

## Determining a fair value for the rand exchange rate

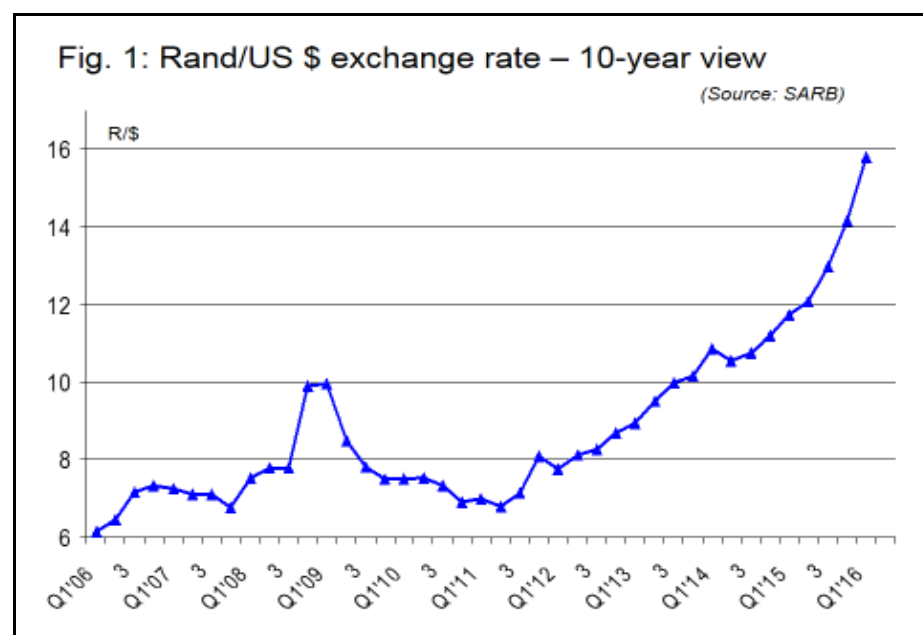
By Dr Roelof Botha, Economic Advisor to PricewaterhouseCoopers  
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### 1 Background

The background to this study relates to a request from Martin Hopkins (partner, PricewaterhouseCoopers) to assist the firm's clients with a greater understanding of the key factors influencing the rand exchange rate, as well as an overview of recent and historical exchange rate trends.

Until 2015, the South African currency followed the general trend of relative weakness against the US dollar, due mainly to emerging market risk aversion in global capital markets and record low bond yields in the Euro area.

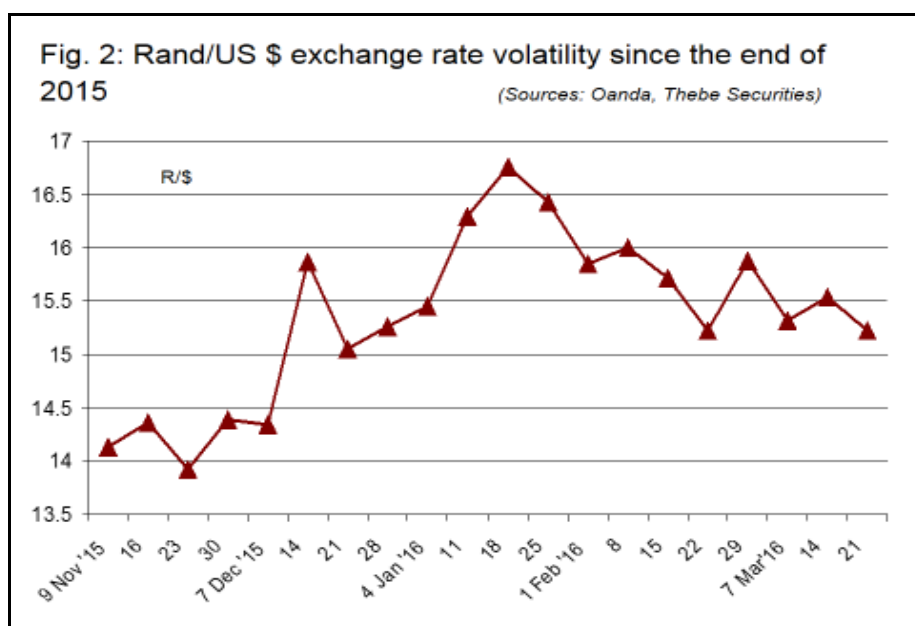


Since especially the end of 2015, however, the rand has moved out of synchronisation with most of its key trading partners, a trend that seems to be related to weak economic growth prospects, a lack of economic policy direction and a measure of socio-political instability. The worsening state of the rand exchange rate is aptly illustrated by figure 1, whilst figure 2 depicts the sharp depreciation that occurred in the week of 10 December and the short-term volatility that has ensued.

The exercise of presenting a forecast for an emerging market exchange rate is obviously fraught with difficulties, as the factors that impact on currency markets are not always quantifiable.

In South Africa's case, table 1 provides an indication of the range of indicators that influence the rand exchange rate (both from a macroeconomic and socio-political perspective).

This study will focus on determining the level of undervaluation of the rand exchange rate that currently exists and reasons for the recent widening of the gap between its nominal and purchasing power parity (PPP) value.



<b>Table 1: Key factors influencing the rand exchange rate</b>	
<b>International trade</b>	<ol style="list-style-type: none"> <li>1. Current account balance</li> <li>2. Ratio of service &amp; income receipts to goods exports</li> <li>3. Financial account balance</li> <li>4. Unrecorded transactions</li> <li>5. Special Drawing Rights &amp; valuation adjustments</li> <li>6. Foreign exchange reserves</li> <li>7. Ratio of foreign liabilities to foreign assets</li> <li>8. Leads and lags in trade payments</li> </ol>
<b>Other macroeconomic variables</b>	<ol style="list-style-type: none"> <li>1. Ratio of foreign debt to GDP</li> <li>2. International liquidity position of the central bank</li> <li>3. Global economic growth trends</li> <li>4. Domestic economic growth trends</li> <li>5. Short-term interest rate</li> <li>6. Bond yield</li> <li>7. Inflation differentials with trading partners</li> <li>8. Trade policy</li> </ol>
<b>Socio-political stability</b>	<ol style="list-style-type: none"> <li>1. Commitment by government to market principles</li> <li>2. Socio-political stability</li> <li>3. Regional socio-political stability</li> <li>4. Emerging market risk aversion</li> <li>5. Global competitiveness rankings</li> </ol>

## **2 Methodology and results**

### 2.1 Real effective exchange rate

The real effective exchange rate of the rand (REER) was the focus of the first section of the study, which automatically provides a clear indication of the extent to which the South African currency is under- or overvalued (due to the use of indexation

technique). A REER may be defined as an inflation-adjusted value of a particular country's currency against a trade-weighted basket of currencies of key trading partners.

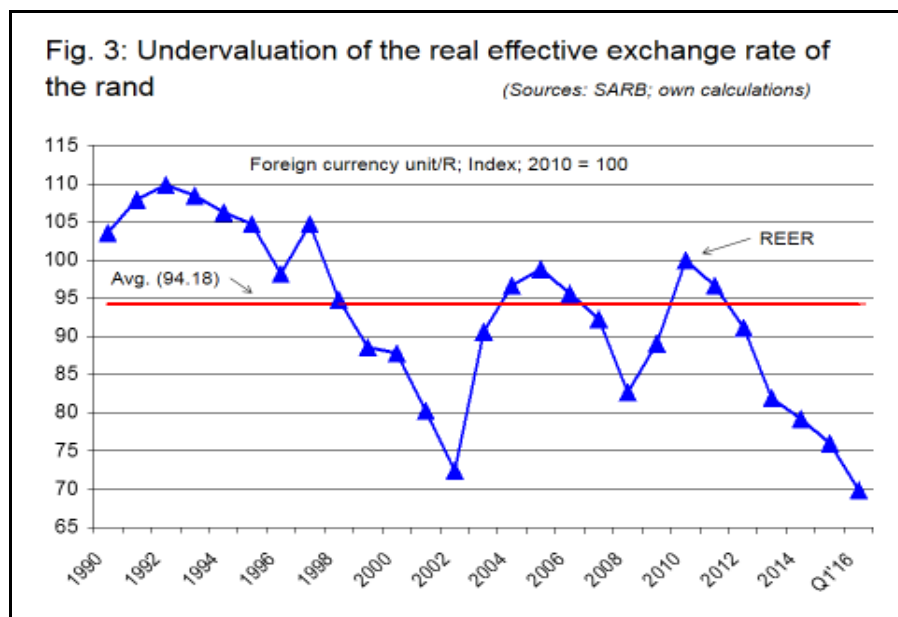
In South Africa's case, five currencies contribute more than 75% of this basket, namely the Euro, US dollar, Chinese yuan, Japanese yen and UK pound.

The index is, however, calculated as a percentage change from a particular base year, which does not necessarily coincide with a year when the rand was fairly valued (in terms of purchasing power parity – PPP).

In order to rectify this situation, the long-run (30 years) average REER was juxtaposed with the different time-series values, thereby illustrating the periods during which the rand was under- and overvalued, as well as the extent of the variance from the long-run average.

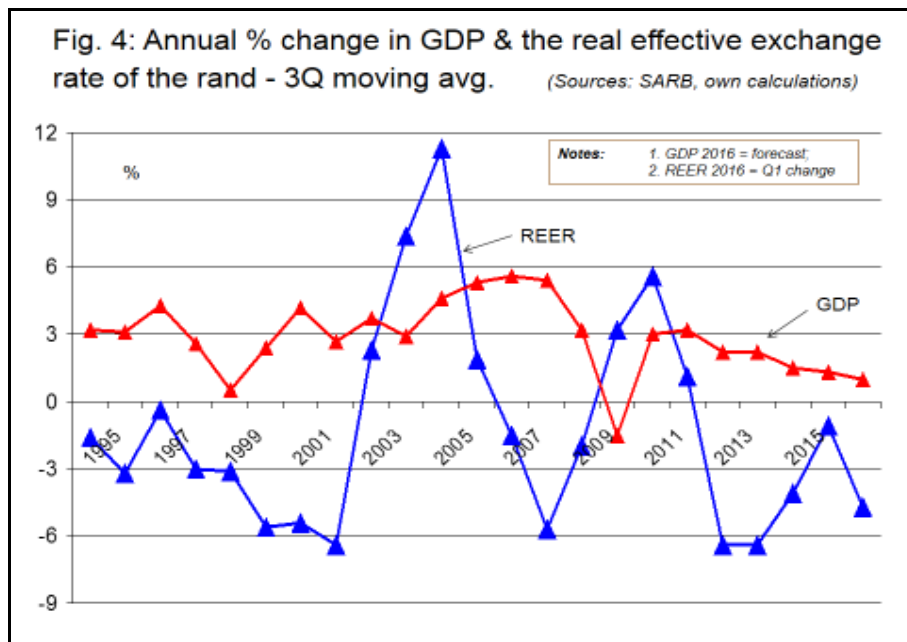
The result of this analysis is depicted by figure 3, clearly indicating a substantial degree of volatility in the value of the South African currency over the past 16 years.

A further conclusion is that the rand has enjoyed three periods of overvaluation since 1990, but tends to always overshoot its "fair value" (as determined by the long-run average index value of 94.18).



As at 21 March 2016, the above analysis yields a level of undervaluation of 25.7% (in terms of the price of the rand in the REER's weighted average foreign currency unit).

Figure 4 attempts to find a correlation between the REER (three-quarter moving average) and the economy's real growth rate, but there is clearly no short- to medium-term predictability between these two indicators. The rand depreciated fairly sharply between 2005 and 2007, despite the economy recording exceptionally high growth rates.



The rand was overvalued during and immediately after the recession of 2008/09, but has since defied these inverse causalities and has weakened as the economic growth rate started declining. Since 2012, the commodity cycle slump has tracked the weakening rand (to some extent).

## 2.2 Real exchange rate against the US dollar

Due to the hypothetical nature of the REER and the fact that its value masks the simultaneous occurrence of strengths and weaknesses against different currencies, a second section of the study was devoted to the determination of the rand's value against the US dollar.

This currency was chosen for a number of reasons, including:

- The US remains the largest economy in the world and enjoys a so-called demographic dividend, relating to positive population growth, thereby securing consistent increases in aggregate demand and the supply of labour to the economy
- The US remains South Africa's largest trading partner in terms of diversified exports with a relatively high value added content
- The US dollar is destined to remain fairly stable over the long-run, due, *inter alia*, to relatively high capital market interest rates (compared to high-income countries), a structural reduction in its oil import propensity and an apparent structurally higher GDP growth trajectory than the European Union.

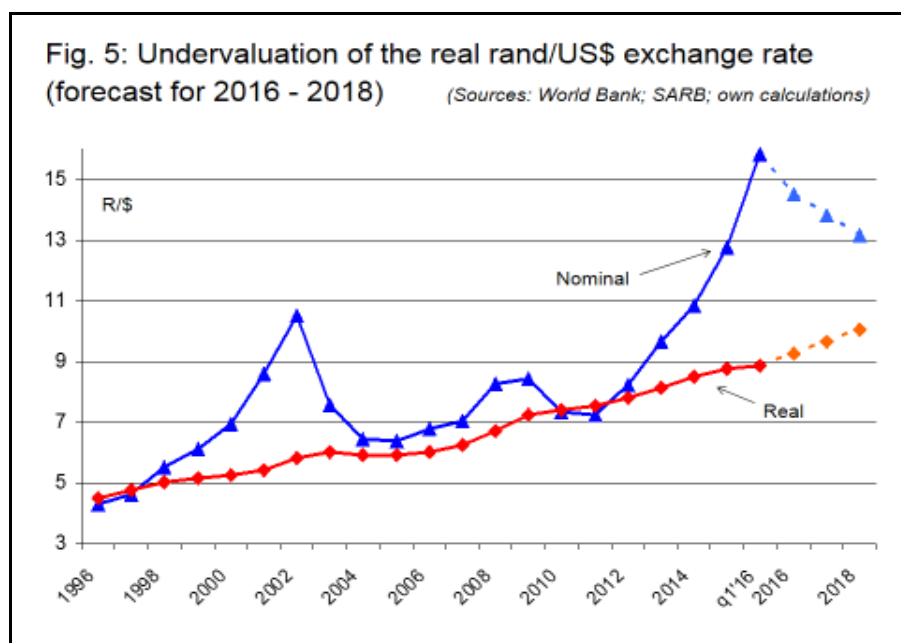
The nominal rand exchange rate was juxtaposed with the real exchange rate, i.e. after adjustment for inflation differentials. It should be pointed out that a country which has a higher rate of inflation than a particular trading partner should experience an

equivalent exchange rate depreciation, in order for purchasing power parity to be maintained, and vice versa.

The choice of a base year is crucial to this analysis and 1996 was chosen by virtue of its close correlation with the long-run REER. The assumption is therefore made that the rand/US\$ exchange rate was fairly valued in 1996.

The next step involved the determination of the inflation differentials between the two countries and the coefficient required to convert the nominal exchange rate to the real exchange rate (at fair value).

Figure 5 and table 2 depict the results of this analysis, which also includes a forecast for the rand/US dollar exchange rate until 2018. According to this calculation, the nominal rand exchange rate was undervalued by 44% as at the third quarter of 2016.



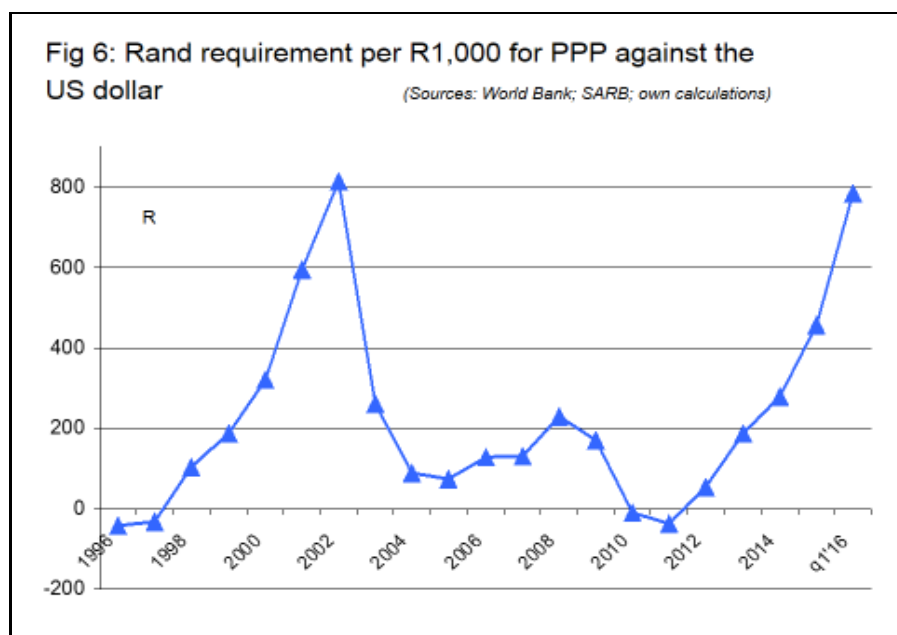
The basis underpinning this forecast is, firstly, an annual strengthening of the nominal exchange rate equal to that achieved during the previous two periods of recovery from an under-valued position (2002 to 2005 and 2009 to 2011). Secondly, the real exchange rate is expected to decline by inflation differentials of 4.5%, 4.3% and 4.1%, respectively, between 2016 and 2018.

The result of this anticipated claw-back of the rand is a level of under-valuation in 2018 of 23.8% - a substantial improvement on the current level of under-valuation.

Figure 6 provides the amounts (in rand terms), by which an income of R1,000 needs to be supplemented (or reduced) in order to obtain PPP, based on the levels of under- and over-valuation determined in table 2. It is fairly clear from this analysis that the rand was significantly undervalued between 2000 and 2002 and again currently (since 2014). For most of the other 15 years since 1996, the rand was either overvalued or only modestly undervalued against the US dollar.

**Table 2: Calculation of the differential between the nominal and real R/\$ exchange rate and the purchasing power parity gap**

	Nominal exchange rate		Inflation differential	Real R/\$ exchange rate	Required for PPP per R1,000	
	R/\$	\$/R			\$	R
2000	693.5	0.144	1.019	5.25	46	320
2001	860.3	0.116	1.027	5.40	69	594
2002	1051.7	0.095	1.075	5.80	77	813
2003	756.5	0.132	1.035	6.00	34	260
2004	645.0	0.155	0.987	5.92	14	89
2005	636.2	0.157	0.999	5.92	12	75
2006	676.7	0.148	1.014	6.00	19	129
2007	705.4	0.142	1.042	6.24	18	130
2008	825.2	0.121	1.076	6.72	28	228
2009	843.7	0.119	1.074	7.22	20	169
2010	732.2	0.137	1.025	7.40	-1	-10
2011	725.3	0.138	1.018	7.53	-5	-37
2012	821.0	0.122	1.035	7.79	7	53
2013	965.0	0.104	1.042	8.12	20	188
2014	1084.4	0.092	1.044	8.48	26	279
2015	1275.1	0.078	1.034	8.77	36	455
Q1'16	1582.0	0.063	1.011	8.86	50	785
2016	1450.0	0.069	1.044	9.25	39	567
2017	1381.0	0.072	1.042	9.64	31	432
2018	1316.0	0.076	1.040	10.03	24	312



### 3 Reasons for the rand's weakness

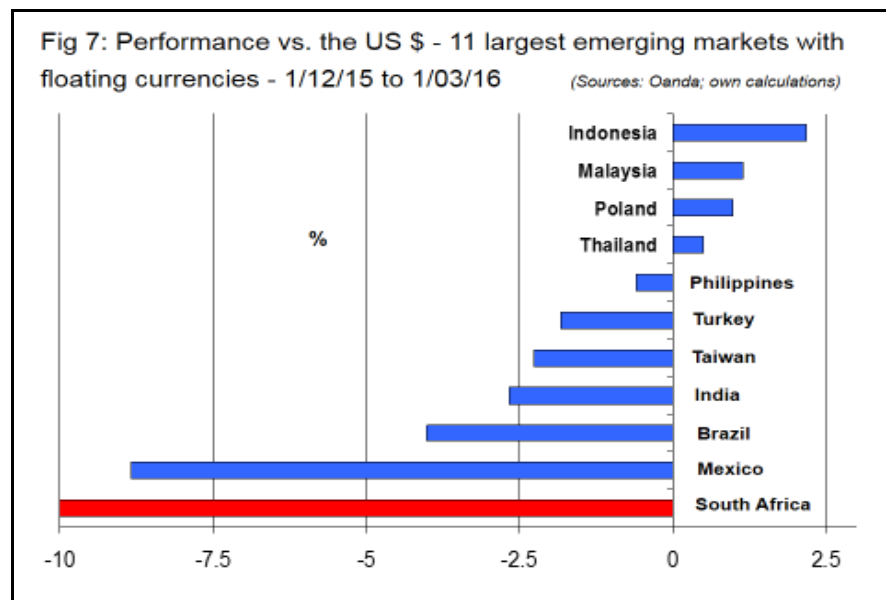
As indicated earlier, until recently, rand weakness was more or less confined to a shift in portfolio investment flows away from emerging markets to US bonds & equities. This trend occurred mainly as a result of higher rates of return on investments in the world's largest economy, combined with fears over the extent of the Chinese slowdown and its negative impact on other emerging markets.

An extended commodity cycle slump, which has entered its sixth year, has contributed to a degree of global investment aversion towards emerging markets in general and commodity exporters in particular.

A third key reason for the sharp depreciation of the rand exchange rate since December last year is related to the political uncertainty caused by president Zuma's decision to dismiss Finance Minister Nhlanhla Nene and replacing him with the relatively unknown David van Rooyen (an ANC Member of Parliament).

Mr Trevor Manuel, a former finance minister, joined the ranks of a chorus of domestic and international critics of this move by stating that the saga of dismissing a competent minister in a pivotal portfolio without warning or explanation had led to a breakdown in trust, not only within Cabinet, but also with the broader South African electorate, business leaders and the markets.

Mr Nene's dismissal was met with a steep decline in the value of the rand, resulting in the off-loading of South African bonds and equities by fund managers around the globe. None of the currencies of the eleven largest emerging markets (with floating exchange rate regimes) performed as poorly as the South African rand over the three months between 1 December 2015 and 1 March 2016, as illustrated by figure 7.



An element of stability has nevertheless been achieved in the aftermath of the re-appointment of Mr Pravin Gordhan as Minister of Finance, with a significant claw-back of the domestic currency in mid-December and also end-January (see figure 2).

During the first half of January, however, the rand once again started following the trend of several other emerging markets, namely a gradual loss of value against the

US dollar, due mainly to concerns over the continued negative impact of the commodity slump on global economic growth prospects.

The rand exchange rate nevertheless started recovering some lost ground since mid-January and was 10% stronger on 21 March than two months earlier, despite a large measure of volatility over this period.

The impact of the uncertainty created by the tampering with the executive head of South Africa's National Treasury should not be under-estimated.

Apart from the large and obvious reduction in the market value of South African bonds (both in domestic and foreign currency terms), a significant element of the rand's depreciation since December 2015 can be ascribed to this unfortunate event.

Most of the commentary surrounding Mr Nene's dismissal suggests that it was prompted by National Treasury's apparent disapproval of Cabinet's plans to secure 9,600 Mw of nuclear power capacity (at a current estimated capital cost of more than R1 trillion and an estimated energy cost per Kwh that could be a multiple of alternatives such as gas-to-electricity).

Table 3 presents a calculation of the extent to which recent rand weakness can be ascribed to the political uncertainty surrounding the Nene dismissal. This translates into a depreciation of 7.53% over and above that which can be objectively attributed to the strength of the US dollar between 1 December 2015 and 1 March 2016.

**Table 3: Calculation of the politically-induced component of the rand's depreciation between 1 December 2015 and 1 March 2016**

	US\$/currency unit		% change in currency/\$	GDP 2015	GDP-weighted change (%)
	1 Dec'15	1 March'16			
India	66.58	68.41	-2.67	2 183	-0.67
Brazil	3.827	3.987	-4.01	1 800	-0.83
Mexico	16.60	18.21	-8.83	1 161	-1.17
Indonesia	13643	13351	2.19	873	0.22
Turkey	2.92	2.97	-1.82	722	-0.15
Taiwan	32.51	33.26	-2.26	519	-0.13
Poland	4.03	4.00	0.98	481	0.05
Thailand	35.81	35.63	0.50	374	0.02
Malaysia	4.25	4.21	1.15	313	0.04
Philippines	47.11	47.40	-0.60	299	-0.02
					%
Mean average depreciation					<b>-1.54</b>
GDP-weighted average depreciation					<b>-2.64</b>
South African currency depreciation					<b>-10.17</b>
Difference induced by political uncertainty					<b>-7.53</b>

**Note:** Analysis covers the 10 largest emerging markets with floating currencies

**Sources:** Oanda; IMF; own calculations

When considering South Africa's import bill, the politically-induced depreciation of the rand translates into R8.9 billion more that is paid for the imports of goods and services every month (as long as this element is present).

This obviously places further pressure on the country's balance of payments and will tend to aggravate currency weakness until the so-called "automatic stabiliser" kicks in. The latter refers to the reversal of currency weakness that eventually follows from lower imports (due to prices that become inhibitive in domestic currency terms) and higher export earnings (in domestic currency terms).

#### 4 The role of the gold price

Any meaningful analysis of the rand exchange rate needs to take cognisance of the gold price. Table 4 clearly shows a strong medium-term correlation between these two indicators, a phenomenon that has regularly repeated itself for more than half a century.

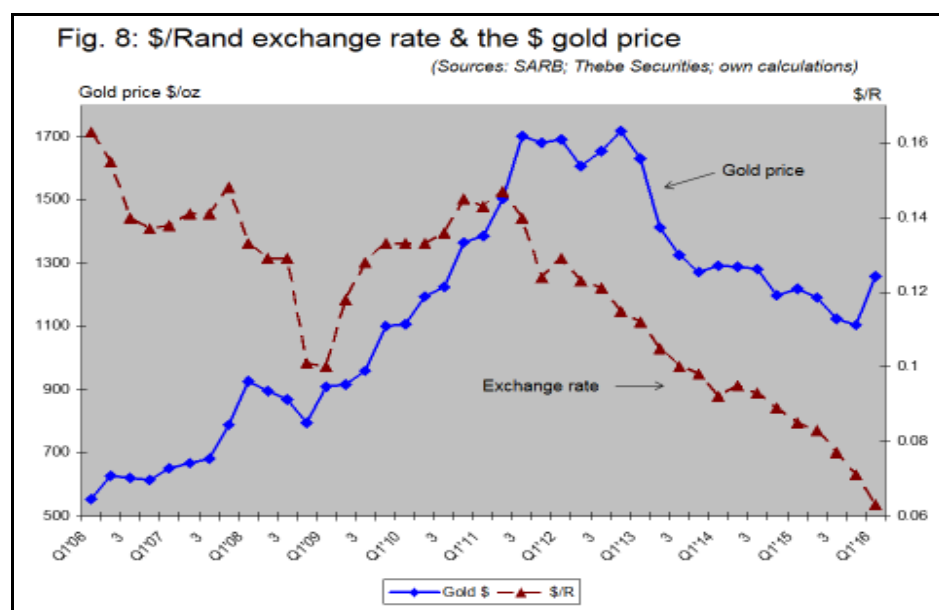
**Table 4: Correlation between the gold price & exchange rate (% change over the medium-term)**

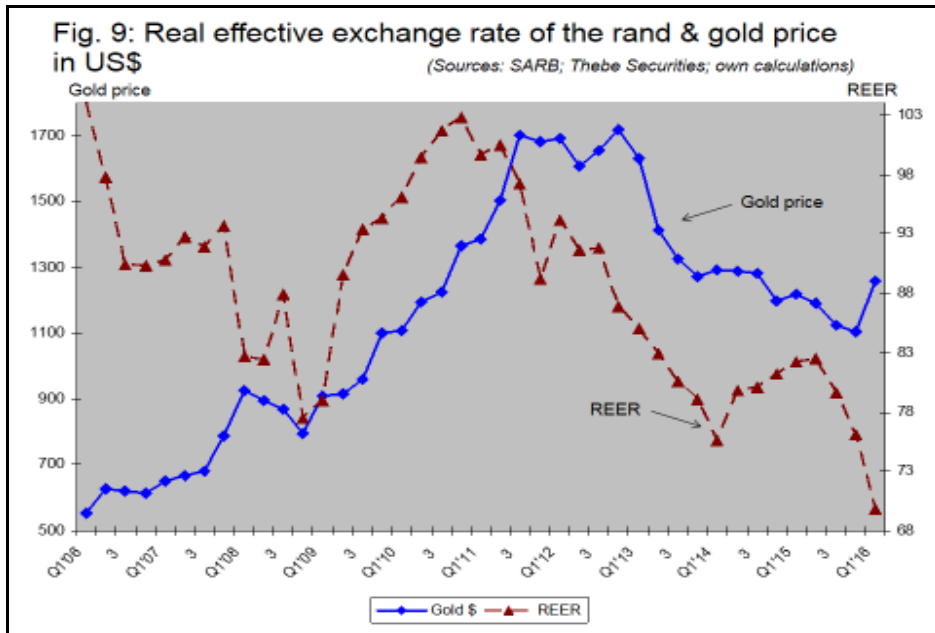
		%
Q3 2011 - Q4 2015	Gold price in \$	-26.7
	REER (of the rand)	-24
Q2 2010 - Q4 2015	Gold price in rand	88.9
	Rand/\$	88.8

**Note:** REER = Real effective exchange rate

**Sources:** SARB; own calculations

As a rule of thumb, the lower the dollar gold price, the weaker the rand becomes and vice versa, although this convergence is often subjected to a time-lag of several quarters. Figures 8 and 9 provide an early indication that the gold price may have entered the early stages of a renewed upward phase of the commodity cycle for metals & minerals, confirming the prospect for a meaningful recovery of the rand exchange rate over the medium to long term.

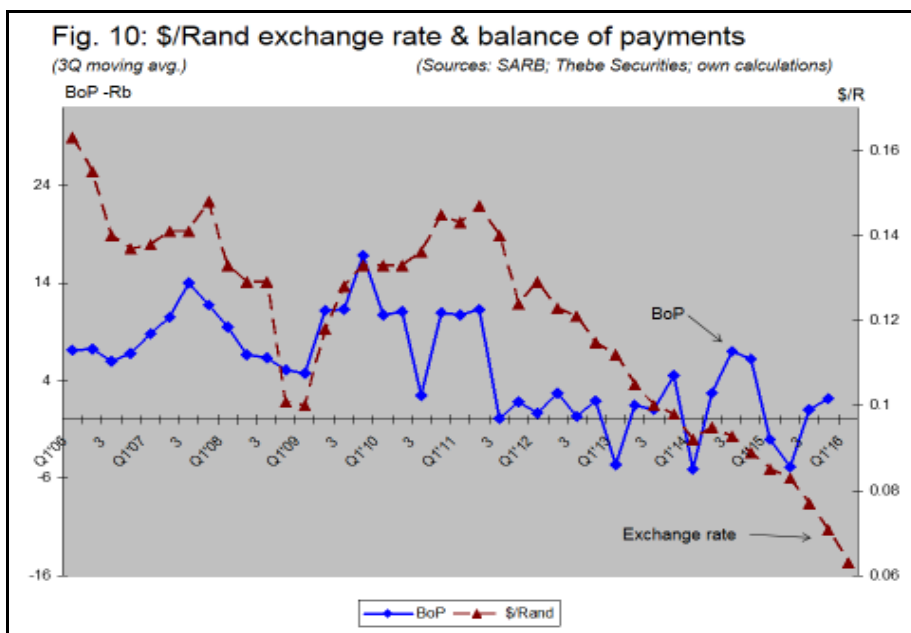




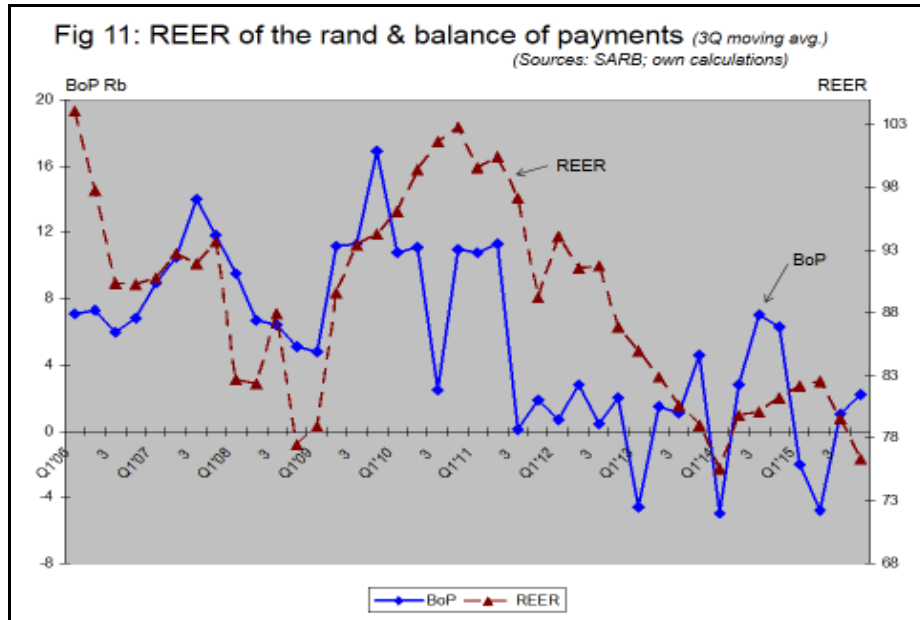
## 5 The role of the balance of payments

In an ideal world of stable, free enterprise democracies, conventional theory holds that a country's nominal exchange rate will be determined by international trade flows alone.

Due to the expansion over the past three decades of democratic political systems, free enterprise principles and world trade flows, it is not surprising that changes to a country's foreign exchange reserves exhibit relatively strong causalities vis-à-vis its exchange rate (unless the latter remains pegged to a particular currency or otherwise regulated by central banks).

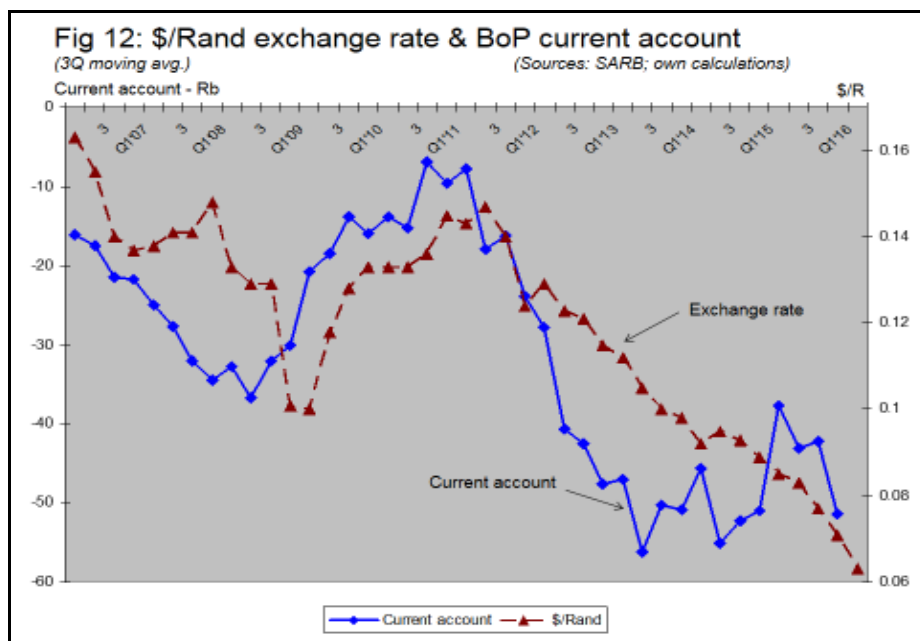


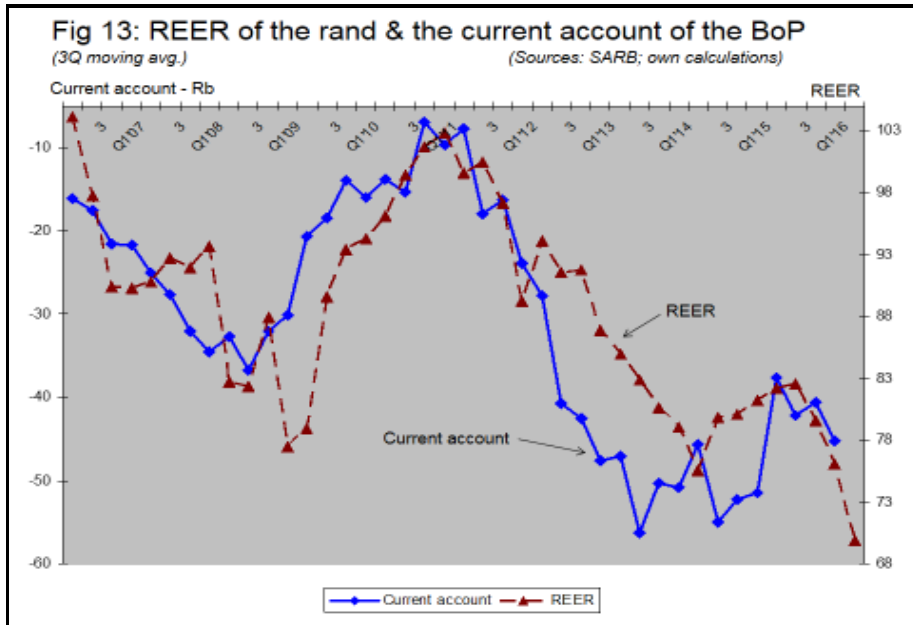
Figures 10 and 11 present an overview of the relationships between the rand exchange rate (in nominal terms against the US dollar and in real effective terms) and the overall balance of payments. In order to eliminate the traditional short-term volatility experienced with balance of payments flows, the latter has been expressed in terms of a three-quarter moving average.



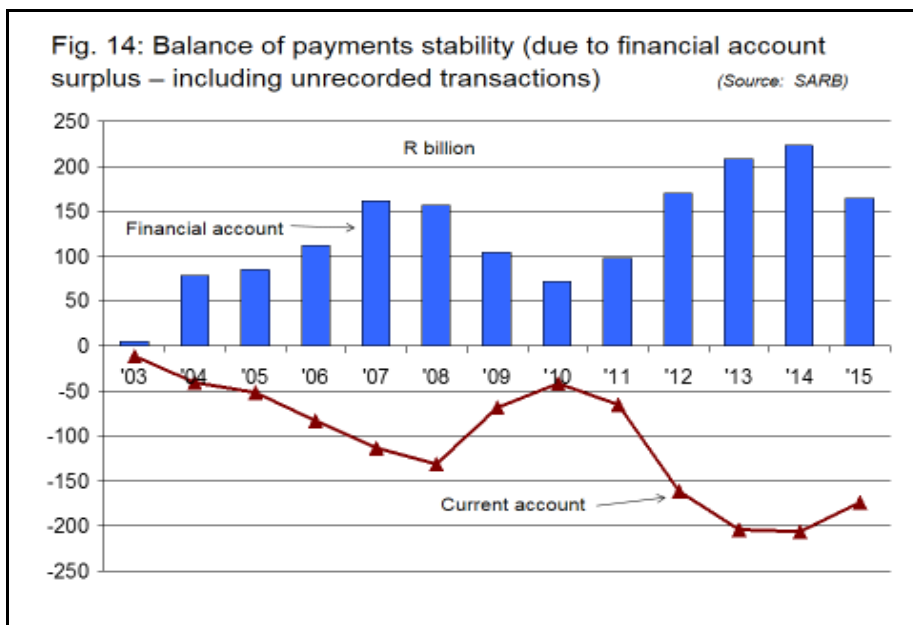
Figures 12 and 13 isolate the relationships between the nominal and real rand exchange rate and the current account of the balance of payments. It is clear that both these currency values are fairly closely correlated with the net effect of imports and exports of goods and services.

This is not entirely surprising, as the combined value of such trade amounted to R2.5 trillion in 2015, representing the bulk of the demand for and supply of foreign exchange in South Africa.





The performance of the country’s financial account during the post-democratic era has been quite remarkable, with a net cumulative inflow of portfolio, direct and other foreign investment of more than R1.6 trillion – including unrecorded transactions (since 2004).



It is clear from figure 14 that South Africa enjoys a large degree of stability with regard to the balance of payments, with a long-standing mirror image relationship between a current account deficit and a financial account surplus.

The existence of overall balance of payments stability suggests that foreign exchange markets have been placing undue emphasis on South Africa’s current account deficit.

This trend may be reversed soon, in the event of the following factors being taken into account:

- A steadfast 2016/17 national budget presented to Parliament in February by finance minister Pravin Gordhan, which managed to contain the budget deficit at marginally above 3% of GDP and the total public debt at below 50% of GDP
- South Africa's inclusion in the Citigroup World Government Bond Index, which only features four emerging markets (Mexico, Singapore and Malaysia are the other three) and which guarantees inflows of so-called tracker funds on the financial account of the balance of payments
- A bond yield of marginally above 9%, which continues to attract inward foreign portfolio investment (comparable bond yields for Japan, Germany and the US are 0.05%; 0.27% and 1.78%, respectively – as at March 2016).

## Conclusion

Most of the evidence provided in this study suggests that the South African currency was grossly under-valued during the first quarter of 2016, a trend that started in 2013 and gained momentum after the shock dismissal of the country's erstwhile finance minister, Nhlanhla Nene.

Rand weakness is nevertheless also related to a general declining exchange rate trend exhibited by emerging markets, especially commodity exporters that have encountered balance of payments pressure due to a combination of weak global growth, structurally lower growth in China and a lengthy commodity cycle downturn.

As a result, fund managers have been loath to invest heavily in emerging market bonds, which have a permanently higher risk profile than post-industrial economies, despite the promise of high returns (at least in nominal terms).

A healthy differential between the US bond yield and that of most countries in the Euro area has also underpinned US dollar strength in recent years.

Any improvement in the current climate of uncertainty over South Africa's economic growth prospects and the level of socio-political stability is likely to lead to a reversal of rand weakness.

This has happened before on several occasions over the past two decades and the spark required for a claw-back of the rand will probably be the next upswing in the commodity price cycle for metals & minerals, which seems to be imminent.