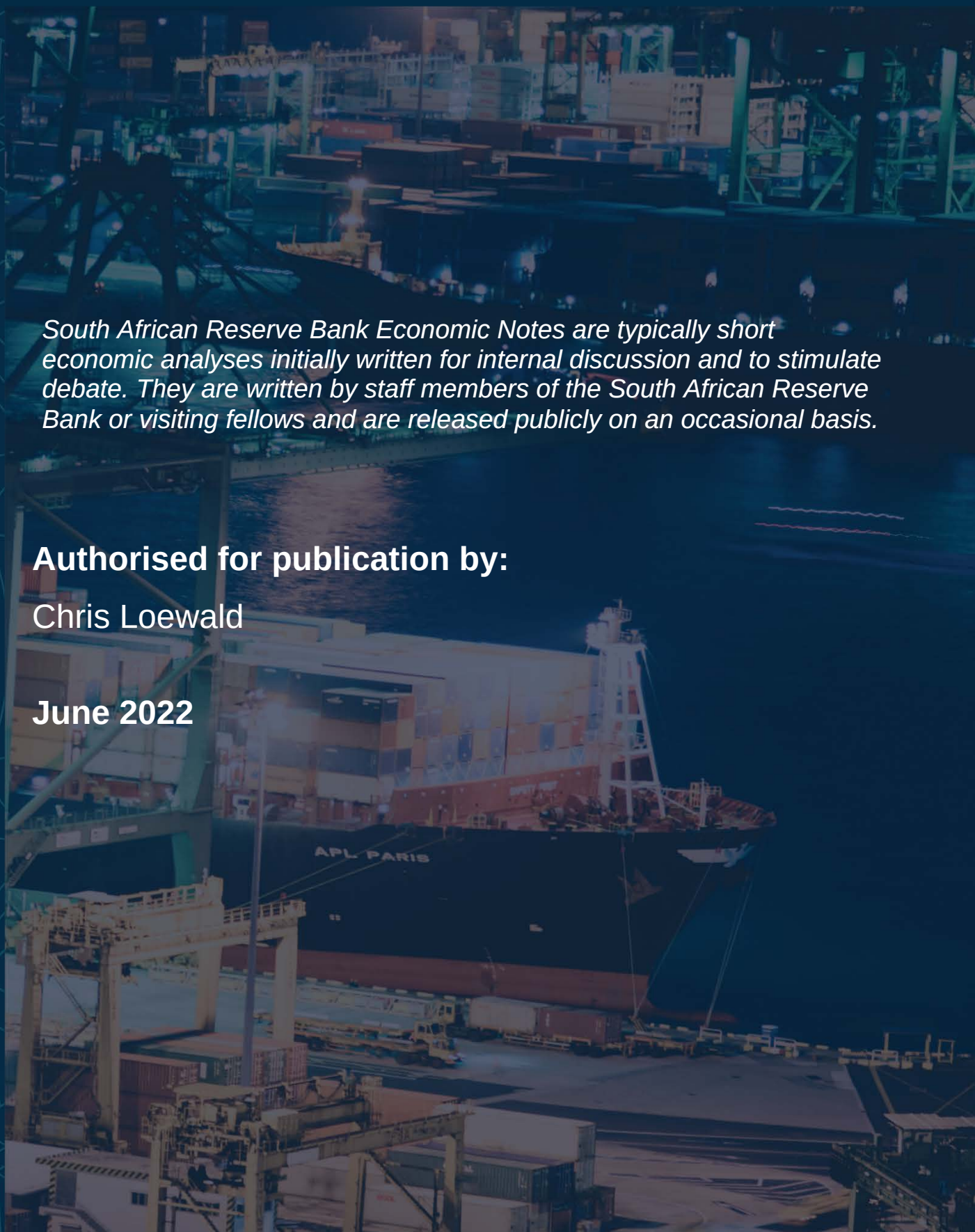
South African Reserve Bank
Occassional Bulletin of Economic Notes
OBEN/22/01

SOUTH AFRICAN RESERVE BANK



South African Reserve Bank Economic Notes are typically short economic analyses initially written for internal discussion and to stimulate debate. They are written by staff members of the South African Reserve Bank or visiting fellows and are released publicly on an occasional basis.

Authorised for publication by:

Chris Loewald

June 2022

SARB Occasional Bulletin of Economic Notes
June 2022

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OBEN 2201* – September 2021

Surging commodity prices explain a lot

Theo Janse van Rensburg and Erik Visser

Abstract

The surge in commodity prices is strongly correlated with upward surprises in global inflation outcomes and a major driver of emerging market exchange rate appreciation, including the rand. For South Africa, the improvement in the terms of trade have significantly improved the current account, boosted real incomes and welfare as well as the fiscus, and aided the recovery from the COVID-19 pandemic. Higher commodity prices have increased the cyclical fiscal revenue component to nearly 5% of GDP in 2020/21 – thereby almost fully offsetting the negative effects of the conventionally-measured increase in the output gap (caused by lower consumption and production). If the revenue boost from the terms of trade unwinds before other spending and growth have increased (and the output gap has closed), fiscal deficits will increase sharply. We estimate an income gap and use a 'command GDP' concept to show that demand may be less suppressed than suggested by the output gap. Nonetheless, given the size of the boost to income, factors such as higher taxes and more saving lean against higher spending. In these conditions, monetary policy may have limited impact.

1. Introduction[1]

Surging commodity prices have grabbed news headlines both locally and worldwide, raising inflationary pressures globally and providing significant gains to net commodity exporters like South Africa. Higher prices for commodity exports have massively supported export values, the exchange rate, a stronger than expected fiscal recovery and economic growth.

These effects have been large, in part because of the magnitude of the rise in prices. A weighted index of South Africa's export commodity prices (in US$) increased by 81.0% (35.6% in rand terms) between April 2020 and June 2021. The trade balance moved from a deficit of R36.1 billion to a surplus of R57.7 billion during the same period (a swing of more than R90 billion), with R115.0 billion higher exports and only R21.2 billion higher imports. It also boosted total tax revenue (gross), which improved by 56.2% (over four quarters) in the second quarter of 2021 (19.3% when measured over eight quarters to exclude the COVID-19 base effect). The rand appreciated by almost 30% over this period.

In this note, we describe the impact that commodity prices have had globally on inflation surprises and emerging market exchange rates, including the rand. We then focus on how the

[1] The authors are grateful to Chris Loewald, Zirk Jansen, Magda Steenkamp and seminar participants for valuable comments. We would also like to thank Rowan Walter and Patience Mathuloe for providing detailed commodity price data.

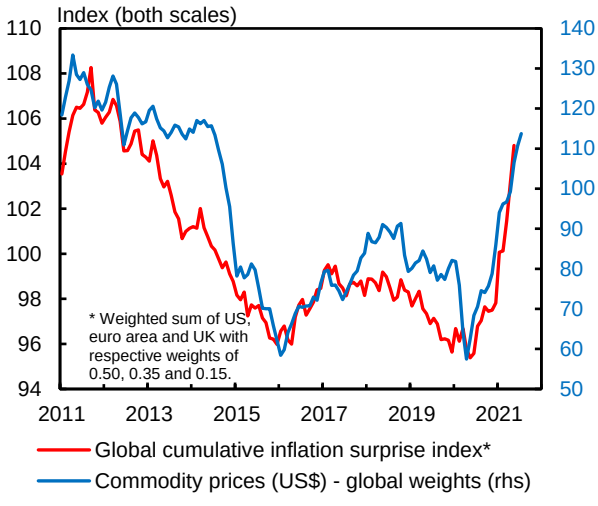
domestic terms of trade windfall has impacted on cyclical fiscal revenue and on domestic real income. Real income in the economy has grown by about 2½ percentage points faster than production measured by real gross domestic product (GDP) since the final quarter of 2019.

2. The impact of commodity prices on:

2.1 Inflation surprises

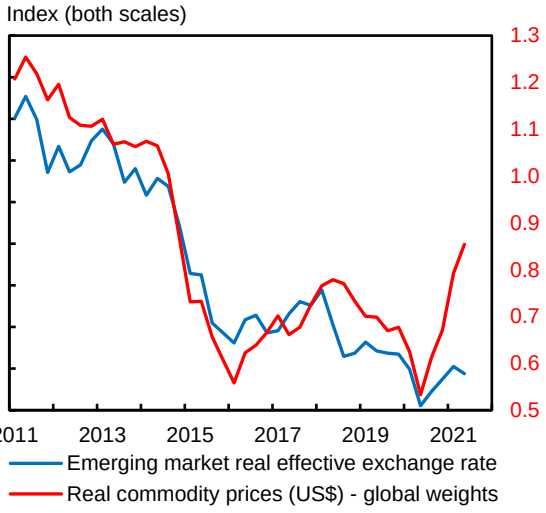
Global economic prospects have improved in major advanced economies, especially in the United States (US), supported by fiscal stimulus and the vaccine rollout. This stronger-than-expected economic growth, particularly since the fourth quarter of 2020, has led to a further surge in international commodity prices. The International Monetary Fund's (IMF) primary commodity price index rose by 97.9% over the last 15 months, while the global inflation surprise index is highly correlated with international commodity prices[2] (Figure 1). With base effects and supply chain challenges, higher commodity prices have increased global inflation (Fitch, 2021). Timber prices alone have increased by 16.5% since July 2020, exerting upward costs on house building costs and ultimately raising consumer prices. US headline inflation has continued to surprise and accelerated to 5.4% in June and July 2021, the highest level in almost 13 years.

Figure 1: International commodity prices and inflation surprises



Sources: Cates (2021), Haver and IMF

Figure 2: International commodity prices and emerging market exchange rates



Sources: Haver, IMF and SARB

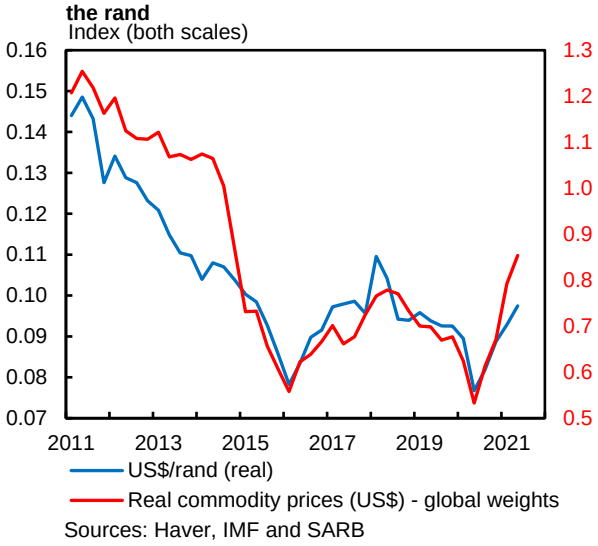
[2] The IMF's primary commodity price index (IMF, 2019: 2–3) is a weighted average of selected benchmark commodity prices (in US dollars) which are representative of the global market. It includes energy (40.9%), agriculture (34.5%), fertiliser (1.9%) and metal prices (22.7%).

2.2 Emerging market exchange rates

There is also a strong correlation (0.96) between international commodity prices and a basket of emerging market real (inflation adjusted) exchange rates[3] (Figure 2) over the 2011–2020 period. This implies that the bulk of the improvement in emerging market real exchange rates can be explained by higher commodity prices over the period. The correlation with the real rand exchange rate is 0.93.

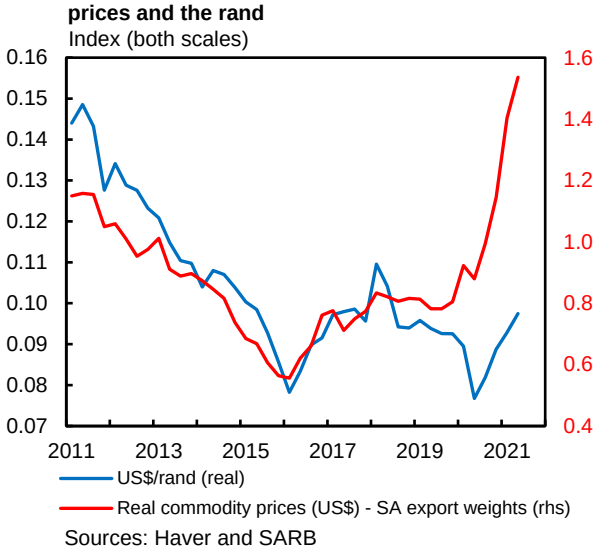
When we replace the generic international commodity prices measure with an index which captures South Africa's main export commodity prices,[4] the correlation coefficient falls to 0.72 over the same period (Figure 4). This appears as an anomaly, but probably reflects risk factors that have worked against the appreciation that the surge in export-weighted commodity prices should have generated. This is probably best illustrated in Figure 5, where the rand has historically outperformed other emerging market currencies when the South African export-weighted commodity prices outperformed international commodity prices. Despite an exceptional outperformance of the South African export-weighted commodity prices post 2020, the rand has failed to outperform its emerging market peers.

Figure 3: International commodity prices and the rand



Sources: Haver, IMF and SARB

Figure 4: South Africa's export commodity prices and the rand

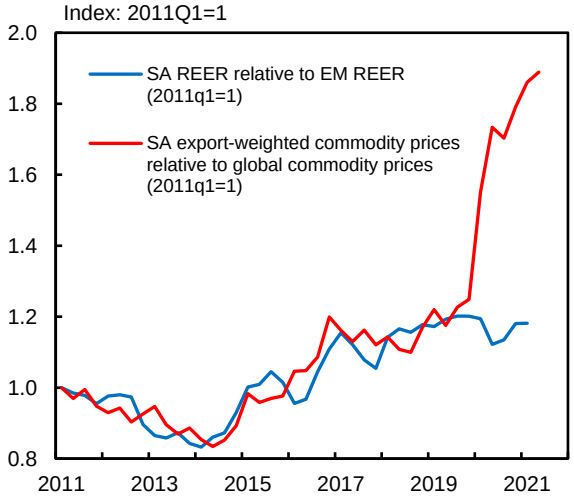


Sources: Haver and SARB

[3] It is an equally weighted index of the dollar exchange rates against the currencies of Brazil, Chile, Hungary, India, Malaysia, Mexico, Philippines, Russia and Turkey.

[4] The SARB index of commodity prices (Mano and Walter, 2018) is export value weighted using 24-months moving averages and includes 23 of South Africa's major export commodities (mostly industrial metals and energy) and their relevant prices. It was dominated in 2020 by six commodities: iron ore (13.0%), gold (11.2%), thermal coal (11.1%), petroleum products (8.3%), platinum (7.8%) and manganese ore (6.7%).

Figure 5: Exchange rates and commodity prices

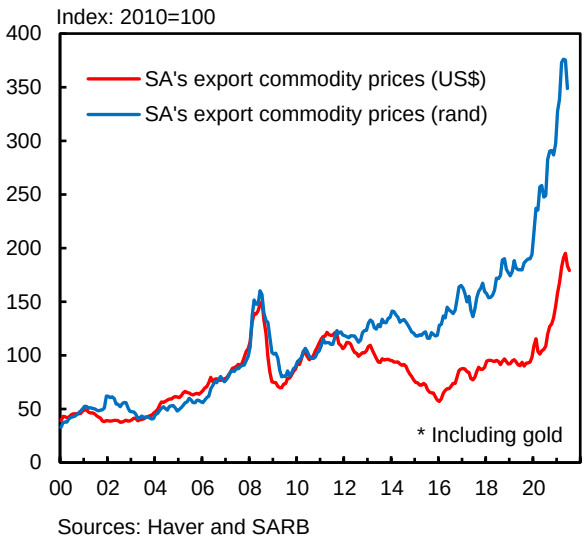


Sources: Haver and SARB

2.3 Terms of trade and current account

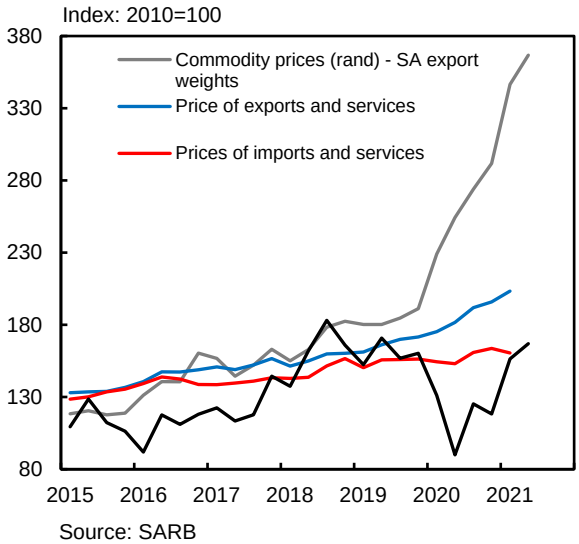
The South African export-weighted commodity price index (in US$) increased by 81.0% between April 2020 and June 2021 (Figure 6). The exchange rate of the rand, however, appreciated by 33.5% during this period, reducing the rise in commodity prices in rand terms to about 36%. The increase in export commodity prices has raised the total export prices of goods (including gold) and services (Figure 7). By contrast, the import prices of goods and services have remained relatively subdued during the same period, in part due to the collapse in oil prices from weaker global demand, travel bans, declining US dollar prices for certain imports, and the stronger exchange rate of the rand.

Figure 6: South Africa's export commodity prices*



Sources: Haver and SARB

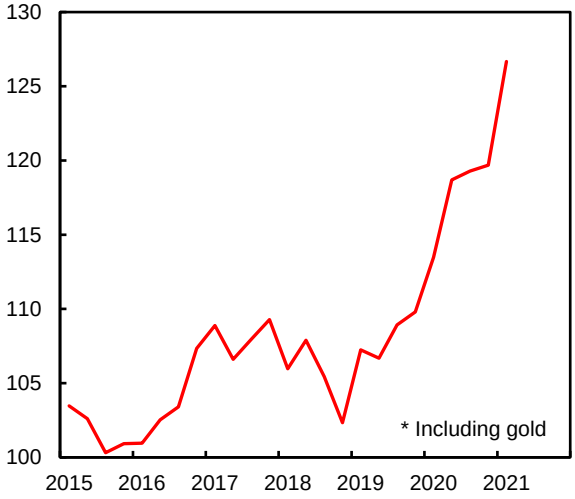
Figure 7: Import and export prices



Source: SARB

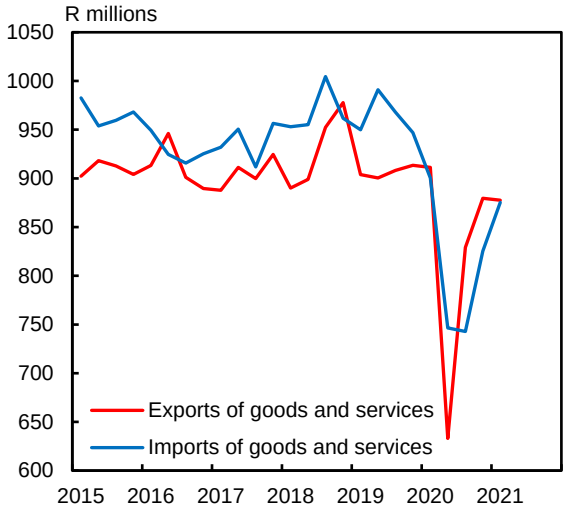
The rising export prices and lower import prices (both in rand terms) have resulted in a further improvement in South Africa's terms of trade – registering the seventh consecutive quarterly increase during the first quarter of 2021 (Figure 8), which brings the total improvement since the fourth quarter of 2018 to 23.8%.

Figure 8: Terms of trade*



Source: SARB

Figure 9: Export and import volumes



Sources: Stats SA and SARB

The value of exports of goods and services surged in the third quarter of 2020, reflecting higher volumes (Figure 9) due to the recovery in global demand, but also the sharp increase in commodity prices. Mining exports was particularly buoyant, rising by 56.9% (in current prices) between the second quarter of 2020 and the first quarter of 2021. The platinum group metals (PGMs) especially stood out, with the rhodium price having risen by 183.4% and PGM exports rising by 86.9% (in current prices) during the same period.

2.4 Fiscus

Fluctuations in the business cycle and external factors such as commodity prices can have a significant impact on the fiscal position. When economic activity is buoyant or commodity prices are high, tax receipts will be cyclically strong. Here we estimate the cyclical tax component.

The structural budget balance (or cyclically adjusted budget balance) is defined as the budget balance that would be observed if the cyclical component of revenue or expenditure were excluded. Thus, it is the budget balance that is consistent with trend or potential GDP growth in the economy and a normal composition of GDP.

However, that definition does not explicitly take account of commodity prices in cyclical tax revenues. According to Turner (2006), 'such developments are likely to lead to higher tax revenues, most immediately from the companies directly involved in extracting or producing the commodities, but also less directly as the consequent rise in the terms of trade increases real incomes more broadly'. To address this, Turner suggests a measure of the *real income gap*, or the output gap adjusted for terms of trade effects.

The income gap is defined as follows:

Equation 1: Income gap = (ycuMMU + xsh * (ptt - @mean(ptt,"2011 2019")) * 100)

Where:

- ycuMMU = Output gap (as estimated by the QPM)
- xsh = share of exports in GDP in the base year
- ptt = terms of trade
- @mean(ptt,"2011 2019") = mean terms of trade over the period 2011–2019 (our proxy for the equilibrium terms of trade)

If we define the equilibrium terms of trade as the mean of 103.9 over the 2011–2019 period[5] (Figure 10), we estimate that the higher terms of trade recently have boosted the budget balance by nearly 5%[6] of GDP in the 2020/21 fiscal year (Figure 11) – calculated as:

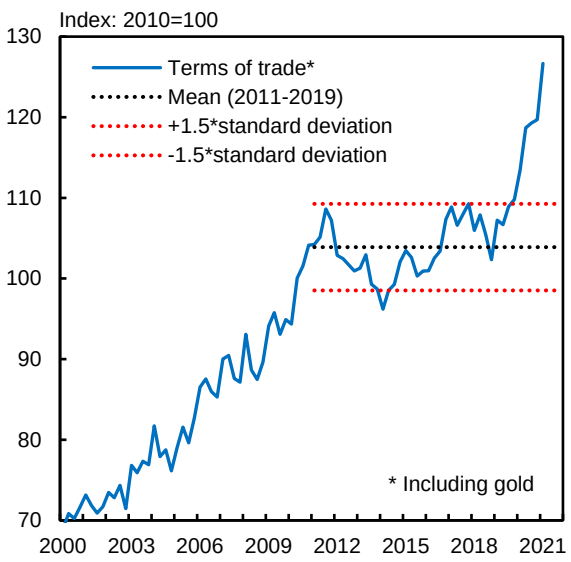
"+*xsh * (ptt - @mean(ptt,"2011 2019")) * 100*" (from equation 1)

More precisely, whereas the South African Reserve Bank (SARB) estimates that the output gap was -5½% during the said fiscal year, we estimate that the income gap was only around -½ %, as the strong positive cyclical impact of the terms of trade almost neutralises the negative output gap. Put differently, in the 2020/21 fiscal year, the actual fiscal balance was almost equal to the structural fiscal balance because the revenue shortfall created by the output gap is almost fully offset by the cyclical windfall emanating from the buoyant terms of trade.

[5] Our equilibrium terms of trade assumption fits the data well over the period – remaining within a 'channel' of 1.5 standard deviations – only recently breaking out of this 'channel'. It is premised on a rising equilibrium terms of trade during the 2000's due to Chinese growth taking off, and then stabilising in the 2010's as Chinese growth stabilises and starts slowing. If a new super cycle in commodities is emerging then the equilibrium terms of trade assumption will be underestimated.

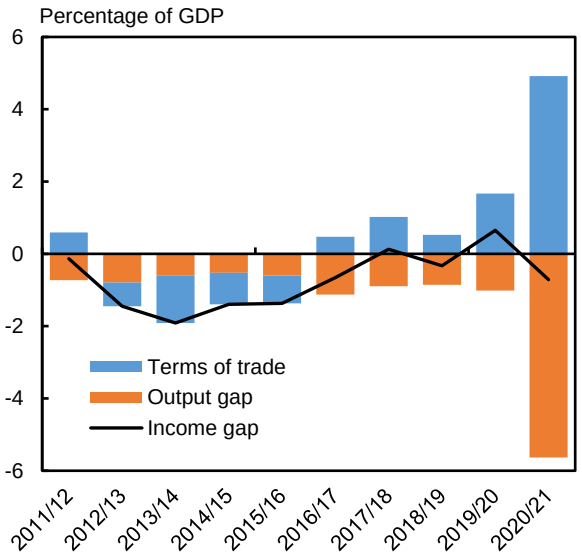
[6] Note that this reflects the accumulated impact over several years from the equilibrium terms of trade. It therefor includes among others, the impact of last year's lockdown as well as leads and lags in how commodity prices feed through into tax revenues.

Figure 10: Equilibrium terms of trade



Sources: Haver and SARB

Figure 11: Cyclical revenue contributions



Sources: Haver and SARB

2.5 Real income

Real GDP can be a misleading indicator of a country's welfare during periods of rapid change in the country's terms of trade as compositional shifts in output occur. Kohli (2004) suggests distinguishing between real GDP and real domestic income. Real GDP focuses on production possibilities, whereas real income stresses return to production and therefore consumption (or more generally absorption) possibilities and welfare.

Kohli shows that real GDP growth is systematically underestimated when the terms of trade improve. This is due to the differences in the corresponding price indices. In Kohli's approach, the implicit GDP price deflator (nominal GDP divided by real GDP) will show higher inflation than the income price deflator alone when the terms of trade improve (also see the graph for South Africa, where PY and Y are the conventional GDP deflator and nominal GDP respectively).

To put it in simpler terms, during a surge in export prices, a country can either import more in volume terms for what it exports, or export smaller quantities for what it imports. An improvement in the terms of trade unambiguously increases real income and welfare. However, these beneficial effects in the terms of trade are not captured well by real GDP as it measures production. In fact, if real GDP is measured by a Laspeyres quantity index, an improvement in the terms of trade will actually lead to a fall in real GDP.

Consequently, Kohli develops a concept called 'Command GDP' to adequately capture the terms of trade effects, which is defined as follows:

Equation 2: Command GDP = {YGDE1 + E1 * (PE/PM) – M1}

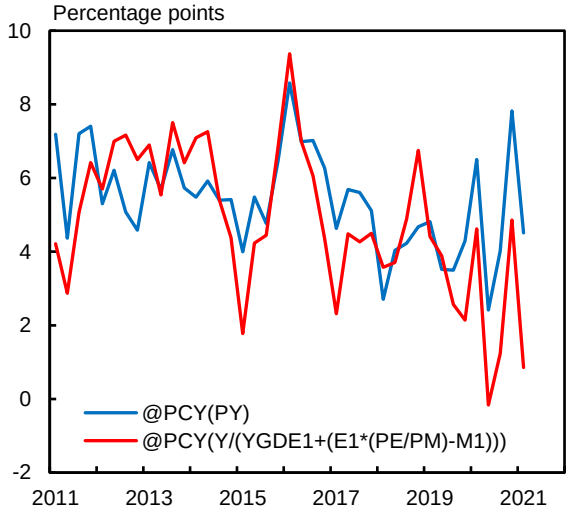
Where:

- YGDE1 = real domestic demand

- E1 = export volumes
- M1 = import volumes
- PE = import price deflator
- PM = import price deflator

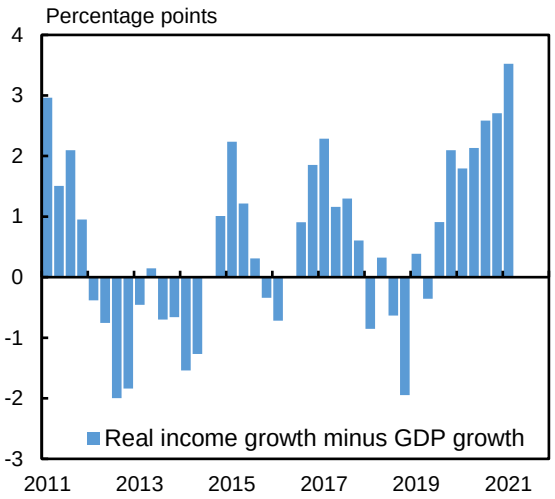
Using this methodology, we calculate that command GDP growth has been about 2½ percentage points stronger than conventional GDP growth since the final quarter of 2019 (Figures 12 and 13).

Figure 12: Conventional and command GDP



Sources: Haver and SARB

Figure 13: Difference between conventional and command GDP growth



Sources: Haver and SARB

3. Concluding remarks

The surge in commodity prices is strongly correlated with upward surprises in global inflation outcomes and a major driver of emerging market exchange rate appreciation, including the rand. For South Africa, it has significantly improved the current account, boosted real incomes and welfare as well as the fiscus, and aided the recovery from the COVID-19 pandemic.

Higher commodity prices have increased cyclical fiscal revenue component to nearly 5% of GDP in 2020/21 – thereby almost neutralizing the negative effects of the conventionally-measured increase in the output gap. If the revenue boost from the terms of trade unwinds before other private sector spending and growth have increased (and the output gap has closed), fiscal deficits will increase sharply.

We estimate an income gap and use a ‘command GDP’ concept to show that demand may be less suppressed than suggested by the output gap. But higher real incomes are not fully translating into increased demand as factors such as higher taxes and more saving lean against higher spending. In these conditions, monetary policy may have limited success in boosting demand.

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