forward, the preference for floating over fixed interest rates is because interest rates in South Africa are relatively stable. Under an inflation targeting regime, interest rates no longer move in large amounts (as they did in 1998), so it pays long-term borrowers to remain floating. While interest costs will sometimes rise because of this unhedged exposure, they will usually be lower over the long-term than under fixed interest rates.

3. Are SA corporates as cash-flush as is claimed?

Just as Anglo moved into a net-debt position, so claims started circulating that South African companies were becoming increasingly cash flush, with huge deposits sitting idle in their bank accounts (see Figure 9).

Figure 9: Bank deposits of “other” (non-financial) companies & closed corporations



⁷ Figure 8 depicts 5-year fixed rate ZAR swaps compared to historic average 3-month Jibar for the same period. The thick solid line represents the known 3-month Jibar rate at each swap reset date over the 5-year swap. Thus the five-year fixed rate swaps (dashed line) at every observation are directly comparable to the known floating rates (thick solid line). For the more recent swap rates the actual 3-month Jibar rates are unknown since they will only reset in the future. Actual floating rates are therefore combined with implied forward-forward rates (the dotted line) for this period. Fixed rates are lower than floating for 20% of this extended period.

This claim has important political and economic dimensions in SA. For critics of capitalism this is seen as evidence of an “investment strike”. Unpatriotic, white-controlled, companies, it is claimed, are refusing to invest in South Africa because they are hostile to a democratic government. Critics of government, in contrast, argue that the large cash holdings are proof that government’s policies are unfriendly to invest. Business, they claim, is itching to invest its large cash pile, if only government would introduce more investment-friendly policies that allow them to invest the cash.

Johan van Rooyen of the SA Reserve Bank has pointed out that even if business is investing the cash pile will not fall. It will simply move from the businesses who are investing to the businesses supplying the investment inputs. Even if the capital equipment is imported the cash will simply move between the accounts of importers and exporters.

However, I want to question whether the cash actually exists? Or at least whether it exists in the form that the current debate suggests i.e. large deposits of idle cash sitting in company bank accounts, waiting to be spent one day? Figure 7 showed that SA companies are indeed large savers. But they were equally large savers historically, without their “cash-pile” reaching anything like the levels claimed today.

Figure 9 shows the reported bank deposits of “other” (non-financial) companies and closed corporations. These have grown from R49 billion in 1992 to R1 709 billion in 2015. As a share of GDP these deposits have risen from 12.7% to 42.6% of GDP over the same period, and peaked at 45.9% of GDP in 1998. It is hard to believe that such an increase could represent the changing cash flow needs of businesses. It is these deposits that have led to the accusations of an “investment strike” and the counter claims of large amounts of cash “waiting to be invested” if policies improve.

As Anglo adjusted to a world of debt, I jokingly told my colleagues Anglo should buy some of the companies who own all that cash so that we could pay back our borrowings. Who were these companies? Because of the increasing political dimensions of the alleged cash pile, a colleague in corporate finance scoured the financial statements of the 40 largest listed companies on the JSE and could find no evidence that SA’s largest companies were sitting on large amounts of cash.

In 2014 an Honours student at Rhodes repeated this study.⁸ He found that some companies have quite large amounts of cash – for example MTN and Sasol. But much of the cash on MTN’s balance sheet is not in SA and Sasol has an aggressive investment programme which will absorb most of its cash.

⁸ Fitzgerald, T. (2014). Are South African companies holding large piles of cash? Unpublished Honours Research Paper. Rhodes University, Grahamstown.

Importantly, he found that the cash of 27 of the JSE Top 40 companies⁹ makes up only 13-16% of the bank deposits¹⁰ reported in the Reserve Bank’s Quarterly Bulletin. In an economy which is unhealthily dominated by large companies, is it really possible that a cash pile equal to more than 40% of GDP could be held mainly by medium-sized and small companies?

Figure 10: Cash of JSE top 40 companies as % of deposits of “other companies & closed corporations”¹¹

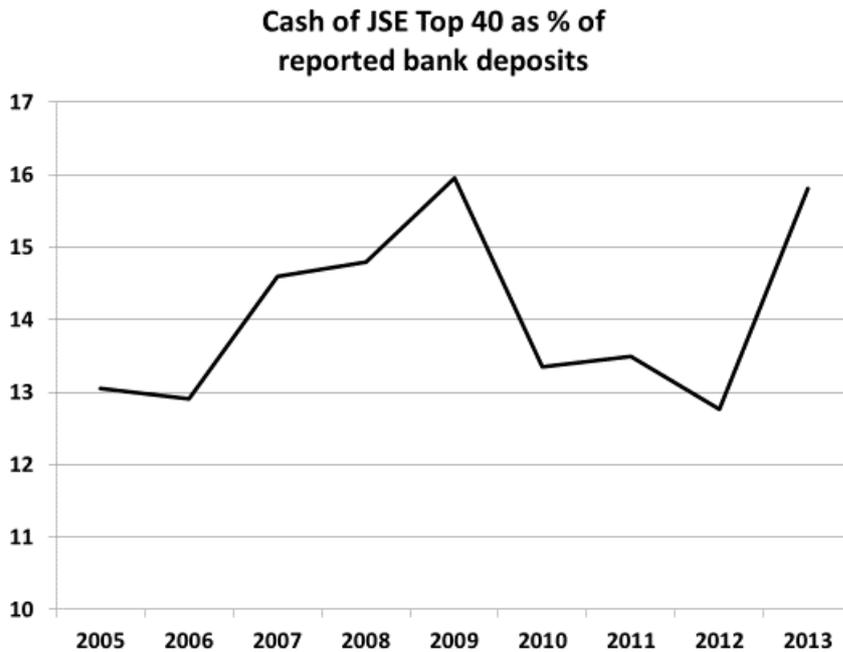
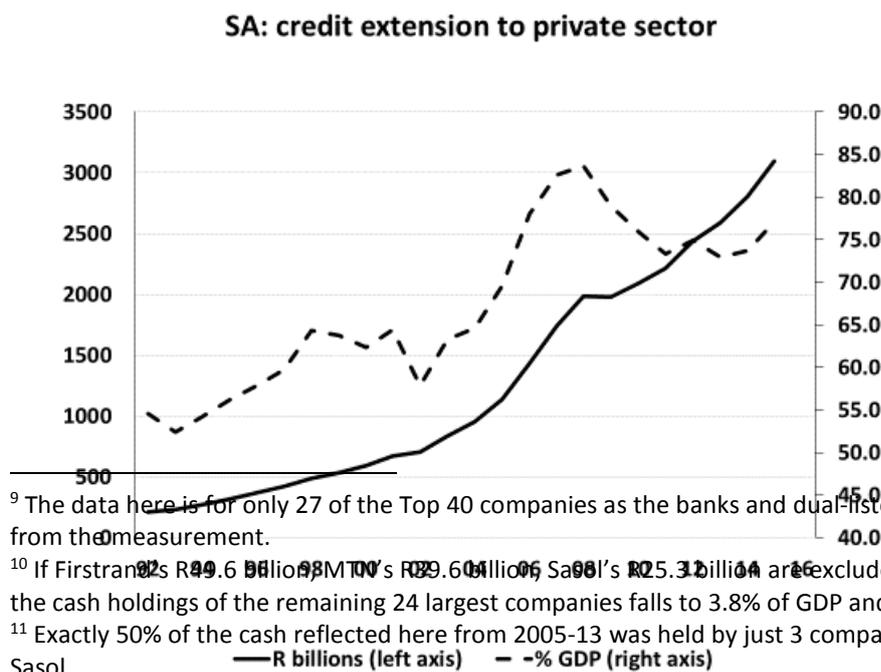


Figure 11: SA - private sector credit extension



⁹ The data here is for only 27 of the Top 40 companies as the banks and dual-listed companies were excluded from the measurement.

¹⁰ If Firststrand’s R49.6 billion, MTN’s R29.6 billion, and Sasol’s R25.1 billion are excluded from the 2013 calculations, the cash holdings of the remaining 24 largest companies falls to 3.8% of GDP and to 7.9% of bank deposits.

¹¹ Exactly 50% of the cash reflected here from 2005-13 was held by just 3 companies – Firststrand, MTN and Sasol.

Why are shareholders not calling for bigger dividend payments if companies are sitting on idle cash? Why, too, if companies are so cash flush, has company borrowing increased rapidly and as a share of GDP (Figure 11)? Of course, it might be that the companies who are borrowers are those who do not have cash. But given the extent of the growth in both the bank deposits and credit extension variables, something seems amiss.

More research is needed. Given the political and potential policy implications, it is important that we know exactly what is going on.

4. Conclusion

The observations in this paper were made for a large, diversified South African group, and would not necessarily all have been true for smaller, more focused companies. Some conclusions were, however, applicable to all companies, whatever their size and product mix. All exporters face the reality that if they consistently sold dollars forward they would have made large losses when the highly volatile Rand exchange rate weakened. All borrowers would pay more for fixed interest rates than floating most of the time.

However, the implications of these findings might be different. At times when the Rand exchange rate is relatively strong, a small exporter may be unable to risk even a relatively short period during which the Rand exchange rate strengthens even further. The available forward points might be the difference between making a profit or loss. Without the large balance sheet of a major corporate, such differences may be the difference between survival and closure. Selling forward is then prudent behaviour. Likewise, a borrower may not be able to survive a period when flexible interest rates rise. Paying more for fixed rates is therefore also prudent.

The discussion on the dramatic increase in the bank deposits of South African companies in recent years does not suggest that the published figures are wrong. Clearly South Africa's banks know how large are their deposits and who are the owners of these deposits. What is being questioned is whether these deposits are idle cash as is often claimed. The answer to this question is important as it has significant analytical and policy implications for South Africa.