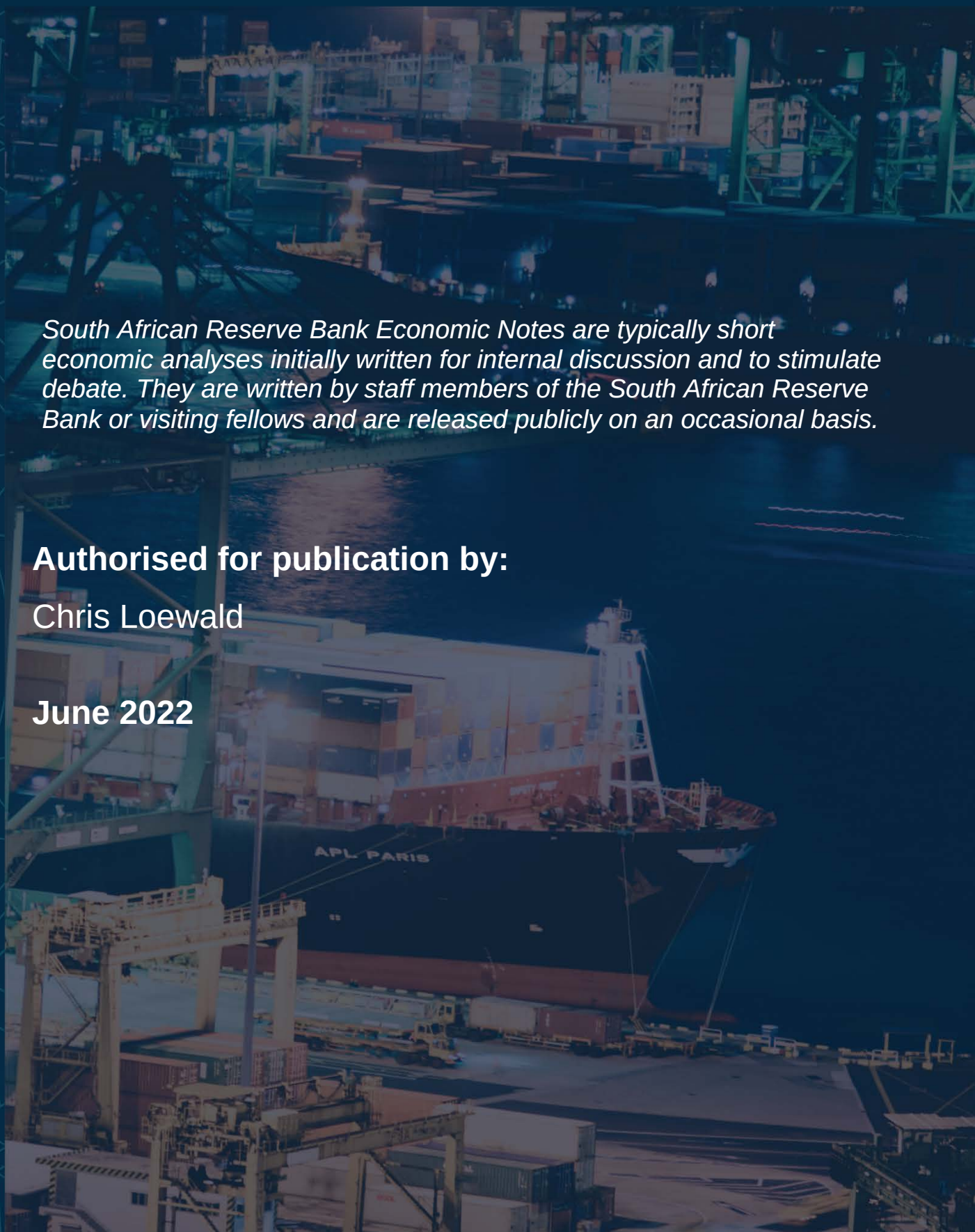
South African Reserve Bank
Occassional Bulletin of Economic Notes
OBEN/22/01

SOUTH AFRICAN RESERVE BANK



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Authorised for publication by:

Chris Loewald

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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.

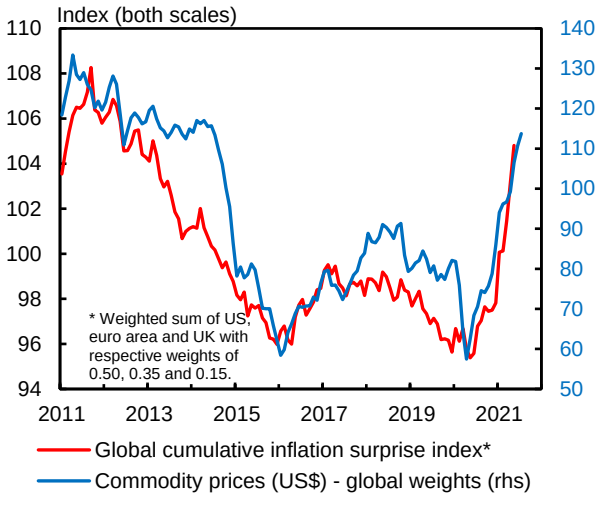
domestic terms of trade windfall has impacted on cyclical fiscal revenue and on domestic real income. Real income in the economy has grown by about 2½ percentage points faster than production measured by real gross domestic product (GDP) since the final quarter of 2019.

2. The impact of commodity prices on:

2.1 Inflation surprises

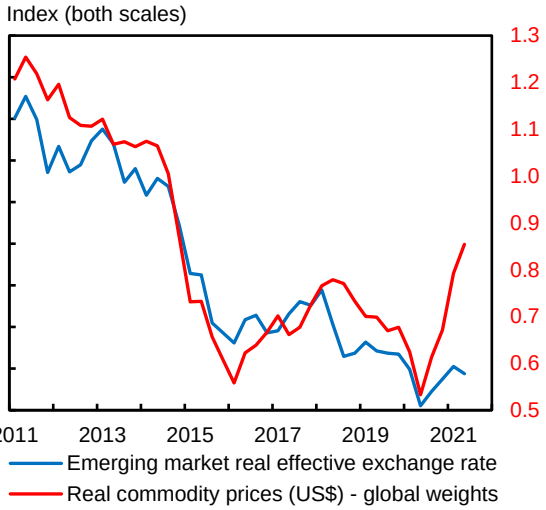
Global economic prospects have improved in major advanced economies, especially in the United States (US), supported by fiscal stimulus and the vaccine rollout. This stronger-than-expected economic growth, particularly since the fourth quarter of 2020, has led to a further surge in international commodity 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

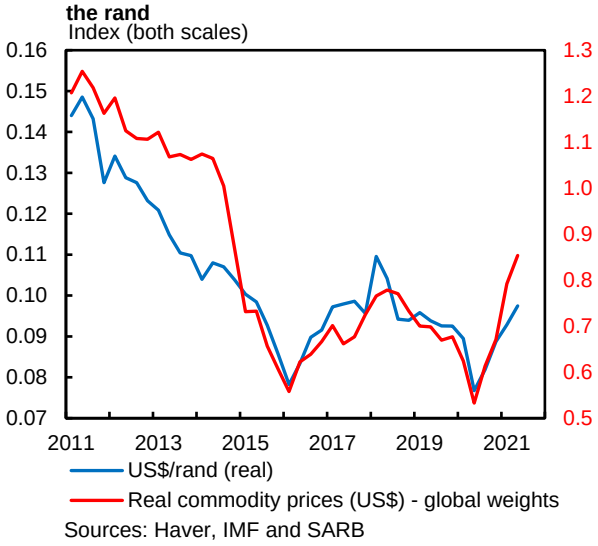
[2] The IMF's primary commodity price index (IMF, 2019: 2–3) is a weighted average of selected benchmark commodity prices (in US dollars) which are representative of the global market. It includes energy (40.9%), agriculture (34.5%), fertiliser (1.9%) and metal prices (22.7%).

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.

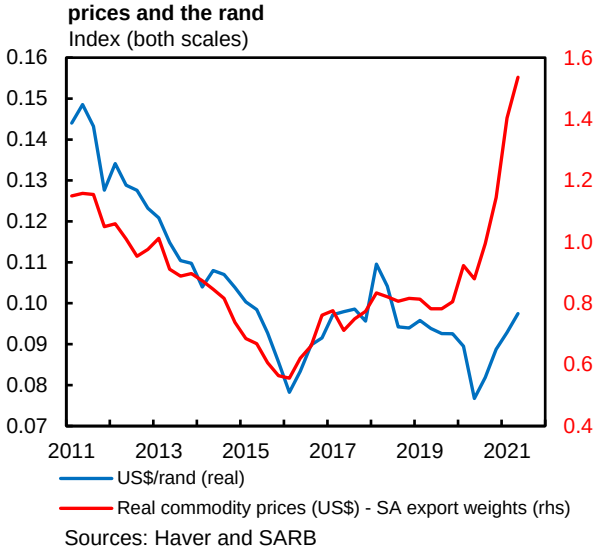
When we replace the generic international commodity prices measure with an index which captures South Africa's main export commodity prices,[4] the correlation coefficient falls to 0.72 over the same period (Figure 4). This appears as an anomaly, but probably reflects risk factors that have worked against 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

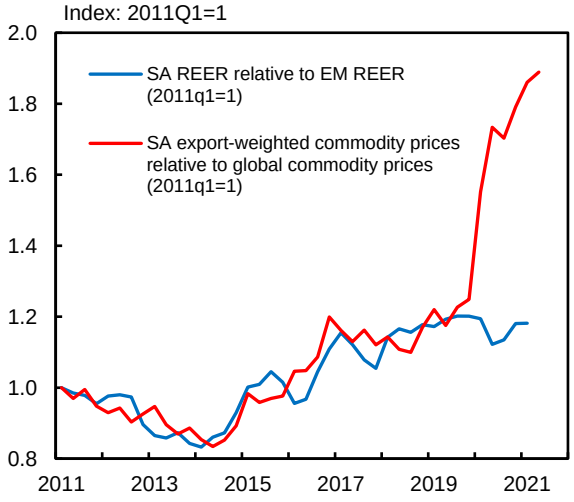


Sources: Haver and SARB

[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

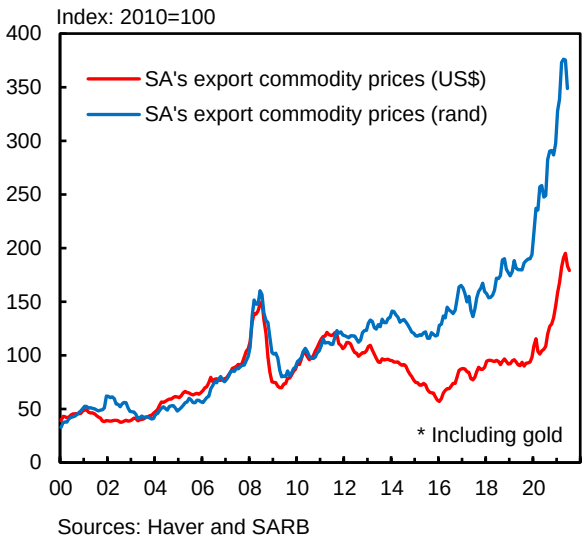


Sources: Haver and SARB

2.3 Terms of trade and current account

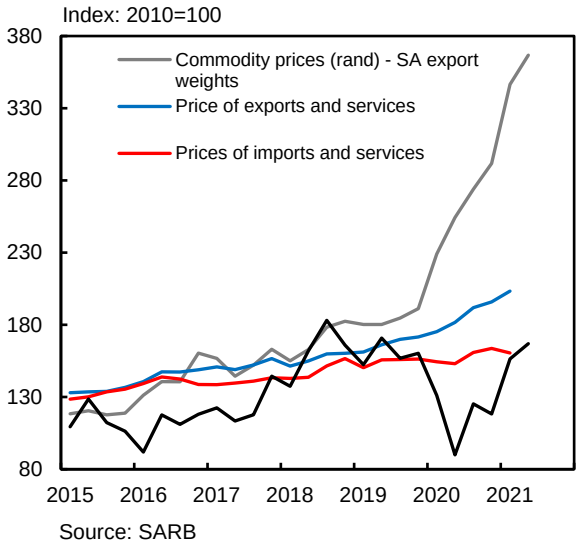
The South African export-weighted commodity price index (in US$) increased by 81.0% between April 2020 and June 2021 (Figure 6). The exchange rate of the rand, however, appreciated by 33.5% during this period, reducing the rise in commodity prices in rand terms to about 36%. The increase in export commodity 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

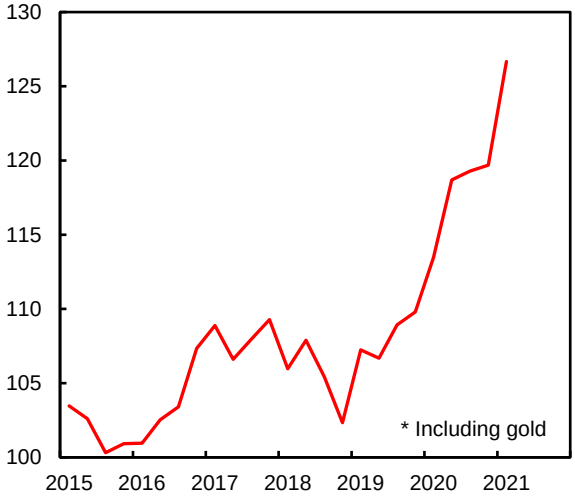
Figure 7: Import and export prices



Source: SARB

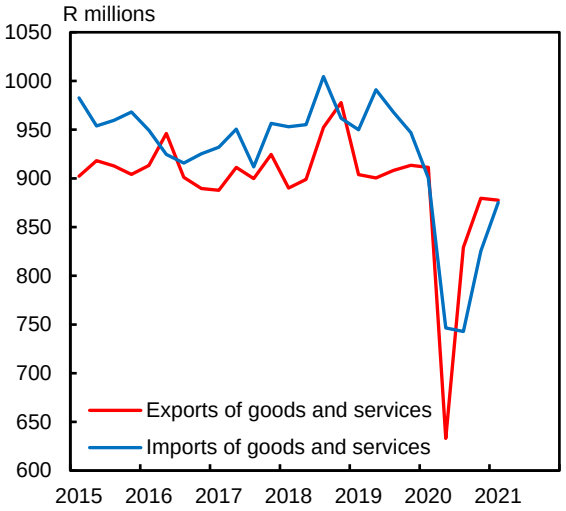
The rising export prices and lower import prices (both in rand terms) have resulted in a further improvement in South Africa's terms of trade – registering the seventh consecutive quarterly increase during the first quarter of 2021 (Figure 8), which brings the total improvement since the fourth quarter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

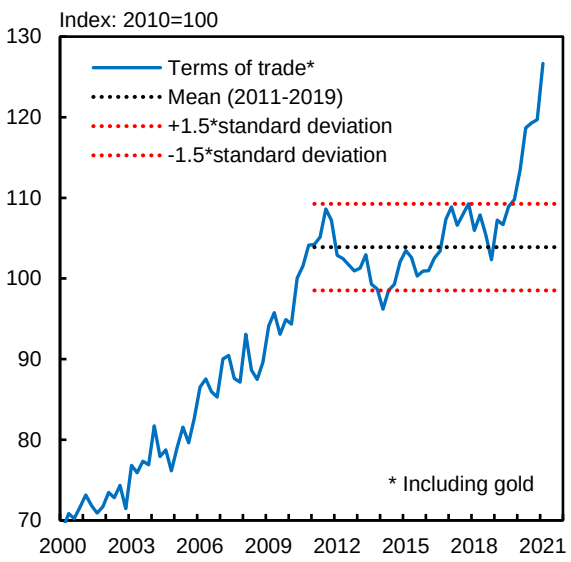
"+*xsh * (ptt - @mean(ptt,"2011 2019")) * 100*" (from equation 1)

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.

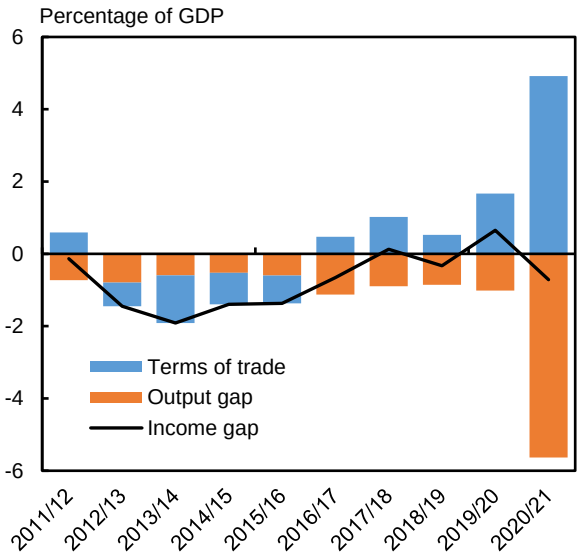
[6] Note that this reflects the accumulated impact over several years from the equilibrium terms of trade. It therefor includes among others, the impact of last year's lockdown as well as leads and lags in how commodity prices feed through into tax revenues.

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}

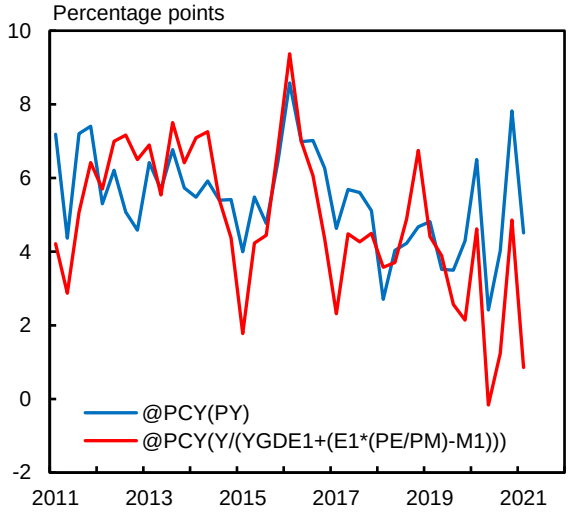
Where:

- YGDE1 = real domestic demand

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

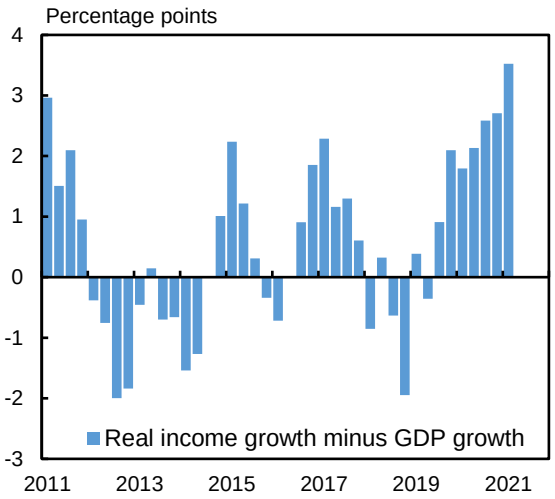
Using this methodology, we calculate that command GDP growth has been about 2½ percentage points stronger than conventional GDP growth since the final quarter of 2019 (Figures 12 and 13).

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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OBEN 2201* – April 2022

Should we worry about the high producer prices? Yes, but

Susan Knox, Palesa Mnguni, Pieter Pienaar and Witness Simbanegavi

Abstract

Over the past two years, both global and domestic producer prices have risen markedly. This has raised concerns that the high producer inflation may eventually be passed onto consumer prices. This note compares producer and consumer price indices and the implications for pass-through of PPI to CPI inflation. We find strong co-movement between final PPI and goods CPI, but somewhat weaker co-movement with headline CPI. This suggests that some pass-through should be expected, particularly for the closely related baskets such as final PPI and goods CPI. However, the material differences between the indices, together with competition considerations, will serve to moderate pass through.

1. Introduction

Price stability is a core pillar for a sound macroeconomic framework and an enabler of economic growth. Central banks, particularly the inflation targeting ones like the South African Reserve Bank (SARB), routinely monitor price developments in the economy to inform monetary policy. Two prominent indicators of price inflation are the consumer price index (CPI) and the producer price index (PPI). Consumer price inflation captures the changes in the cost of living faced by final consumers while producer price inflation captures the "change in the prices of goods either as they leave their place of production or as they enter the production process" (OECD, 2006).[1] These prices have risen sharply globally as economies recover from the COVID-19 induced recession of 2020. For instance, the OECD's combined PPI inflation rose to 15.5% in December 2021, reaching a multi-decade high (Figure 1).

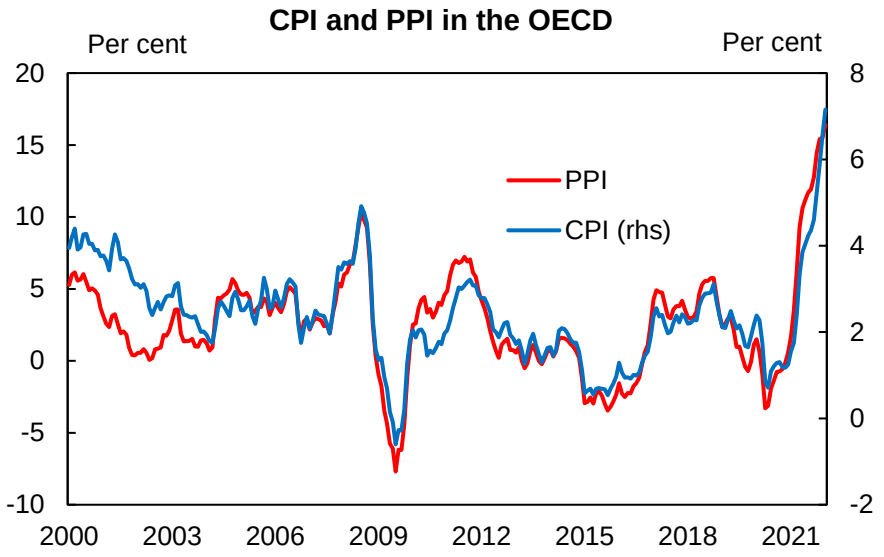
Consumer price inflation has also risen sharply with the January 2022 inflation recording 7.5% in the US, 5.5% in the UK and 5.1% in the eurozone. For selected emerging markets the average PPI rose to 12.9% in November 2021, surpassing the high reached in 2008 during the global financial crisis (GFC) (Figure 2). In South Africa intermediate PPI inflation soared to 23.1% in December 2021, before moderating to 21% in January 2022. Final PPI inflation rose to 10.8% in December, its highest level in over a decade, before slowing marginally to 10.1% in January 2022.[2] CPI inflation has risen sharply since the second half of 2021,

1 Methodological Guide for Developing Producer Price Indices for Services 2006. OECD

2 Intermediate PPI inflation measures the rate of change in input prices at the intermediate production stage. This is distinct from the final PPI inflation which captures the change in the prices of products sold as output by producers.

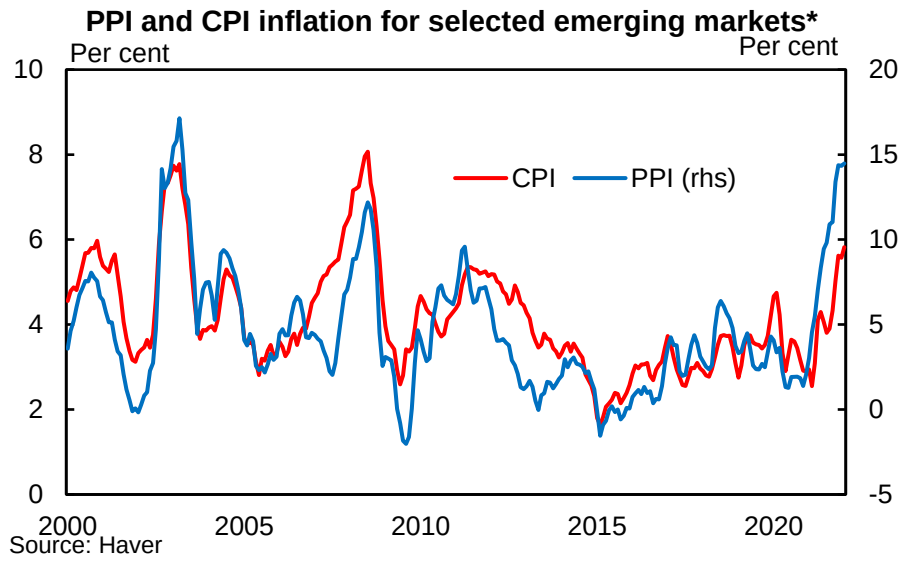
reaching 5.9% in December 2021, the highest level since March 2017, before moderating slightly to 5.7% in January 2022.

Figure 1



Source:OECD

Figure 2[3]



Source: Haver

*EMs: South Africa, China, Hungary, Poland, Thailand, Uruguay

The marked acceleration in PPI inflation is to some extent a result of the low base created in 2020 but there are also fundamental drivers. Various inputs, particularly commodities, have experienced sharp price increases since the onset of the pandemic, reflecting large shifts in demand for goods, and supply chain bottlenecks.[4] For instance, there have been mismatches in demand and supply because of the staggered re-opening of economies and supply chains'

[3] The selection of emerging market countries is based on the availability of long time series data for both CPI and PPI indicators for comparator countries.

[4] In the most recent period, oil and grains prices rose sharply, further adding to producer inflation pressures.

inability to recover quickly enough to meet the surge in demand. The shift in consumer demand towards goods, supported by the generous fiscal stimulus measures in advanced economies has piled additional pressure on supply chains and boosted demand for commodities and other inputs.

This note analyses the relationship between PPI and CPI inflation in South Africa to shed light on the extent to which the elevated producer prices could serve as an indicator for the future trajectory of CPI. This should enable policymakers to better anticipate possible future changes in CPI inflation and thus fine-tune policy.

2. The nexus between producer and consumer price inflation

2.1 PPI vs CPI

Figures 1 and 2 above show a strong co-movement between PPI and CPI inflation. This co-movement raises the prospect of either both indices being driven by the same underlying factors or a causal relationship between them. The question is whether the elevated PPI inflation is a precursor to higher future CPI inflation. Intuitively, rising input prices push production costs up along the entire production chain and should, eventually, pass through to consumer prices.[5] For this reason, PPI inflation is often referred to as "pipeline inflation" with the implication that it should eventually be reflected in consumer prices.[6] Indeed, the literature does find some support for the thesis that PPI inflation is a primary contributing factor to CPI inflation.[7] South African studies have generally found a statistically significant causal relationship running from PPI to CPI.[8]

However, there are fundamental differences between these two inflation measures (section 2.3). Aside from energy prices such as oil, PPI typically measures only domestic prices, including exports. Although PPI does not explicitly measure imports, goods may contain imported components that form part of the production costs. These costs, however, cannot be disentangled in the final PPI. On the other hand, the CPI measures the prices of both domestic and imported consumer goods. In addition, government taxes and subsidies affect consumer prices but not producer prices. Furthermore, most PPI measures exclude services – a large share of the CPI.[9] Not surprisingly, PPI and CPI can have divergent trends.

5 T E Clark, 1995. 'Do producer prices lead consumer prices?', Economic Review, Federal Reserve Bank of Kansas City 80(Q III), 1995, pp 25–39.

6 Moreno, R. 2010. Some issues in measuring and tracking prices in emerging market economies. BIS Paper No. 49.

7 José Sidaoui, Carlos Capistrán, Daniel Chiquiar and Manuel Ramos-Francia (2009). "On the predictive content of the PPI on CPI inflation: the case of Mexico". BIS Papers No 49. See also Jonathan Weinhagen (2002). "An empirical analysis of price transmission by stage of processing". Monthly Labour Review.

8 See for instance Zerihun Gudeta Alemu (2011). "Causality links between consumer and producer price inflation in South Africa". Applied Economics Letters.

9 In South Africa services constitute about 51% of the CPI basket.

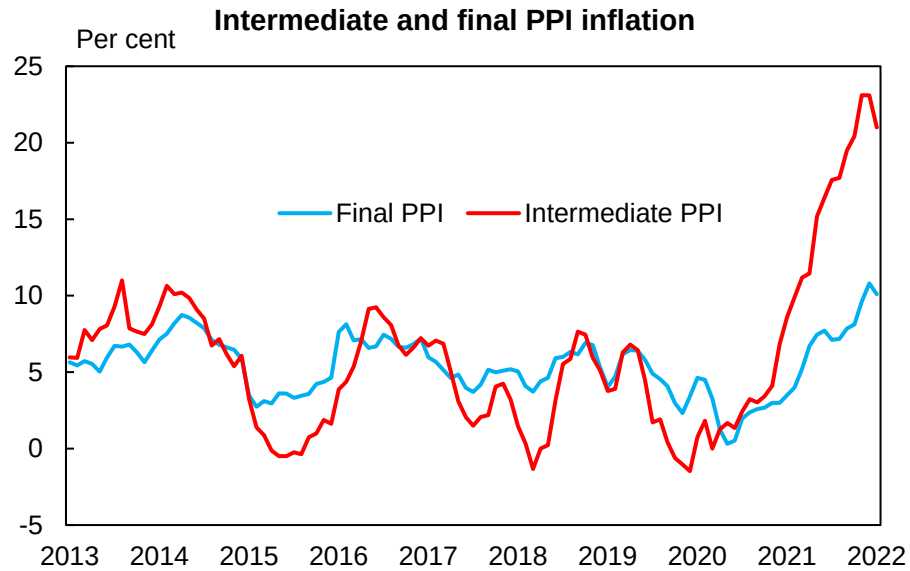
Consequently, pass-through of PPI to CPI inflation is typically much weaker than implied by the production chain view.[10,11]

2.2 Intermediate and final (headline) PPI

Unlike the CPI inflation which is monolithic (only measured at the point of final consumption), PPI inflation can be measured at the intermediate production stage (intermediate PPI) or at the final goods production stage (final PPI). The final PPI basket is larger and consists of 181 products compared to the intermediate PPI basket which has only 35 commodities.

Figure 3 shows that the intermediate PPI inflation is generally more volatile (presents larger swings) compared to the final PPI inflation, and occasionally enters deflation territory. Since October of 2020, intermediate PPI inflation has accelerated sharply, reaching a high of 23.1% in both November and December of 2021, before moderating slightly to 21% in January 2022. The final PPI has also accelerated over the same period, but not as markedly, causing a widening gap between these two series.

Figure 3



Source: Stats SA

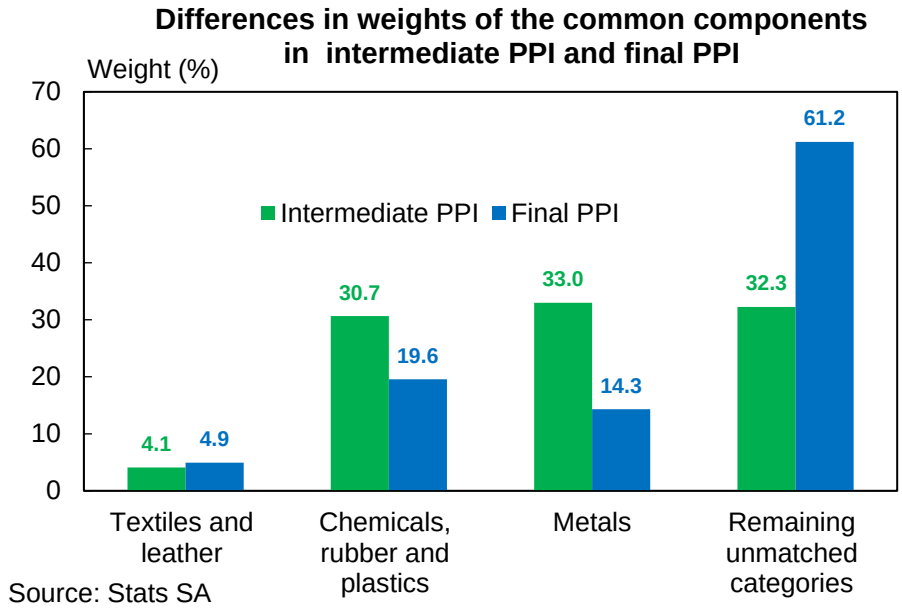
The higher volatility of, and sharper acceleration in, intermediate PPI inflation can in part be explained by the sharp price movements in large weight constituent items, mostly related to commodities. Similarly, the divergence between the intermediate and the final PPI can also be explained by the differences in the weights of the main components as well as the composition of the baskets. Figure 4 crudely matches the common broad categories between the two baskets. The intermediate PPI is comprised of six main sub-components of which

10 Ü Volkan and E Ugur, '*The relationship between consumer price and producer price indices in Turkey',* International Journal of Academic Research in Economics and Management Sciences, 3(1), 2013, pp 205–222.

11 Blomberg and Harris (1995) and Clark (1995) conclude that the producer price index does not have significant predictive power on future consumer price index.

"chemicals, rubber and plastic products" and "basic and fabricated metals" account for around 64% of the basket. The weight of these components in the final PPI is much less, at about 34% of the basket. These differences imply that a given increase in a common component (e.g., metals) will have vastly different impacts on the two price indices.[12] Also, the large unmatched category means there are drivers of final PPI inflation that are potentially unrelated to, or of much less significance in, intermediate PPI inflation, thus rationalising the divergence between these two series.

Figure 4



Source: Stats SA

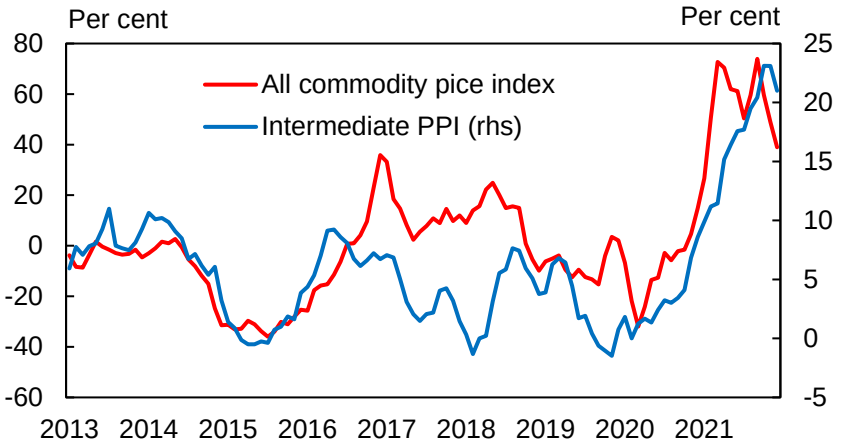
The intermediate PPI closely correlates with global commodity prices (Figure 5)[13]. A similar picture emerges when one considers the main components of the intermediate PPI and the global industrial materials index (Figure 8). Commodity prices rose sharply since mid-2020 in response to the supply and demand dynamics created by the pandemic-induced lockdowns as well as fiscal support in the major advanced countries. On the supply side, logistics constraints and the resultant decline in inventories exacerbated input shortages, driving commodity prices higher. On the demand side, the sharp and skewed recovery in the demand for goods alongside a depreciated dollar also fuelled commodity markets. South Africa, as a commodity exporter, has benefitted from the robust commodity prices and terms of trade. However, the markedly higher global commodity prices have also been associated with sharply rising production costs in the domestic economy (Figure 6).

12 The "basic and fabricated metals and chemicals components" have been largely responsible for the sharp rise in intermediate PPI inflation but their weights in final PPI (which are shown by the blue bars in Figure 6) are not as large, meaning that the contribution to final PPI inflation is more muted.

13 All IMF commodity indices are dollar-based.

Figure 5

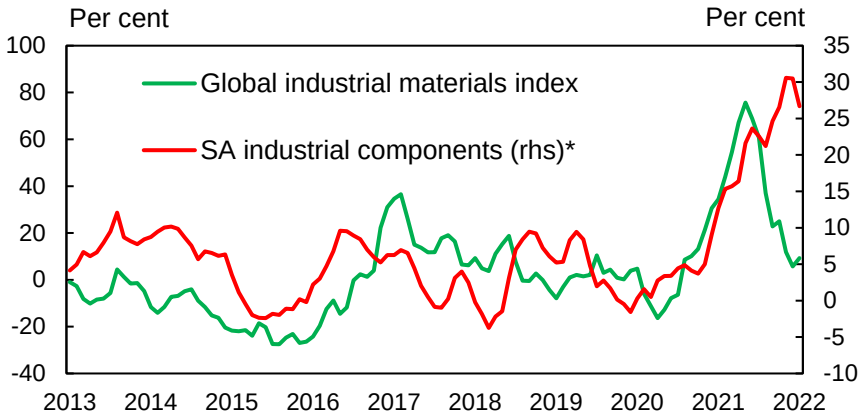
Global commodity prices and SA intermediate PPI



Sources: IMF and Stats SA

Figure 6

Global commodity prices and SA industial components of intermediate producer prices



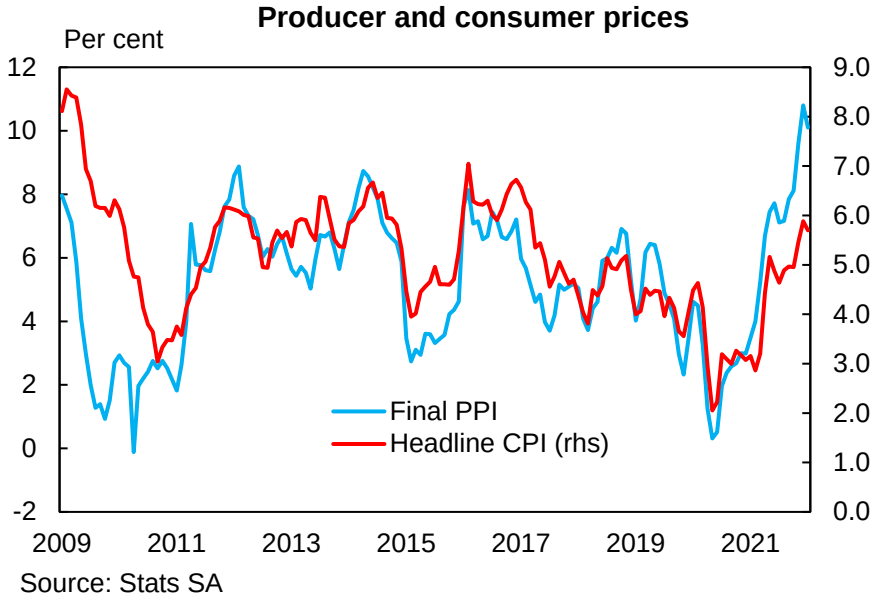
Sources: IMF and Stats SA
* combined index of basic chemicals and basic metals of SA IPPI

2.3 PPI and CPI

How well does final PPI co-move with headline CPI in South Africa? As discussed earlier, a stronger co-movement suggests that either the two series are driven by similar fundamentals or that one drives the other or both. Below we restrict ourselves to a qualitative analysis, leaving the assessment of causality to future work. Figure 7shows that headline CPI and PPI are generally positively correlated, with stronger co-movement in some periods (e.g., between

2015 and 2018) than others (e.g., 2012-2014).[14] The fact that final PPI and headline CPI do not consistently strongly co-move is not particularly surprising. Differences in the baskets and the weights of the various components of the baskets imply differentiated impacts from movements in the prices of any one component. Fundamentally, the construction of the indices is dissimilar.[15] CPI includes a services component which makes up 51.3% of that basket while PPI does not have a services component.

Figure 7

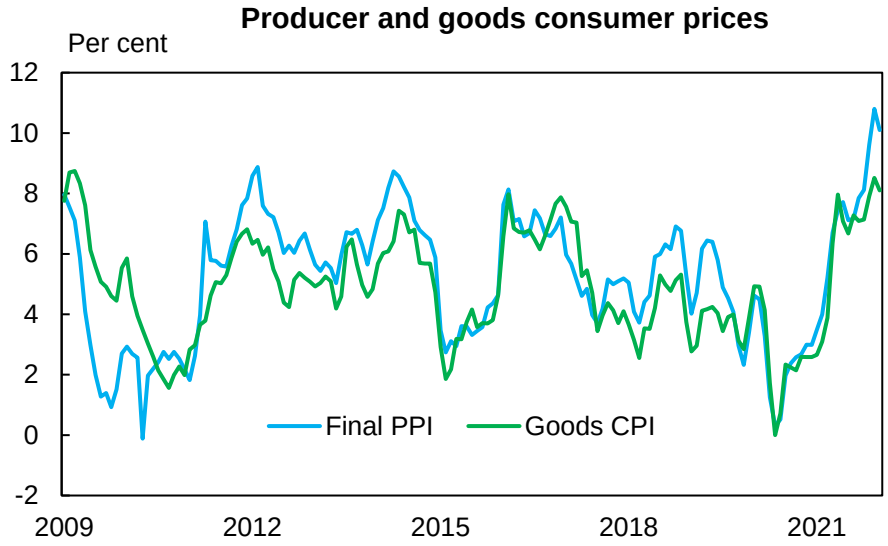


Given that PPI excludes services, it may be more instructive to compare final PPI to goods CPI rather than headline CPI. Differences, however, remain with respect to taxes and subsidies and the inclusion of imports in goods CPI as well as the inclusion of exports in PPI. Figure 8 shows that there is a stronger co-movement between these two series compared to headline CPI. Also, the correlation appears to have strengthened since 2020. Given the standard finding in the literature that PPI has predictive power over future CPI, we should expect the current strong increases in final PPI inflation to be followed by higher goods CPI inflation, but with incomplete pass through.

[14] This contrasts sharply with Figure 1 for OECD indices.

[15] RMB Markets Research. 10 May 2021. "Explaining the divergence between PPI and CPI". SA Macro Data Review and Preview.

Figure 8



Source: Stats SA

Differences in the weights of the coinciding constituent components partly explain the imperfect correlation between final PPI and goods CPI (Figure 9). The weight of final PPI is based on the value-add of products in the national accounts, while the weights of CPI are based on household consumption expenditures. For example, motor vehicles account for 12.6% in goods CPI but only 3.7% in final PPI, reflecting the large share of imported vehicles in goods CPI. Similarly, food accounts for 31.8% in goods CPI compared to 27.9% in final PPI. Resultantly, changes in the food component will be more pronounced in the goods CPI compared to the final PPI.[16]

[16] Additionally, the price of the items in CPI basket includes VAT and excise taxes which means that changes in these will cause changes in the CPI with no corresponding movement in PPI. PPI reflects the actual revenue collected by a producer.

Figure 9

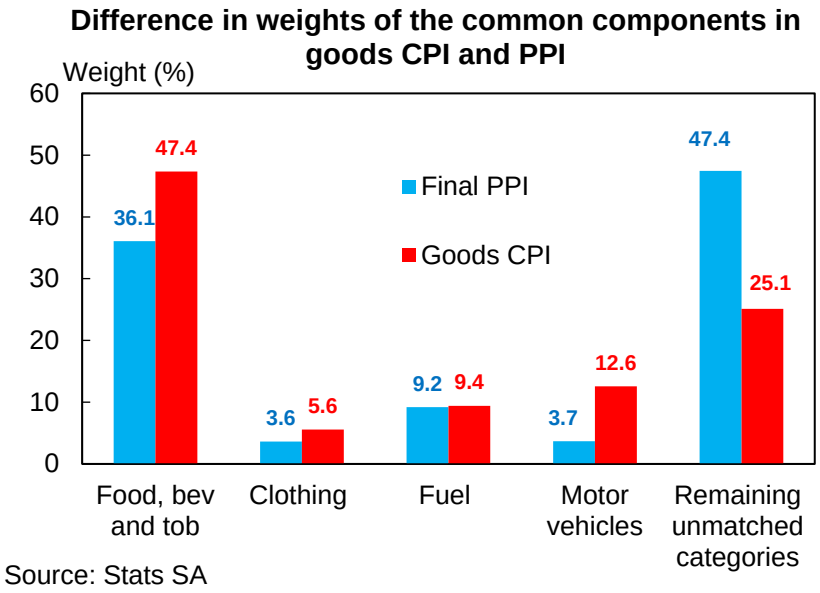
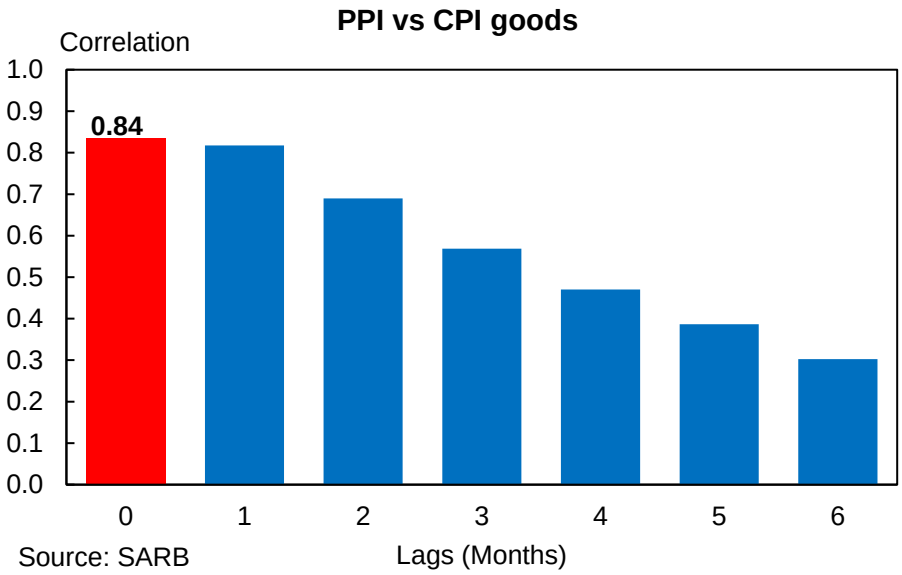


Figure 10 shows the results of running correlations tests between the goods CPI and final PPI. The relationship between these measures appears to be largely contemporaneous with the strongest correlation being 84%, at the t_0 period. This suggests that both final PPI and goods CPI are being driven by common factors such as oil, rather than final PPI driving goods CPI or vice-versa. However, the correlation is also strong at lags of 1 and 2 months, where final PPI is leading goods CPI.

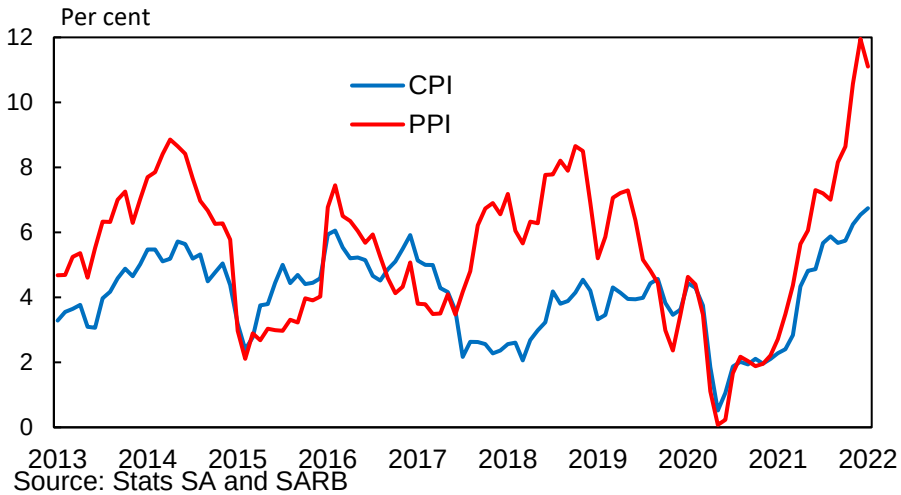
Figure 10



The high correlation co-efficient between final PPI and goods CPI is largely the result of the common items with large weights i.e., food, beverages and tobacco as well as petrol. These categories make up 56.8% of goods CPI and 42.4% of final PPI. Stripping out these goods, however, does not materially alter the relationship between the two series, barring the period of mid-2017 to mid-2019 (Figure 11). The co-movement over the sample is weaker with the correlation coefficient being only 52%. Again, the relationship is largely contemporaneous (Figure 12).

Figure 11

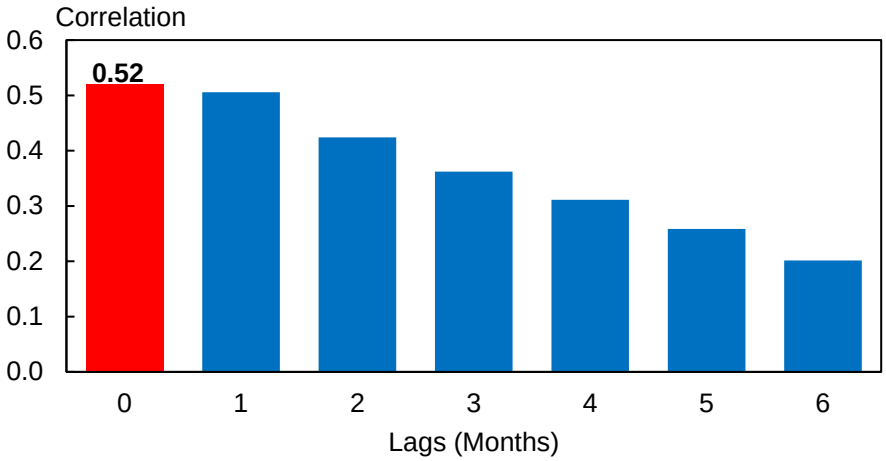
PPI and CPI (excl food, bev, tobacco & petrol)



Source: Stats SA and SARB
*Both indices exclude food, beverages, tobacco and petrol

Figure 12

PPI and CPI (.excl food, bev, tobacco & petrol)*

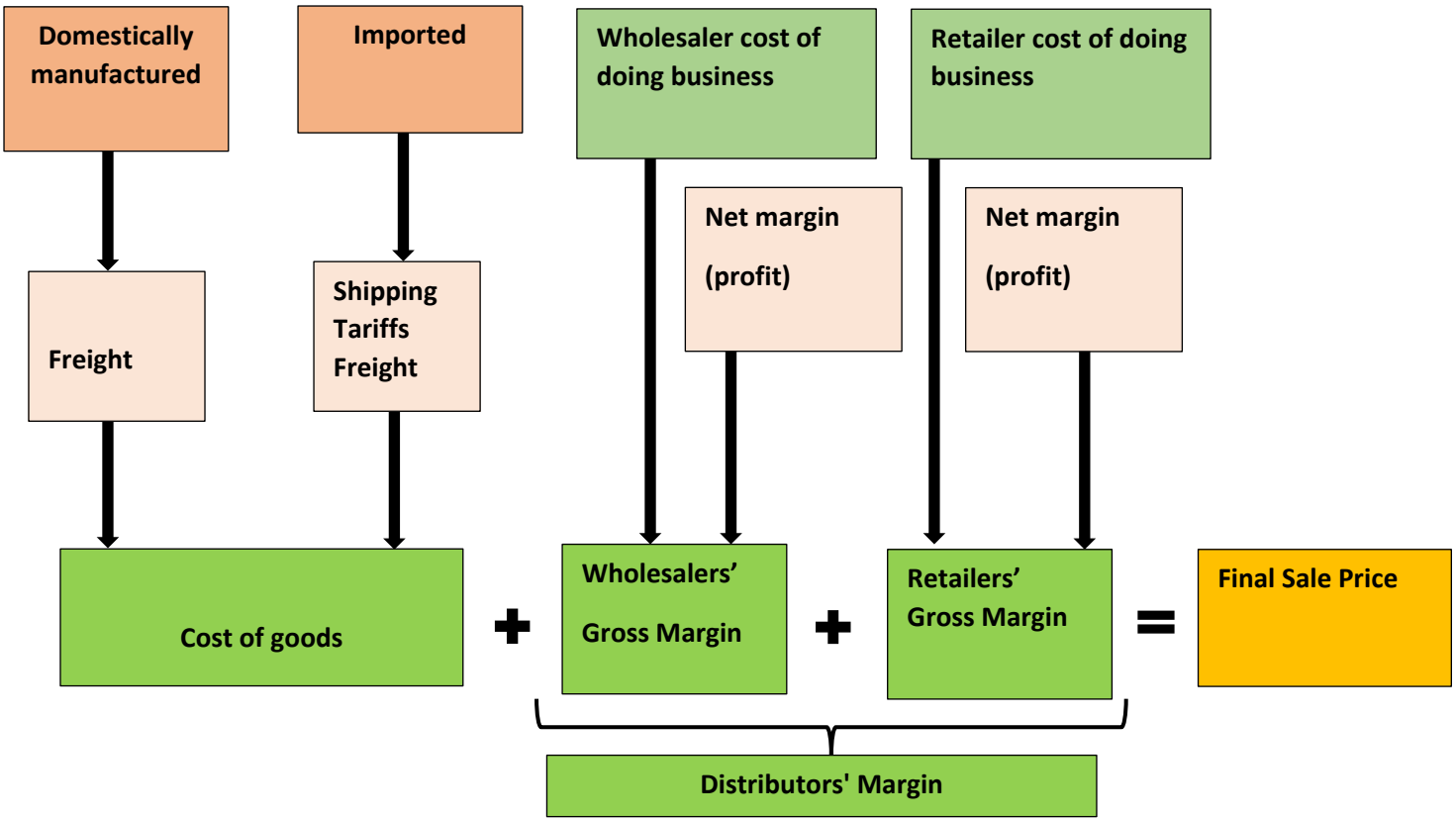


Source: SARB
*Both indices exclude Food, beverages, tobacco and petrol

3. Margin-squeeze as response to rising producer prices?

While the differences in the construction of the indices are important factors in explaining the incomplete pass-through from PPI to CPI observed in the literature, another key factor is the degree of competition in the economy or sector. Firms facing stronger competition may choose to absorb rising costs rather than passing the higher costs on to consumers and potentially losing market share.[17] Figure 13 below represents a stylised process of how goods move from producers to retailers. The various costs impacting the different stages of this process, and the degree to which these costs can be absorbed at each stage or passed on to the next level, contribute to the divergence of producer and retail prices.

Figure 13: The Supply Chain for Retail Goods



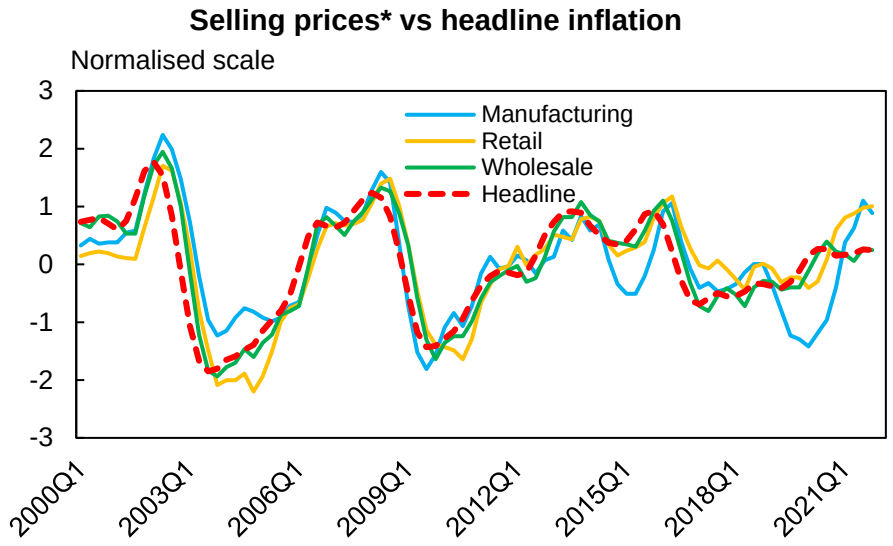
Source: Reserve Bank of Australia

Survey data give some insights on gauging the pervasiveness with which manufacturers and retailers are experiencing higher input costs and whether they are passing these costs to consumers or absorbing them. Normalising the survey price measures along with headline

[17] The competition effect (and cost absorption) is enhanced by operational efficiencies that allow firms to maintain lower mark-ups. While some local companies (e.g., in packaging industry, mining etc) have been able to benefit from surging prices of goods, downstream companies (e.g., food companies) have faced rising input costs. Morgan Stanley finds that these companies were able to absorb these costs because of cost-saving in other areas such as rent and perhaps modest wage growth.

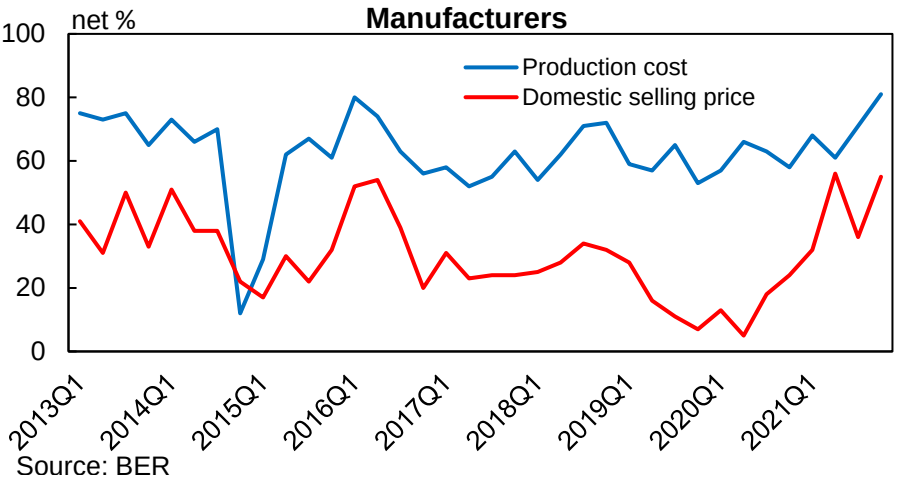
inflation shows a close correlation between survey measures and hard data (Figure 14). Figure 15 shows that a net majority of 81% of respondents in the manufacturing sector reported that production costs quickened in 2021Q4 compared to a year ago (largely because of higher prices for raw materials). However, only 55% of respondents have reported to have increased selling prices. Interestingly, more manufacturing firms have been able or willing to pass some costs through to consumers during the pandemic period compared to 2019. This may reflect stronger demand during the recovery from the 2020 GDP contraction. It may also be that margin compression has reached a critical level given the long period of weak demand and thus cost absorption, leaving firms with no option but to pass some costs onto consumers. A similar trend is evident at both the wholesaler and retailer levels (Figures 16 and 17).

Figure 14



Sources: BER,Stats SA and SARB
*Selling prices are net respondents indicating increase in sellling prices compared to the same period a year ago

Figure 15



Source: BER

Figure 16

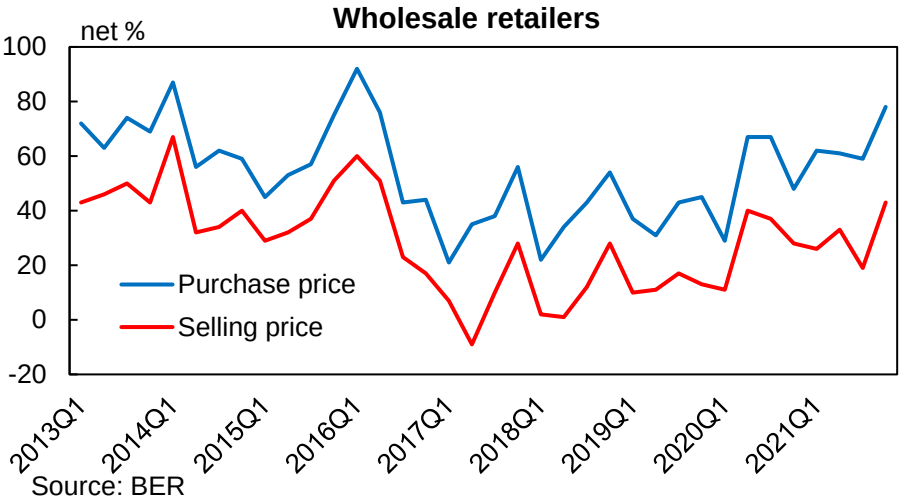
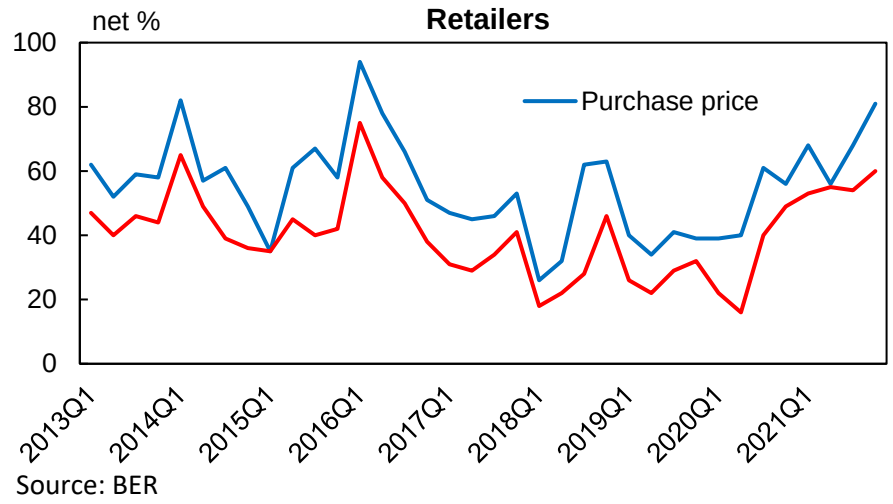


Figure 17



4. Conclusion

The sharp rise in PPI inflation over the past two years is causing some concern regarding the likelihood and extent of pass-through to consumer prices. The literature on the pass-through of PPI inflation to CPI inflation, and our qualitative analysis of the relationship between the two inflation measures, support the view that some pass-through should be expected, particularly when considering closely related baskets such as final PPI and goods CPI. However, the pass-through is intermediated by factors such as the degree of competition in consumer goods markets, the strength of consumer demand and the fundamental differences between the final PPI and the targeted headline CPI baskets. An additional concern, however, is the possibility that some sectors may have reached the limits to margin compression and may need to push through costs to the final consumer even if this comes at the expense of sales volumes.

Future research will quantitatively explore the relationship between PPI and CPI in South Africa. This should help shed further light on the degree of pass-through of producer prices to consumer prices, allowing for more precise conclusions.

OBEN 2201* – June 2022

Policy lessons from global retail CBDC projects

Nic Spearman

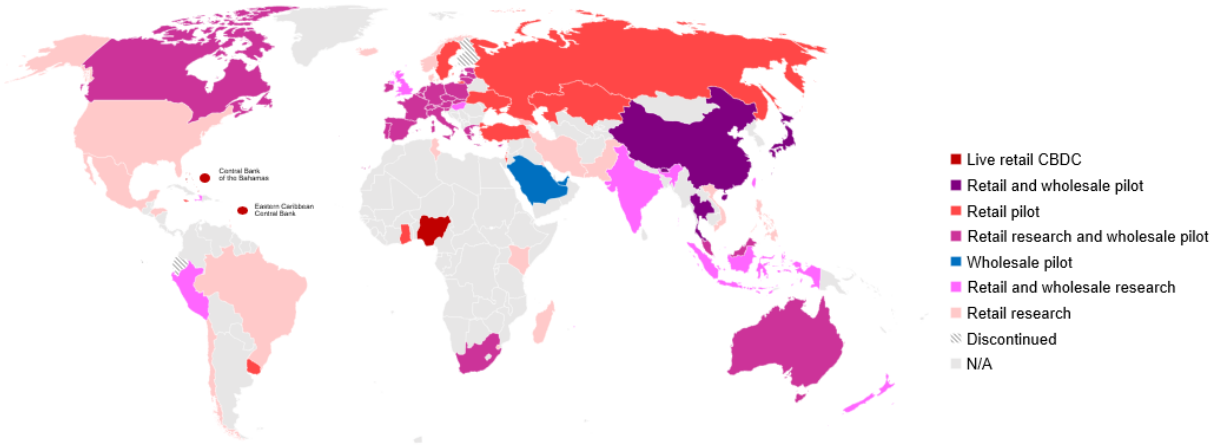
Abstract

Central banks world-wide are working to future-proof their role in a rapidly changing digital world. In this context, retail central bank digital currency (rCBDC) presents a potential tool for addressing key policy challenges going forward. These include monetary policy transmission, financial stability, payment system inefficiencies, and financial market failures. Addressing these challenges as well as improving integration with global payment systems are central to the SARB's strategic focus areas. Various rCBDC projects are in experimental stage working to assess policy uses and potential designs. These provide useful case studies for the SARB to understand the need for rCBDC and its potential policy spill-over effects. Understanding these impacts is important for ensuring the SARB's capacity to respond timeously and appropriately to the rapidly changing digital payment environment. For policy makers concerned by the prospect of currency substitution, a key economic lesson is that issuing rCBDC will not arrest currency substitution as it does not address the underlying economic factors that drive substitution.

1. Introduction

Interest in central bank digital currency (CBDC) is a global phenomenon as illustrated in Figure 1.[1]

Figure 1: Global CBDC projects



Sources: Auer, et al. (2020); BIS; SARB

[1] Figure 1 illustrates the status and scope of CBDC projects as at February 2022. We only include projects with sufficient information released officially to classify the status and scope of the projects. Additional projects had been announced but without sufficient information to indicate status and scope. These projects are therefore not included.

In this note, we review 57 global rCBDC[2] projects to identify and learn from the underlying policy issues motivating central bank interest in rCBDC. We find that the policy case motivating rCBDC projects differs depending on country-specific economic circumstances and the efficiency of respective national payments systems. We find that 22 central banks are developing rCBDC to achieve clear and specific policy objectives that fall within three broadly differentiated categories:

i. modernising the role of central banks in an increasingly digital economy;
ii. improving payment system efficiency and capability; and
iii. addressing domestic financial sector market failure and regulatory concerns.

We find that an additional 30 rCBDC projects are not targeting specific policy objectives but are exploring rCBDC as a general policy tool with central banks working to better understand the broad policy impacts and spill-over effects of CBDC. We find that a further three central banks have considered the case for rCBDC and concluded that there are currently no policy imperatives for developing rCBDC. Finally, we find two examples where rCBDC was implemented but later discontinued. These findings are summarised in Table 1.

[2] There are two types of domestically issued CBDC: wholesale and retail. Wholesale CBDC (wCBDC) is conceptually like reserve deposits but differs primarily in the technology underlying the system. Retail CBDC (rCBDC) refers to a central bank liability like wCBDC but made available to the public.

Table 1: Policy objectives motivating global rCBDC projects (February 2022)

Country	Modernising the role of central banks for the digital economy: Maintain monetary sovereignty and policy control	Modernising the role of central banks for the digital economy: Maintain public access to central bank liabilities	Improving retail payment efficiency and capability: Reduce the operational cost / complexity of issuing cash	Improving retail payment efficiency and capability: Facilitate cross-border remittances	Improving retail payment efficiency and capability: Promote regional payment integration	Improving retail payment efficiency and capability: Promote digital services innovation / interoperability	Improving retail payment efficiency and capability: Develop a new centralised government payment platform	Financial sector market failure and regulation: Foster financial inclusion	Financial sector market failure and regulation: Improve transparency / AML	General interest: Tool for mitigating general policy inefficacies	No compelling policy case: NA	Discontinued: NA
Australia [1]											x	
Bahamas [2]			x					x	x			
Bahrain [3]										x		
Bhutan [4]		x				x						
Brazil [5]										x		
Canada [6]	x	x										
Chile [7]										x		
China [8]	x						x					
Curaçao en Sint Maarten [9]			x		x			x	x			
Czech Republic [10]										x		
Denmark [11]											x	
Eastern Caribbean [12]						x		x				
Ecuador [13]												x
Eswatini [14]								x				
Eurozone [15]		x			x							
Finland [16]												x
Ghana [17]						x		x				
Georgia [18]								x		x		
Haiti [19]			x					x				
Honduras [20]										x		
Hong Kong [21]										x		
Hungary [22]										x		
Iceland [23]										x		
India [24]										x		
Indonesia [25]										x		
Iran [26]										x		
Israel [27]										x		
Jamaica [28]			x			x		x				
Japan [29]		x	x			x						
Kazakhstan [30]										x		
Kenya [31]					x	x						
Kuwait [32]										x		
Madagascar [33]										x		
Malaysia [34]										x		
Mauritius [35]										x		
Mexico [36]								x				
New Zealand [37]										x		
Nigeria [38]			x	x		x		x	x			
Norway [39]		x										
Pakistan [40]										x		
Peru [41]										x		
Philippines [42]						x		x				
Russia [43]				x		x		x				
Singapore [44]										x		
South Africa [45]										x		
South Korea [46]										x		
Sweden [47]												
Switzerland [48]											x	
Thailand [49]										x		
Trinidad and Tobago [50]										x		
Tunisia [51]										x		
Turkey [52]										x		
Ukraine [53]								x				
United Kingdom [54]										x		
United States [55]										x		
Uruguay [56]			x					x				
Vietnam [57]							x					

Notes:

[1] Australia: Reserve Bank of Australia (2019)
[2] Bahamas: Central Bank of the Bahamas (2019)
[3] Bahrain: Central Bank of Bahrain (2021)
[4] Bhutan: Royal Monetary Authority of Bhutan (2021)
[5] Brazil: Burgos & Batavia (2018)
[6] Canada: Bank of Canada (2020)
[7] Chile: Banco Central Chile (2021)
[8] China: People's Bank of China (2021)
[9] Curaçao en Sint Maarten: Centrale Bank van Curaçao en Sint Maarten (2018)
[10] Czech Republic: Czech National Bank (2020)
[11] Denmark: Danmarks Nationalbank (2017)
[12] Eastern Caribbean: Eastern Caribbean Central Bank (2021)
[13] Ecuador: White (2018)
[14]: Eswatini: Central Bank of Eswatini (2020)
[15] Eurozone: European Central Bank (2020); Brunnermeier & Landau (2022)
[16] Finland: Grym (2020)
[17] Ghana: Addison (2019)
[18] Georgia: National Bank of Georgia (2021)
[19] Haiti: Bank of the Republic of Haiti (2020)
[20] Honduras: Banco Central de Honduras (2021)
[21] Hong Kong: Hong Kong Monetary Authority (2021)
[22] Hungary: Magyar Nemzeti Bank (2021)
[23] Iceland: Central Bank of Iceland (2018)
[24] India: Reserve Bank of India (2021)
[25] Indonesia: Harahap, et al. (2017); Reuters (2021)
[26] Iran: Reuters (2018)
[27] Israel: Bank of Israel (2021)
[28] Jamaica: Haynes (2020)
[29] Japan: Bank of Japan (2020)
[30] Kazakhstan: National Bank of the Republic of Kazakhstan (2021)
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[37] New Zealand: Wadsworth (2018)
[38] Nigeria: Central Bank of Nigeria (2021)
[39] Norway: Norges Bank (2019)
[40] Pakistan: Baqir (2022)
[41] Peru: Montoros, et al. (2019)
[42] Philippines: Bangko Sentral ng Pilipinas (2020)
[43] Russia: Bank of Russia (2021)
[44] Singapore: Monetary Authority of Singapore (2021)
[45] South Africa: South African Reserve Bank (2021)
[46] South Korea: Bank of Korea (2020)
[47] Sweden: Sveriges Riksbank (2021)
[48] Switzerland: Swiss Federal Council (2019)
[49] Thailand: Bank of Thailand (2021)
[50] Trinidad and Tobago: Central Bank of Trinidad and Tobago (2018)
[51] Tunisia: Central Bank of Tunisia (2019)
[52] Turkey: Türkiye Cumhuriyet Merkez Bankası (2021)
[53] Ukraine: National Bank of Ukraine (2019)
[54] United Kingdom: Bank of England (2020)
[55] United States: Federal Reserve Board (2022)
[56] Uruguay: Central Bank of Uruguay (2017); Barontini & Holden (2019)
[57] Vietnam: Socialist Republic of Vietnam (2021)

Source: SARB

2. The role of central banks in the digital economy

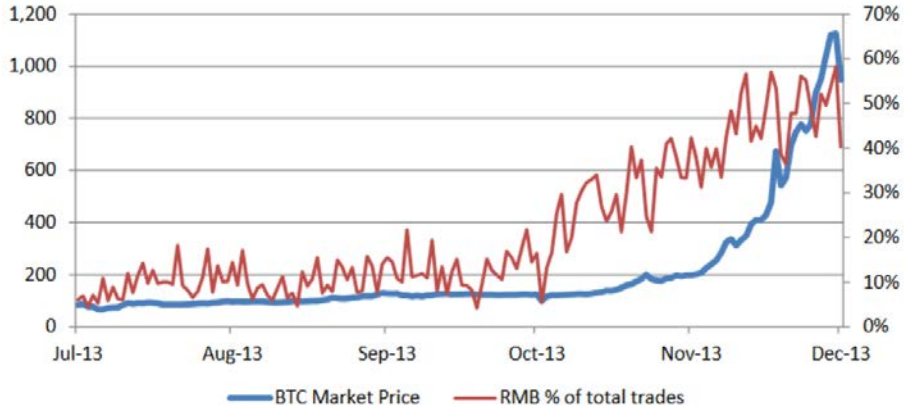
Concern about modernising the role of central banks in a rapidly changing digital world is one of the key policy factors motivating CBDC research especially among early CBDC projects. There are two key policy issues. First, is the potential for privately issued digital currencies to displace control of policy. This could occur through currency substitution. Second, is the potential for citizens to lose access to physical notes and coins as a payment medium. Here the impact is uncertain, but a key policy concern is that this loss of access could undermine the resilience of the payment system if payments become highly concentrated among a few dominant private digital operators.

Three seminal examples illustrate how central banks are thinking about rCBDC as a solution to these concerns and highlight the forward-looking approach of CBDC projects aimed at future-proofing central bank operations in an evolving digital economy.

Maintaining monetary sovereignty and policy control

Significant growth in renminbi financed Bitcoin trading activity in China (Figure 2), raised concern that private digital currencies could be used to displace the renminbi as a medium of exchange and undermine domestic policy control (BBC, 2013; Gloudeman, 2014). In response, the People's Bank of China (PBoC) launched the e-CNY rCBDC project in 2014 and prohibited financial institutions from dealing in Bitcoin to "protect the status of the renminbi as the statutory currency, prevent risks of money laundering, and protect financial stability" (Gloudeman, 2014). Various central banks have subsequently restricted cryptocurrency use.[3]

Figure 2: Bitcoin market price vs proportion of trading conducted in RMB



Source: Gloudeman (2014)

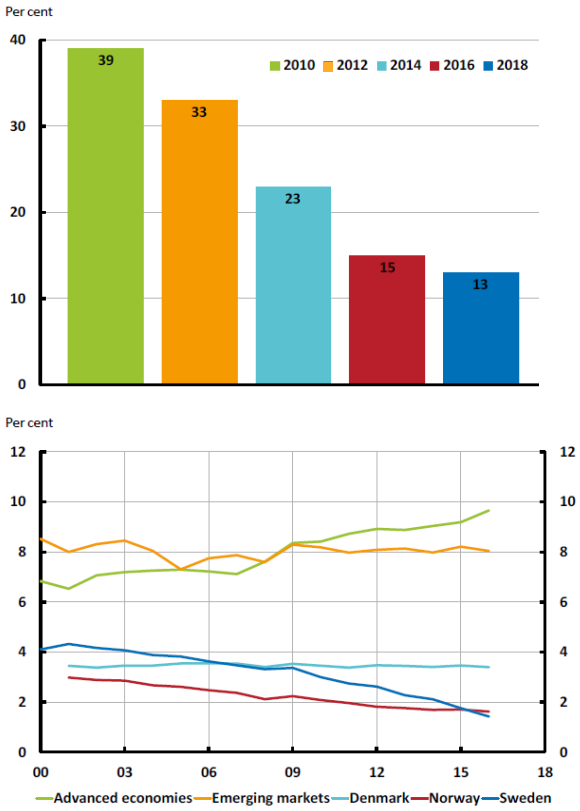
Maintaining public access to central bank liabilities

The PBoC has since indicated that "China's e-CNY system aims to create a new form of RMB that meets the public's demand for cash in the era of digital economy" (People's Bank of China, 2021). Likewise, the Sveriges Riksbank's e-Krona CBDC project, launched in 2017, was prompted by a declining proportion of cash payments in the retail sector in Sweden (Figure 3).

[3] See Orji (2022).

This raised concern that if digital payments came to be dominated by a few private operators, this could undermine competition and resilience in the financial sector (Sveriges Riksbank, 2017; 2021). In response, the e-krona project seeks to provide a digital currency and payment infrastructure that can function independently but along-side private owned infrastructure to enhance resilience and competition (Sveriges Riksbank, 2017; 2021).

Figure 3: Cash purchases in Sweden and comparative economies



(a) Percentage paying for their most recent purchase in cash in Sweden

(b) Cash as a percentage of GDP

Source: Sveriges Riskbank (2018)

Future-proofing the central bank's policy efficacy

Although declining cash use is not currently a general problem (Figure 3b), nor is currency substitution to privately issued digital currencies, many central banks list these as potential *future* concerns. For example, the Bank of Canada (BoC) lists both as the key policy issues motivating their rCBDC research program. But critically, while the BoC does not see these as *current* issues; the BoC's goal is to have a rCBDC ready for deployment as a *contingency technology* in preparation for change (Bank of Canada, 2020). This is an example of the forward-looking approach of many rCBDC projects.

3. Payment efficiency and capability

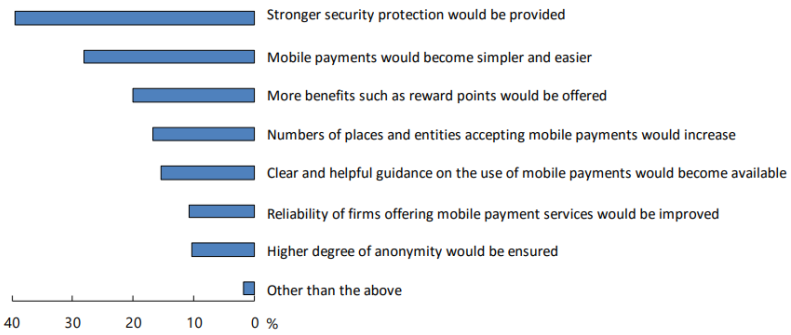
An increasingly important policy motivation for rCBDC projects is the opportunity for payment system modernisation. Related policy objectives include reducing the cost and complexity of

maintaining physical cash as a medium-of-exchange by providing a digital substitute to issuing physical cash; promoting regional payment integration by collaborating to redesign cross-border payment systems architecture; facilitating cross-border remittances by providing lower cost infrastructure; providing a catalyst for digital payment and financial services innovation by providing a blockchain enabled central bank-backed digital payment instrument; and even building new payment systems entirely.

Issuing a CBDC is not critical to achieving payment system modernisation objectives – CBDC is just one potential technology solution. However, central banks are well positioned to implement economy-wide payment infrastructure that can meet new and changing social needs making CBDC an important discussion point.

For example, changing demographics and migration into urban areas has reduced general cash circulation in Japan and put upward pressure on overall cash distribution costs especially to rural areas (Bank of Japan, 2020). However, cash remains a popular payment medium because privately issued digital money does not provide the same level of confidence as cash. An opinion survey by the BoJ highlights that a key factor discouraging digital payments in Japan is security concerns (Figure 4). The BoJ therefore sees a potential future need to issue CBDC to provide a more cost-effective digital alternative to cash as a payment medium, especially in remote areas of Japan (Bank of Japan, 2020).

Figure 4: Factors that would encourage more use of mobile payments in Japan



Source: Bank of Japan (2020)

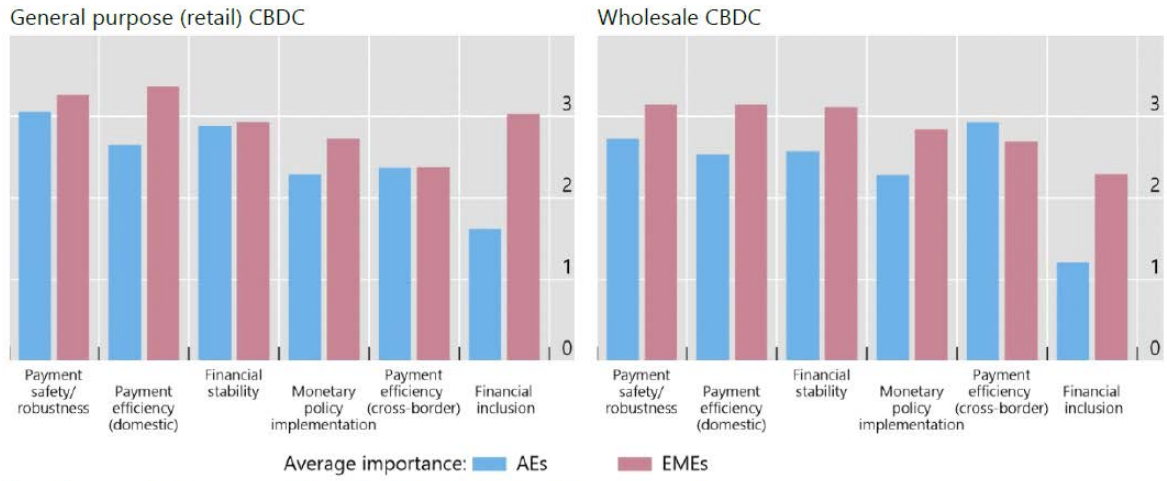
4. Domestic financial sector policy issues

A third broad category of policy objectives relates to domestic financial sector policy issues. These include promoting financial inclusion and improved anti-money laundering capabilities. The BIS's 2019 CBDC survey highlights that promoting financial inclusion is of more importance for emerging market economies than advanced economies (Figure 5). In this third category, policy objectives are not aimed at efficiency and capability, but instead at addressing specific local regulatory and market failure concerns.

Once again, these objectives do not specifically require a CBDC, but the need for market wide intervention places a central bank driven solution in an optimal position. The key questions for policy makers in these instances are, what is driving these regulatory and market failure concerns, and whether CBDC is an optimal policy tool for addressing them?

An illustrative example is the Sand Dollar, a CBDC version of the Bahamian dollar launched by the Central Bank of the Bahamas' (CBoB). An acute problem faced by the CBoB is that the rising cost of delivering financial services across the archipelago has led to a scaling back of private bank branch networks. This has exacerbated disparities in access to basic financial services due to infrastructure challenges, unstable communication and power, and a year-round risk of natural disasters. The result is that pockets of Bahamian society rely solely on cash as a means of transacting (Central Bank of the Bahamas, 2019). The Sand Dollar project aims to address this market failure by providing universal access to digital payments infrastructure and related services that the private sector is not adequately providing (Central Bank of the Bahamas, 2019).

Figure 5: Motivations for issuing CBDC



1 = not so important; 2 = somewhat important; 3 = important; and 4 = very important.

Source: Auer, et al. (2020)

5. A solution in search of a problem?

In many cases the motivation for rCBDC research is to better understand broad policy impacts and spill-over effects of CBDC, rather than addressing specific policy objectives. Potential spill-overs include monetary policy and financial stability impacts.

For example, the Bank of England (BoE) notes that issuing rCBDC could enable changes to the policy rate being passed on faster and more fully. But the BoE notes that issuing rCBDC could also disintermediate commercial banks raising financial stability concerns and disrupting the transmission of monetary policy (Bank of England, 2020). Similarly, the US Federal Reserve Board notes that the introduction of rCBDC could affect monetary policy implementation and interest rate control by altering the supply of reserves in the banking system, but the magnitude of the impact is uncertain (Federal Reserve Board, 2022). More research is therefore required to understand these impacts. However, at least one Fed Governor has expressed doubt that rCBDC would solve "any major problem confronting the U.S. payment system" suggesting that rCBDC is more like "a solution in search of a problem" (Waller, 2021). The UK House of Lords has expressed the same sentiment (House of Lords Economic Affairs Committee, 2022).

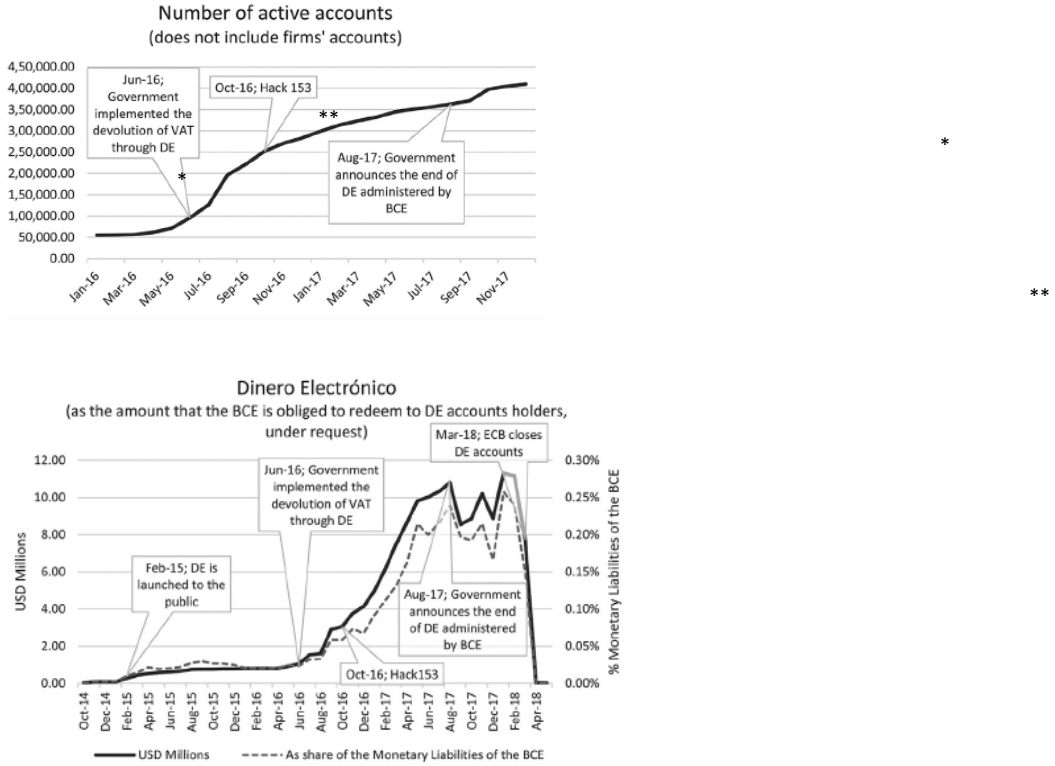
Further to this point, three central banks have researched the domestic policy case for rCDBC and concluded there is no policy case for developing a rCBDC at present. The Reserve Bank of Australia (2019; 2021) has indicated that it is "not yet convinced that a strong policy case has emerged" for a rCBDC in Australia finding that Australia is already well served by a wide range of safe, convenient, low-cost and efficient real-time retail payment methods, and that "much (if not all) of the innovation and new functionality that could potentially be enabled by a CBDC could in principle also be enabled by innovation based around commercial bank deposit accounts, e-money or stablecoins". The Swiss Federal Council (2019) has likewise indicated that rCBDC would not currently bring "additional benefits" to Switzerland. Similarly, the Danmarks Nationalbank (2017) has expressed concern that a CBDC would bring additional risk without additional benefits that are not "already covered by the current payment solutions".

6. Lessons from projects implemented but discontinued

Two case studies focusing on discontinued projects highlight that, apart from the importance of identifying clear policy (supply side) objectives for issuing a digital central bank digital currency, a valued consumer (demand side) use case is also important.

The first case study highlights the importance of an underlying consumer use case for ensuring viability when weighed against the costs of maintaining the system. In 1992, the Bank of Finland (BoF) launched the Avant smart card system. Avant smart cards issued by the BoF could be preloaded with digital currency using a network of authorised loading points. The Avant smart card was positioned as a low-value payment card intended to pre-emptively avoid fragmentation of the payment market leading to over-investment and a lack of standards (Grym, 2020). Using the Avant card was initially cost-free, but fees were later added to cover the costs of operating the system. At the same time, the cost of using debit cards was decreasing. Ultimately, the Avant card system did not offer a compelling cost-effective consumer use case and debit cards gained wider acceptance leading to the discontinuation of Avant cards in 2006 (Grym, 2020).

Figure 6: Diner Electrónico (DE) accounts



(a) Number of DE accounts (b) Value of DE held

Notes:
* The Ecuadorian government launched a program whereby DE users received a rebate of 2 percentage points off VAT paid.
** The Ecuadorian government, NGOs, and private firms organized the Hackathon HACK153 to develop solutions using DE.

Source: Arauz, et al. (2021)

The second case study highlights that issuing rCBDC will not arrest currency substitution without addressing the underlying economic factors that drive substitution.[4] In 2015 the Central Bank of Ecuador (CBoE) began issuing digital US dollar backed digital currency accounts but discontinued in 2018 following low adoption (Figure 6).[5] Ecuador's dollarised financial system had brought financial stability and low inflation, but had constrained domestic policy. In this context, White (2018) argues that dollars on deposit at private commercial banks were regarded as less risky than CBDC dollars on deposit at the central bank. This is because private banks had commercial incentives to behave prudently whereas legislation specified no limit on the volume of CBDC dollars the CBoE could create, and no prudential requirement that the central bank hold adequate assets to redeem them (White, 2018). The CBoE's CBDC therefore did not provide a credible substitute to US dollars.

4 Melvin (1988) and Reinhart, et al. (2003) find that substitution is primarily driven by macro instability. With regards to issuing rCBDC as a strategy to discourage substitution towards decentralised payment systems such as Bitcoin, this strategy overlooks the fact that decentralised systems are specifically designed to provide users with an alternative to centralised systems like a CBDC.

5 Despite the CBoE's expectation that 500,000 people would sign up in 2015, less than 50,000 were opened in 2015, and holdings accounted for less than 0.05% of Ecuador's monetary liabilities (White, 2018; Arauz, et al., 2021).

7. Key take aways for the SARB

Central banks world-wide are working to future-proof their role in a rapidly changing digital world. In this context, rCBDC presents a potential tool for addressing key policy challenges going forward. These challenges include policy transmission, financial stability, payment system inefficiencies, and financial market failures. Addressing these challenges as well as improving integration with global payment systems are central to the SARB's strategic focus areas and the National Payment System Framework and Strategy (South African Reserve Bank, 2018). It is therefore important that the SARB continue engaging with and learning from international rCBDC experiences to further assess rCBDC as a policy tool.

Apart from considering rCBDC as a solution to supply-side policy challenges, it is also important for policy makers to understand the demand-side consumer use case. It is not enough for policy makers to issue CBDC for policy purposes; consumers must want and value it too. This need is important for assessing the viability of a rCBDC when weighed against the costs of maintaining the system. This is also an important consideration for policy makers concerned by the prospect of currency substitution towards private or externally issued digital currencies. Unless rCBDC directly addresses the underlying demand for substitution, issuing rCBDC is unlikely to mitigate substitution. This is worth emphasising as few documents reviewed provided demand-side evaluation or discussion.

rCBDC therefore presents a potential policy tool, but it is not yet clear that it provides an optimal tool for achieving specific policy objectives. We recommended that the SARB continue engaging with global CBDC research as well as key stakeholders to understand the need for rCBDC in South Africa and abroad and its potential policy spill-over effects. This will be important for ensuring the SARB's capacity to respond timeously and appropriately to the rapidly changing digital payment environment.

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OBEN 2201* – June 2022

Revisiting EM economic development and convergence

Jean-François Mercier

Abstract

Long-term convergence of emerging countries towards advanced economies' income/capita levels has never been generalized nor consistent, even though the share of countries that converged has risen since 2000. Broader adoption of stability-oriented macro policies and trade/capital account opening probably facilitated a greater degree of convergence, but it seemed to be neither a sufficient (nor in some cases necessary) condition. Failure by many countries to successfully reallocate resources towards sectors with higher productivity gains may explain why they failed to match the performance of dynamic Asian economies, or even converge at all. The need to expand high value-added manufacturing and services sector appears strong in South Africa, which remains a commodity-dependent economy with a limited skills base and insufficient productivity growth.

1. Introduction

Emerging economies (EM) typically strive to converge, over time, towards income levels of advanced economies (AE). National governments publish development plans; international organizations offer funding and advice to achieve the goal. Conventional wisdom would indeed suggest that in an open world, an emerging country should be able to import technologies from AEs, build its capital stock – if necessary, through external financing – and hence reduce its productivity gap with AEs.[1] But the experience of the past 50 years shows that convergence is neither constant over time, nor universal. Many countries only experience short bursts of convergence; some, like South Africa, have diverged over time.

Referring to academic literature that analyse the different models of development and their shortcomings, this note looks at the incidence of convergence in medium- to large EMs over the past few decades, and at empirical evidence of correlation with potential drivers of development. It then looks at potential policy responses for countries like South Africa, in an environment where the further integration of EMs in the global economy may be more challenging than in the recent past.

[1] Classical economic theory also suggests that as EMs have relatively low capital/labour ratios, returns on capital should be high enough to entice investment.

2. Changing views on convergence over time

For decades, economists tended to argue that unconditional convergence[2] was an unlikely scenario. The Prebisch-Singer hypothesis, developed in the 1940s, argue that the relative price of primary products – which EMs disproportionally produce and export – falls over time, because primary products have a lower income elasticity of demand. Hence, commodity producers will face declining terms of trade. This hypothesis provided support for import-substitution industrialization policies followed by several EMs (for example, India) in the 1950s and 1960s, but later found to deliver insufficient development.[3] Later, Romer (1986) favoured a model with increasing returns-to-scale technology, which enables rich countries to maintain or increase their lead; while Baumol (1994) argued that only countries with adequate initial levels of human capital endowment could converge, with the poorest countries being left out.

The late 1980s and 1990s saw a shift in the paradigm and, with the emergence of the "Washington consensus", a greater focus was placed on adopting the right set of policies (macro stability, trade and financial opening, deregulation) to drive convergence. In 1995, Sachs and Warner argued that previous analyses were too pessimistic as to the ability of poor countries to converge; and missed the crucial role of efficient institutions. Using two metrics for appropriate policies (respect of property rights and integration in global trade), the authors found that countries that met both criteria generally experienced strong convergence in the 1970s-1980s. Barro (1996) echoed this argument, pointing out the benefits for growth from the rule of law, free markets, education, and small government consumption.

3. Empirical evidence: uneven convergence

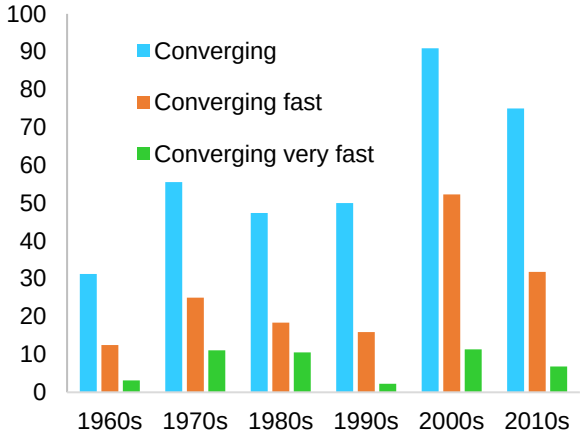
Historical data do suggest that economic convergence has rarely been the norm and has not always been sustained. To assess the existence of convergence, we analyse trends in GDP per capita (in 2015 US$, from the World Bank database) for a sample of 44 medium to large EMs since 1960 and compare it to the average GDP per capita of high-income countries. In each of the last four decades of the 20th century, only about half of our sample countries converged; and the percentage of those converging "fast" or "very fast" was even lower.[4] Progress was much improved in the 2000s – a period characterized by strong global growth, high demand from China and a commodity "super-cycle" – but again partly reversed in the past decade (Figure 1).

2 Unconditional convergence implies that a developing country will converge irrespective of policies put in place to achieve that goal.

3 Adhia (2015) points out that between 1966 and 1980 India's per capita income grew on average by less than 1% a year, despite a heavy focus on industrial development following independence in 1947.

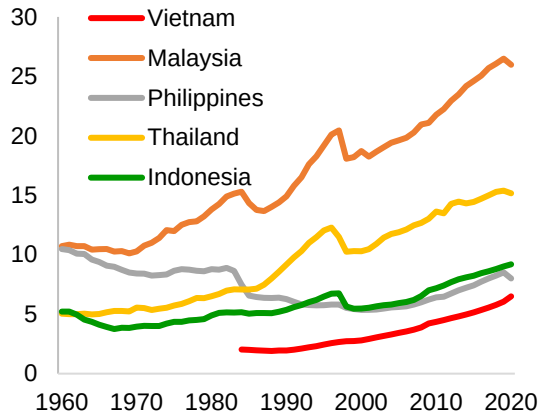
4 A country is described as converging "fast" or "very fast" when its GDP per capita (expressed as a share of the high-income average) increases by more than 25% or 50%, respectively, within the 10-year period.

Figure 1: Share of EMs converging towards high-income GDP/capita



Source: World Bank

Figure 2: GDP/capita share of high-income in SE Asia



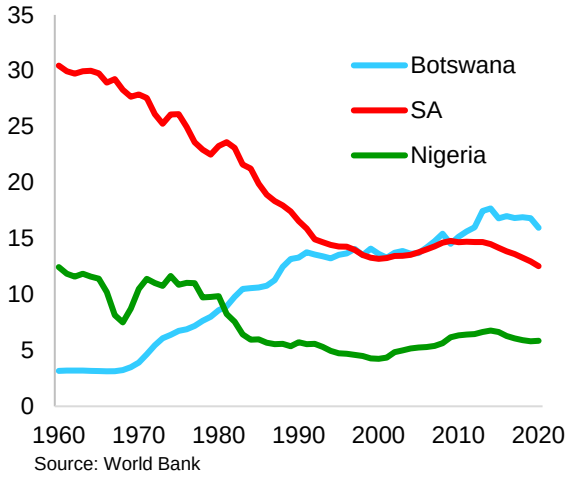
Source: World Bank

Regional performances are also quite disparate. Most countries in South-East Asia have experienced a steady convergence – barring a temporary setback around the 1997-98 Asian crisis – as have most eastern European economies since 2000 (Figure 2). By contrast, the performance of Latin American countries is disappointing, except for Chile between the mid-1980s and the early 2010s. Within Sub-Saharan Africa, while countries like Ethiopia and Rwanda were "fast convergers" in the 2000s and 2010s, South Africa and Nigeria have tended to diverge over time. From about 30% of the high-income average in 1960, SA's GDP per capita had fallen to 13% by 2010 and has broadly stagnated since, despite some moderate convergence in the 2000s (Figure 3).

Of course, the starting point should influence the speed of convergence: Hence, under the right conditions, it should not be a surprise to see a low-income country like Ethiopia converge faster than an upper-middle income one like Chile. But even after controlling for the starting point, the pace of convergence is highly uneven. Figure 4 shows how even "good" performers over time, like Malaysia, Thailand or Botswana, did not experience anything close to the fast catch-up of China, Korea or Taiwan once their GDP per capita had reached 10% of the high-income average. The spectacular growth of China since 2000, just like that of the Dynamic Asian Economies[5] in the 1970s/80s, remains an exception.

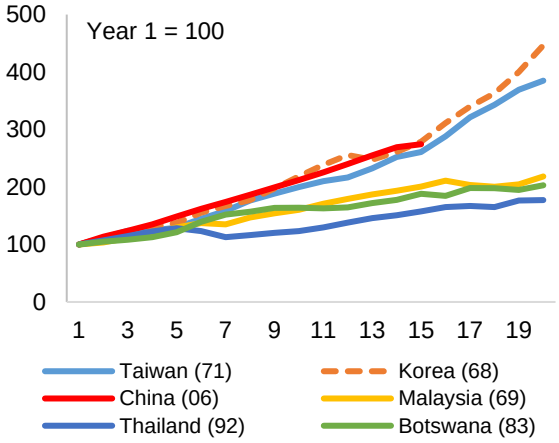
[5] Korea, Taiwan, Singapore, and Hong Kong

Figure 3: GDP/capita share of high-income in Africa



Source: World Bank

Figure 4: Compared rise in real GDP/capita beyond 10% of AE income levels



4. The debatable role of policies and institutions

What explains this uneven performance? The significant increase in the percentage of "convergers" after 2000 would appear to support the arguments of Sachs and Warner (op. cit.) about the role of policies and institutions. Countries seemed to reap the benefits of earlier reforms that (among others) increased the independence of central banks, set inflation targets, lowered tariffs, and liberalized capital accounts. Both inflation and inflation volatility subsequently declined from earlier decades, as did the volatility of real effective exchange rates and the frequency of EM financial crises (including defaults).[6]

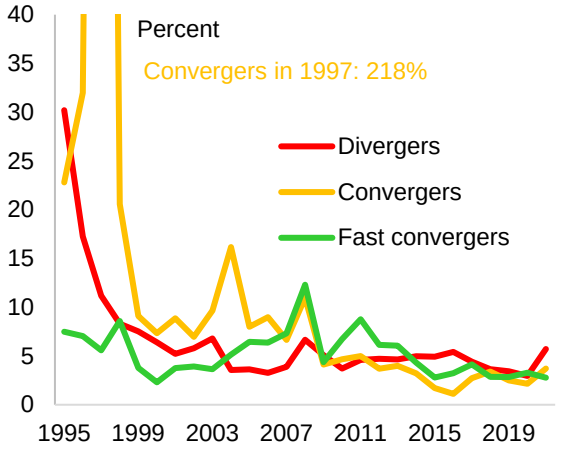
However, such an explanation may have its limitations. First, the percentage of converging countries declined after the GFC, potentially indicating that the 2000s performance partly resulted from exceptional circumstances (China's outsized demand growth, the commodity super-cycle, expansion of global value chains). Second, improved inflation performance occurred both in countries that converged and diverged, including Brazil or Peru, which put the hyperinflation episodes of the 1980s behind them and also liberalized their trade and capital accounts. In fact, comparing average inflation across "convergers" and "divergers" does not show meaningfully different patterns of late (Figure 5).[7] This echoes the argument of Easterly (2004) that while "extremely bad" policies will result in clear growth under-performance, the impact of policy changes becomes negligible when both the starting and end points fall within a moderate range.

6 Reinhart (2019) identifies "missing defaults" in EM in the wake of the Global Financial Crisis, in contrast to earlier periods of joint declines in capital flows and commodity prices.

7 We select three samples of EMs based on their relative growth performance: "Fast convergers" (India, Malaysia, Thailand, Sri Lanka, Vietnam, and Bangladesh); "other convergers" (Philippines, Indonesia, Dominican Republic, Costa Rica and Bulgaria); and "divergers" (Argentina, Brazil, Peru, Mexico and South Africa).

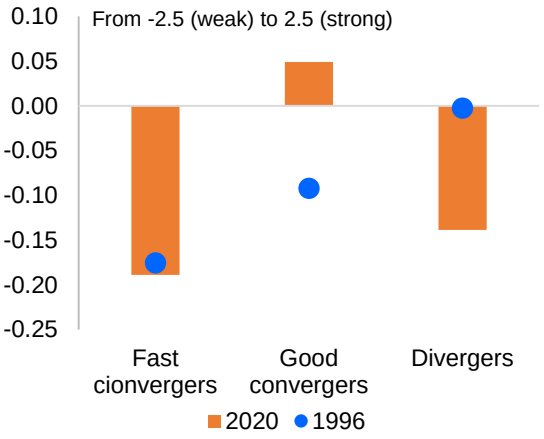
To assess more specifically the impact of institutional quality, we compare countries' average score on the World Bank's governance indicators.[8] Again, the evidence is mixed. Unlike other sub-groups, the "divergers" see on balance a deterioration in their average score from 1996 to 2020; but that score is still, on balance, better than that of the "fast convergers" (Figure 6). Looking at each indicator, there appears to be some correlation between relative growth performance and rule or law or government effectiveness, in contrast to other metrics. But individual performance varies even within sub-groups. For example, South Africa does better on most metrics than Indonesia, the Philippines and Thailand; yet it diverges while they converge. Furthermore, comparing development performance to institutional quality raises an endogeneity issue: While the latter helps growth, it also tends to improve as an economy develops and incomes rise.[9]

Figure 5: Average inflation in selected EM groups



Source: World Bank

Figure 6: Average governance scores for selected EM groups



Source: World Bank

5. Challenges in overcoming the "resource curse"

Relying on commodity exports tends to undermine convergence. Figure 7 and Appendix 1 illustrate the paucity of commodity-dependent countries (CDCs) among "fast convergers", even in the 1970s and 2000s when commodity prices rose strongly.[10] Commodity-dependency affects more than 50% of EMs according to UNCTAD and is hard to move away from, with about three-quarters trapped in that situation for decades.

Most economists acknowledge the existence of a "resource curse" but disagree over how commodity-dependency undermines growth. Hansen (2013) highlights the dominance of the commodity sector by foreign firms with few incentives to create linkages with other domestic sectors. Isham et al. (2005) argue that some commodities (that are typically extracted from a narrow geographical or economic base) are more prone to rent-seeking behaviour, which in turn is damaging to institutional development.

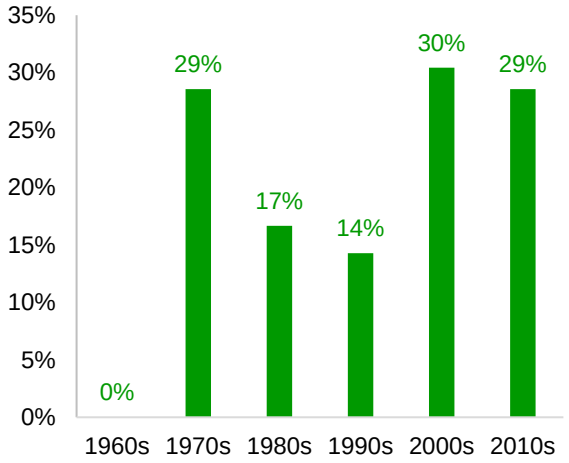
8 These indicators include voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption.

9 Authors such as Rodrik, Easterly, Goldin acknowledge this endogeneity.

10 We use the UNCTAD definition, which classifies a country as commodity export dependent when more than 60 per cent of its total merchandise exports are composed of commodities.

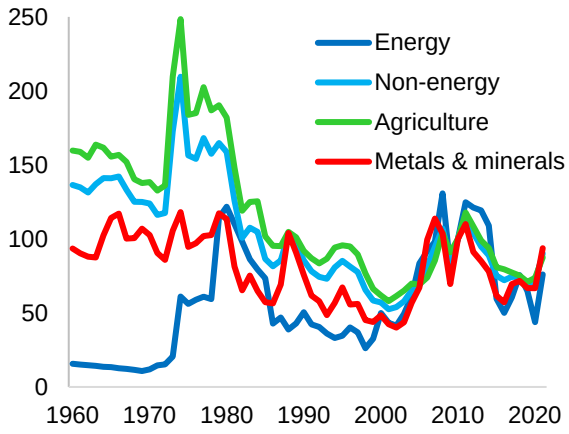
Others point to diminishing returns in the primary sector that result in a decline – and greater volatility – in relative prices of commodity exports, though Frankel (2010) disagrees. Historical experience does suggest that relative prices of farm and (to some extent) metal commodities fall over time (Figure 8). Sachs and Warner (1995, op. cit.) acknowledge the existence of a "resource curse" but argue that subsequent weak growth may result from the wrong policy response, such as protectionism.

Figure 7: Percentage of CDCs among "fast convergers"



Source: World Bank and SARB calculations

Figure 8: Commodity price indices deflated by the US CPI



Source: World Bank and SARB calculations

6. Sectoral productivity and allocation

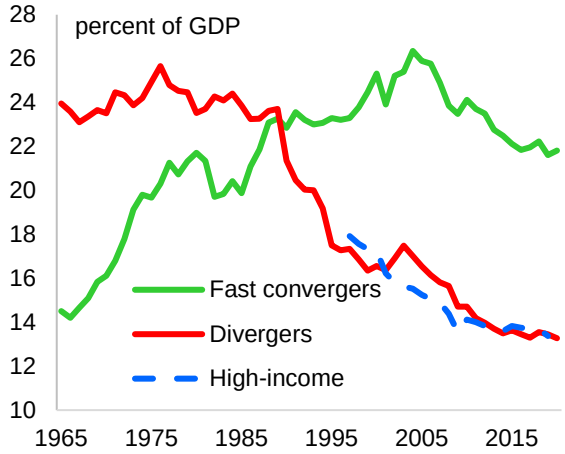
Beyond moving out of commodity dependency, the ability to both generate productivity gains and shift resources to sectors with high-productivity potential may hold a key to convergence. Rodrik (2011) observed evidence of unconditional convergence across EMs in specific economic sectors, irrespective of factors like policies and institutions. But it is not uniform across industries; and sectors like machinery/equipment and high value-added services offer greater potential than others.

The challenge for EMs is thus to re-allocate resources to these sectors; but insufficient workforce education and skills typically stifles such efforts. Economic liberalization may result in productivity growth in some sectors (e.g. manufacturing) but if this happens through rationalization and job-shedding, labour then often shifts to lower-productivity sectors, with limited growth benefits for the economy as a whole. Diao, McMillan and Rodrik (2017) witnessed such patterns in Latin America, in contrast to Sub-Saharan Africa – where resource reallocation, especially from agriculture to the secondary and tertiary sectors, helped growth but within-sector productivity gains were weak. Except India, no country was able to combine benefits from both within-sector productivity gains and resource reallocation, as the "Asian Tigers" had achieved earlier.

A related debate is whether a developing economy (especially a commodity-dependent one) needs a sizable and growing manufacturing sector to converge. UNCTAD identifies many CDCs that shifted resources from primary to tertiary sectors in the last 25 years; however,

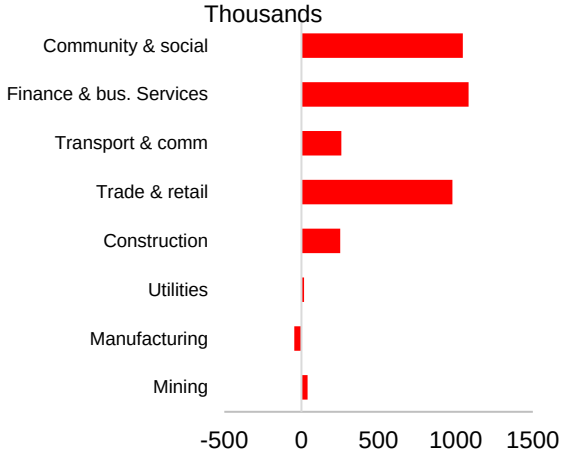
resources often moved to low-productivity services, limiting convergence opportunities. A longer historical comparison shows that in five "fast converging" economies, manufacturing initially rose as a share of GDP before stabilizing at high levels; by contrast it fell on average in five diverging ones, including South Africa (Figure 9). In effect, the latter "de-industrialized" in similar fashion to high-income countries without having achieved convergence.[11]

Figure 9: Manufacturing value-added in selected groups



Source: World Bank

Figure 10: Change in SA employment from 2002 to 2019



Source: Stats SA (QES)

7. Policy implications for South Africa

South Africa's failure to reverse earlier divergence appears at odds with policies followed since democratization and their outcomes (lower and more stable inflation, increased trade and financial openness). Possibly, these policies, by themselves, "were not enough." This is not to argue that stability-oriented policies should be abandoned: On the contrary, as Easterly or Rodrik (op. cit.) argue, a shift away from "moderate" policies can have very damaging effects on growth. In SA's case, improving public finances appears crucial to reduce premiums on borrowing costs and "crowding-out" of private-sector investment. Equally, reversing the deterioration seen in some governance indicators over the past 20 years or so may help restore what was (post-1994) one of South Africa's comparative advantages (versus many other EMs) to attract investment.

But while such steps would probably help potential growth, they might not be enough to lift it by the required amount – maybe at least 2-3 percentage points – to achieve sustained convergence. In recent decades, SA suffered from both declining productivity growth and a reallocation of labour resources towards low-productivity sectors (such as public and social services, retail or informal employment – Figure 10). This occurred even as SA was able to attract, up to recently, a similar share (relative to GDP) of external capital as EM peers. But such flows appeared to fund public deficits and financial investments rather than real-economy, productivity-enhancing investments.

[11] For this comparison, the fast convergers are Korea, Singapore, Malaysia, Thailand, and Sri Lanka; the divergers are Argentina, Brazil, Mexico, Peru, and SA.

Shifting a greater share of resources to higher value-added manufacturing or services may be needed, including to boost know-how, "learning by doing" and innovation (and thus help remedy poor educational outcomes, which would take years to fix). Even a diversification of the primary sector into more diverse exports (including in agriculture) might assist with labour absorption and rural development.[12] Yet, export-oriented strategies may become challenging if global trade flows grow by less than in recent decades, and "latching on" global supply chains become harder as the latter are shortened. In addition, Asian economies have by now established a dominant position in many product markets which may be hard to challenge.

Rodrik (op. cit.) suggests "opportunistic" approaches like special economic zones, subsidised credit, tax incentives can be "shortcuts" to help achieve successful resource reallocation. However, SA policymakers may first need to address structural constraints, such as rail or power infrastructure or regulatory uncertainty, to maximise the impact of any such steps and reduce the risk of wasting public money.

8. Conclusion

Economic convergence of EMs towards rich countries' income levels has improved in recent decades; yet it is far from being the norm and may prove more challenging in coming years in an environment of slow global potential growth and rising protectionist pressures. The fast convergence of China in the last few decades appears an exception that will be hard to match. Better macro policies and improved governance may not be sufficient to shift a country like South Africa onto a significantly higher growth path. In the longer run, stronger growth – that reverses the widening income gap between SA and high-income economies (or successful EMs) – may require a reallocation of resources to higher-productivity sectors.

[12] UNCTAD and the World Bank cite the example of Costa Rica, which achieved both income convergence and reduced commodity dependency, by reducing its initial reliance on coffee and banana exports and focusing on export diversification (including through a broader range of agricultural exports).

Appendix: List of non-OPEC emerging countries that experienced fast convergence over respective decades

Fast convergence is defined as having GDP per head – expressed as a share of the high-income average – that expands by more than 25% within ten years. Commodity-dependent countries are highlighted in blue.

1960s	1970s	1980s	1990s	2000s	2010s
Korea	Botswana	Botswana	Chile	Angola	Bangladesh
Singapore	Brazil	China	China	Bangladesh	China
Taiwan	Hong Kong	Hong Kong	Korea	Bulgaria	Cote d'Ivoire
	Korea	Korea	Malaysia	China	Ethiopia
	Malaysia	Taiwan	Sri Lanka	Dom Rep	Ghana
	Singapore	Thailand	Taiwan	Ethiopia	India
	Taiwan		Vietnam	Hong Kong	Indonesia
				India	Philippines
				Indonesia	Poland
				Korea	Romania
				Nigeria	Rwanda
				Panama	Sri Lanka
				Peru	Turkey
				Poland	Vietnam
				Romania	
				Russia	
				Rwanda	
				Singapore	
				Sri Lanka	
				Taiwan	
				Tanzania	
				Thailand	
				Vietnam	

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