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Slowly fading shocks: Unpacking demand- and supply-drivers of PCE inflation

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- In this *Economic Note*, we outline and apply the Shapiro (2024) methodology for decomposing inflation into demand and supply drivers for South Africa using quarterly personal consumption expenditure data.
- We show that while the initial post-COVID inflationary impulse may have been due to strong pent-up demand, negative supply shocks ultimately came to dominate and pushed inflation even higher.
- The decomposition shows that the demand-driven component of PCE inflation has eased in 2024, returning closer to pre-pandemic levels. The main reason for the slow pace of disinflation observed in the first half of 2024 can be explained by the slower remission of supply shocks. Only more recently have the lingering effects of these past supply shocks started to wash off.
- These results are robust to alternative specifications.

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1. Introduction[1]

In recent years, much attention has been placed on understanding demand and supply sources of inflation. In 2021 and 2022, as inflation surged, the focus of this research was to help calibrate the appropriate monetary policy stance. More recently, this work has helped with assessments of monetary policy's effectiveness as disinflation has progressed. Literature on demand and supply drivers of inflation points to inflation having initially been the result of the confluence of strong post-pandemic demand and severe supply-chain bottlenecks, with the Russia-Ukraine war and its impacts on commodity prices (energy and food) exacerbating the acceleration in inflation.[2] As these supply constraints have unwound, and demand cooled, inflation has eased.

One of the more popular methodologies of assessing demand and supply drivers to have emerged is the framework proposed by Shapiro (2024) that decomposes monthly personal consumption expenditure (PCE) inflation in the United States (US) into demand and supply drivers using category-level data. This framework has been applied to various other countries and tailored in different ways (for example, using retail trade data where high frequency PCE data is not available).[3]

In this *Economic Note*, we decompose South Africa's inflation into demand- and supply-driven factors using the Shapiro (2024) methodology. To our knowledge, this is the first time that the Shapiro methodology has been applied to South African PCE data.[4] Although South Africa's inflation has dipped below the 4.5% target in recent months (mainly reflecting fuel deflation), it was sticky above the midpoint for much of the first half of 2024.[5] With this *Note*, we show how the slow dissipation of supply-driven inflation has contributed to inflation stickiness, and, in the process, highlight how this methodology may be a valuable addition to the existing inflation analysis toolkit.

2. Methodology and data

2.1 Theoretical model and shock identification

The theoretical assumptions that underpin the Shapiro (2024) methodology are economically intuitive. The framework assumes that for some category of personal consumption expenditure, i, the supply curve is upward sloping while the demand curve slopes downwards:

$$Supply\ curve: q_i = \sigma^i p_i + \alpha^i \tag{1}$$

$$Demand\ curve: p_i = -\delta^i q_i + \beta^i \tag{2}$$

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1 The authors would like to thank Neryvia Pillay, Witness Simbanegavi and seminar participants for their useful comments and insights.

2 See, for example, Eickmeier and Hofman (2022), OECD (2022), Blanchard and Bernanke (2023), and Firat and Hao (2023).

3 See Gonçalves and Koester (2022), Beckers, Hambur and Williams (2023), Firat and Hao (2023), Akarsu and Aktuğ (2024) and Dudson (2024).

4 Firat and Hao (2023) do a cross-country decomposition, and South Africa is included but not in a lot of detail and only includes seven expenditure categories.

5 Headline inflation in South Africa currently sits at 2.9% in November 2024 but averaged 5.3% in the first six months of 2024.

where q_i and p_i represent quantity and the price level, respectively. σ^i and $-\delta^i$ are the slope parameters and α^i and β^i are the respective intercepts.

The intercept parameters provide the means through which the demand and supply shocks may be identified: a change in the intercept (i.e. a shift in the curve) of (1) would constitute a 'supply shock' ($\varepsilon_i^s = \Delta\alpha^i$) and a change in the intercept of (2) a 'demand shock' ($\varepsilon_i^d = \Delta\beta^i$). The demand and supply curves, along with the shocks, can be specified in a time series model as a structural vector autoregression (SVAR):

$$A^i z_{i,t} = \sum_{j=0}^{N} A_j^i \, z_{i,t-j} + \varepsilon_{i,t} \tag{3}$$

Where $A^i = \begin{bmatrix} 1 & -\sigma^i \\ \delta^i & 1 \end{bmatrix}, z_{i,t} = \begin{bmatrix} q_i \\ p_i \end{bmatrix}$ and the structural residuals $\varepsilon_i = \begin{bmatrix} \varepsilon_i^s = \Delta\alpha^i \\ \varepsilon_i^d = \Delta\beta^i \end{bmatrix}$. The reduced form of the SVAR in (3) is given by:

$$z_{i,t} = \left[A^i\right]^{-1} \sum_{j=0}^{N} A_j^i \, z_{i,t-j} + v_{i,t} \tag{4}$$

Estimating (4) yields the reduced-form price and quantity residuals, $v_i = \begin{bmatrix} v_i^q \\ v_i^p \end{bmatrix} = \left[A^i\right]^{-1} \begin{bmatrix} \varepsilon_i^s \\ \varepsilon_i^d \end{bmatrix}$.

The signs of these reduced-form residuals reveal information about the signs of the structural shocks, ε_i, and enable the classification of shocks as being demand- or supply-driven.[6] The classification rests on the premise that supply shocks cause prices and quantities to change in opposite directions while demand shocks cause them to change in the same direction, as illustrated in Figure 1. If the reduced-form price and quantity residuals from (4) have opposite signs, the prevailing shock impacting expenditure category i in period t can be considered supply-driven. If the price and quantity residuals have the same signs, then the prevailing shock is classified as demand-driven.

Using category-level data allows us to assess the extent to which categories may be experiencing *at least* a demand or *at least* a supply shock; and therefore get a sense of the extent to which inflation for a given category may be being driven by either demand or supply. An important caveat is that this framework captures the net dominant shock. We cannot determine the size of a given shock clearly without imposing further restrictions on the slope parameters. For example, in the presence of simultaneous demand and supply shocks, since we cannot pin down the relative size of the shocks, the ultimate classification as demand or supply-driven could be more a function of the sector's demand and supply elasticities than the size of the simultaneous shocks.[7, 8] Also worth highlighting is that we can only make inferences about the basic drivers of the shocks (for example, we cannot say conclusively that a given supply shock is underpinned by an exchange rate shock or an oil price shock). As Dudson

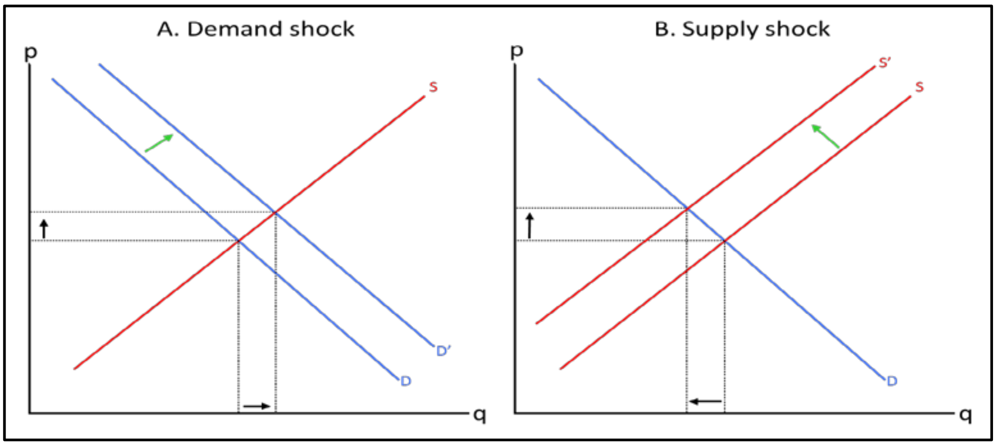
6 See Jump and Kohler (2022). The structural shocks in (3) can be recovered from the residuals in (4) using the transformation: $\varepsilon_{i,t} = A^i v_{i,t}$

7 See Shapiro (2024) for an illustration of this point.

8 At low levels of disaggregation, the possible incidence of simultaneous shocks on a given component becomes more prevalent. The ambiguity thresholds discussed in Section 5 aim to address this concern.

(2024) states, identifying the initial sources of these shocks is not the crux of the Shapiro methodology, and thus not necessarily a limitation. Using different frameworks to pin down the initial sources of the identified shocks would, however, likely be useful extensions.

Figure 1: Demand and supply shock illustrations

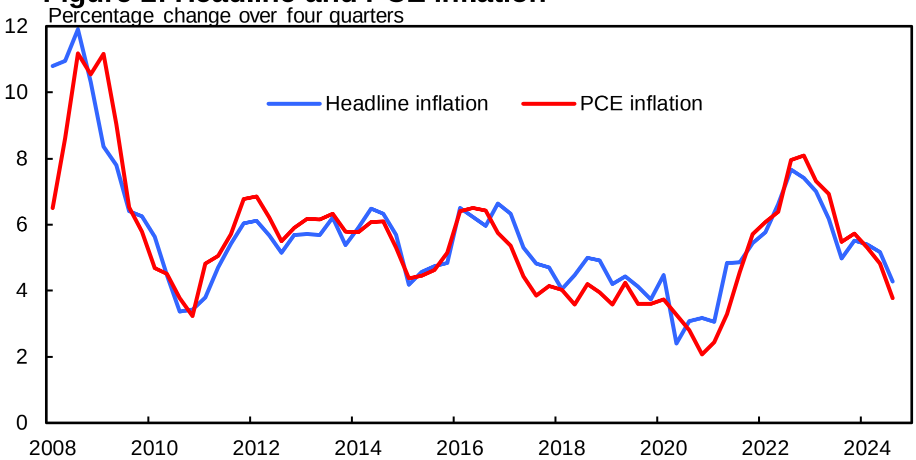


2.2 Data

As outlined in Section 2.1, data on price levels and quantities are required for this analysis. We use category-level household PCE data from the National Accounts at a quarterly frequency from the first quarter of 2000 to the third quarter of 2024 for the baseline analysis (there are 22 PCE categories; see Table A1 in the Appendix). Real consumption expenditures for the various categories constitute the quantity indices and each category's derived price deflator as the corresponding price indices. All data are seasonally adjusted.

Using PCE price and quantity indices means that final decomposition will be one of PCE inflation, not headline inflation.[9] However, as shown in Figure 2, the two series track each other closely, allowing for more general inferences from the PCE data to headline inflation.

Figure 2: Headline and PCE inflation



Source: Stats SA.

9 While possible to match PCE quantity indices with Consumer Price Indices, the differences in category levels between the two datasets makes this matching exercise cumbersome, hence our choice of both PCE quantity and price indices.

2.3 Estimation and inflation decomposition

As in Shapiro (2024) we specify the reduced-form VAR quantity and price equations as follows:

$$q_{i,t} = \sum_{j=1}^{4} \gamma_j^{qp} p_{i,t-j} + \sum_{j=1}^{4} \gamma_j^{pp} q_{i,t-j} + c_{q,i} + v_{i,t}^{q} \tag{5}$$

$$p_{i,t} = \sum_{j=1}^{4} \gamma_j^{pp} p_{i,t-j} + \sum_{j=1}^{4} \gamma_j^{pq} q_{i,t-j} + c_{p,i} + v_{i,t}^{p} \tag{6}$$

where $q_{i,t}$ and $p_{i,t}$ are the respective log quantity and log price index of PCE category i, $c_{q,i}$ and $c_{p,i}$ are constants, and $v_{i,t}^{q}$ and $v_{i,t}^{p}$ are the reduced-form residuals as defined earlier. The baseline specification uses four lags to account for trends emanating from lower frequency factors (such as technological improvements and demographics) which may influence prices and quantities, but that are unlikely to be driven by shifts in demand or supply. The reduced-form residuals are used to label shocks with the following indicator functions:[10]

$$\mathbb{1}_{i\epsilon\,\mathrm{sup}(+),t} = \begin{cases} 1 & if\ v_{i,t}^{p} < 0, v_{i,t}^{q} > 0 \\ 0 & otherwise \end{cases}$$

$$\mathbb{1}_{i\epsilon\,\mathrm{sup}(-),t} = \begin{cases} 1 & if\ v_{i,t}^{p} > 0, v_{i,t}^{q} < 0 \\ 0 & otherwise \end{cases}$$

$$\mathbb{1}_{i\epsilon\,\mathrm{dem}(+),t} = \begin{cases} 1 & if\ v_{i,t}^{p} > 0, v_{i,t}^{q} > 0 \\ 0 & otherwise \end{cases}$$

$$\mathbb{1}_{i\epsilon\,\mathrm{dem}(-),t} = \begin{cases} 1 & if\ v_{i,t}^{p} < 0, v_{i,t}^{q} < 0 \\ 0 & otherwise \end{cases}$$

By multiplying these indicators by the corresponding expenditure weights ($\omega_{i,t}$) and aggregating over all the PCE categories, we can obtain a share of the PCE basket experiencing one of the four shocks:

$$\gamma_{s,t} = \sum_{i} \mathbb{1}_{i\epsilon s,t}\, \omega_{i,t} \tag{7}$$

For the demand-supply inflation decomposition, we use similar indicator functions:

$$\mathbb{1}_{i\epsilon\mathrm{sup}\,,t} = \begin{cases} 1 & if\ v_{i,t}^{p} > 0, v_{i,t}^{q} < 0\ or\ v_{i,t}^{p} < 0, v_{i,t}^{q} > 0 \\ 0 & otherwise \end{cases}$$

$$\mathbb{1}_{i\epsilon\mathrm{dem}\,,t} = \begin{cases} 1 & if\ v_{i,t}^{p} > 0, v_{i,t}^{q} > 0\ or\ v_{i,t}^{p} < 0, v_{i,t}^{q} < 0 \\ 0 & otherwise \end{cases}$$

[10] A positive demand shock is an outward shift in the demand curve, associated with unexpected increases in price (higher inflation) and quantity (vice versa for a negative demand shock). A positive supply shock is reflected in a downward shift in the supply curve, associated with an unexpected drop in prices and an increase in quantity (vice versa for a negative shock).

Similarly to (7), multiplying the indicator by the corresponding expenditure weight and inflation rate for each PCE category ($\pi_{i,t}$) and aggregating over i, we can decompose PCE inflation (year- on-year; π_t) into its supply- and demand-driven contributions:

$$\pi_t = \underbrace{\sum_i \mathbb{1}_{i\epsilon sup,t}\omega_{i,t}\pi_{i,t}}_{supply-driven} + \underbrace{\sum_i \mathbb{1}_{i\epsilon dem,t}\omega_{i,t}\pi_{i,t}}_{demand-driven} \tag{8}$$

3. Baseline results

Figure 3 illustrates the share of the PCE basket by the type of shock experienced in a given quarter.[11] Features consistent with *a priori* expectations include increases in the negative supply shock series often coinciding with high inflation episodes in South Africa's recent history (for example, during the drought in 2015-16 and following the severe supply chain disruptions in 2021), or negative (disinflationary) demand shocks typically becoming more prevalent during downward phases of the business cycle.

Our analysis shows that the prevalence of negative (inflationary) supply shocks fell throughout 2020 (with the share of the PCE basket experiencing positive, disinflationary, supply shocks staying roughly stable) (Figure 3B). The prevalence of negative (disinflationary) demand shocks rose sharply at the pandemic onset and stayed elevated for much of 2020. (Figure 3A). This result supports earlier findings that while supply factors may still have been exerting some upward pressure on inflation early in 2020, disinflationary demand and supply shocks ultimately contributed to the low inflation environment that prevailed at the height of the pandemic.[12] The picture changed drastically from 2021 to 2022 as (inflationary) positive demand and negative supply shocks (together 61.8% of PCE) became more pervasive. Disinflation in 2023 and 2024 was aided by the reduced prevalence of positive demand shocks (the frequency of negative demand shocks has also increased sharply). Over this same period, however, the share of the PCE basket experiencing negative supply shocks remained elevated, a sign that these shocks were slow to dissipate.[13]

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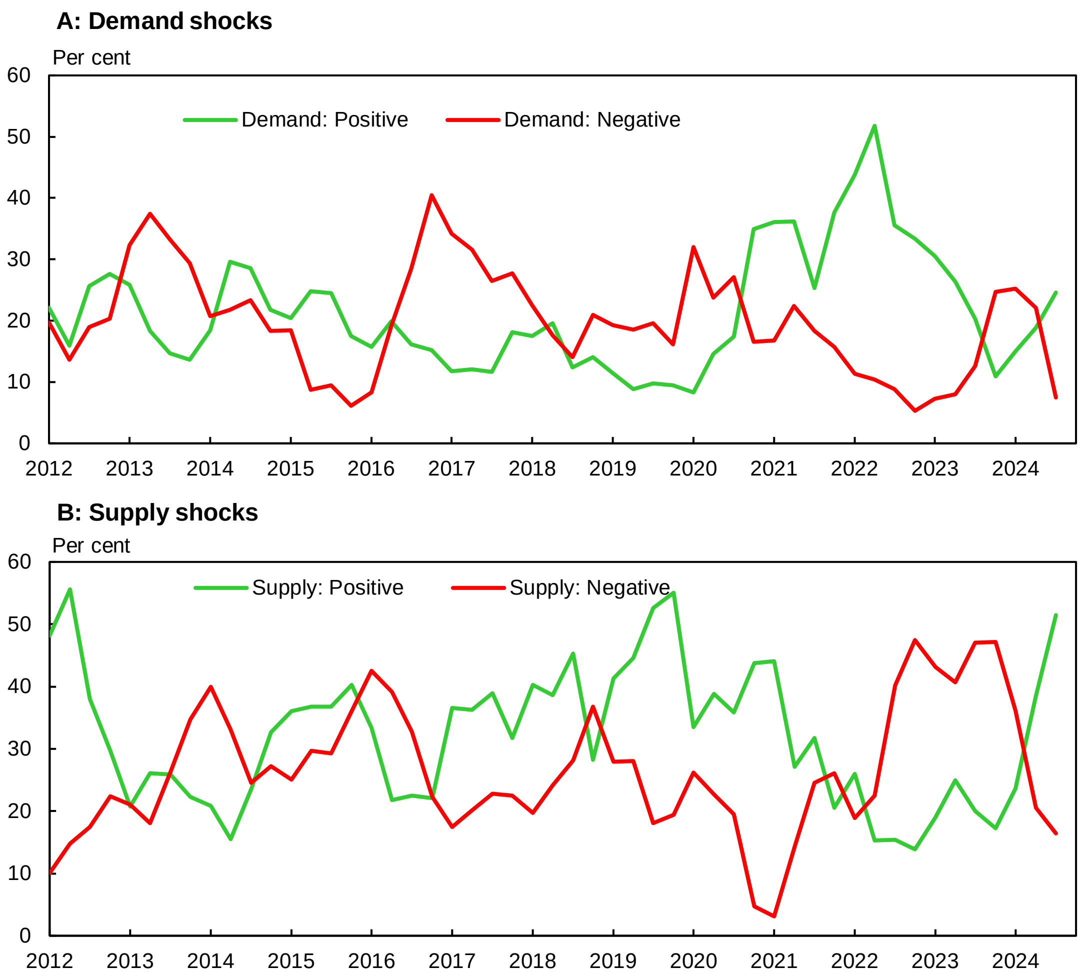
11 Unless stipulated otherwise, to smooth volatility, all data and graphs relating to the demand-supply decomposition or demand-supply shares are averaged with a three-quarter centred moving average.

12 See Botha and Steenkamp (2020).

13 Examples of PCE categories that have seen persistent negative supply shocks include, among others, exchange-rate sensitive goods like personal transport equipment and miscellaneous goods, as well as food, beverages and tobacco. Persistence among these categories points to the lingering effects of a sharp rand depreciation in 2023 and other supply constraints like load-shedding. Rentals and other housing services has also seen the somewhat persistent presence of inflationary supply shocks since around 2022. Kruger, Mondalawa and Tshenkeng (2024) note that a mild recovery in rental demand has coincided with constrained housing supply, together contributing to some upward impetus in rental inflation. Our findings support these conclusions by providing some evidence that the net dominant inflationary effect may be from housing supply-side constraints.

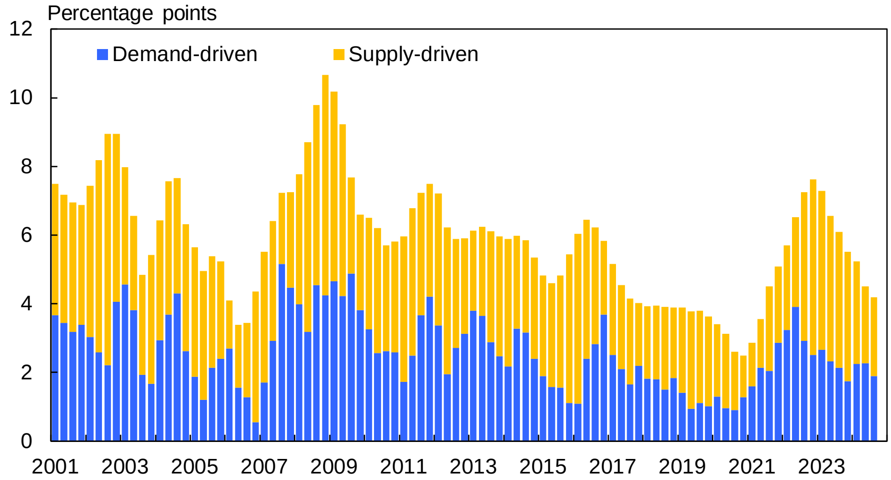
Figure 3: Share of PCE by shock*



* Three quarter centred moving average. The share of all four shocks sum to 100 per cent for any given quarter. Source: Own calculations.

Figure 4 illustrates the demand and supply-driven contributions to PCE inflation (percentage change over four quarters). As mentioned in Section 2, these contributions do not necessarily indicate the changes in the size/intensity of the demand or supply shocks but show the extent to which demand and supply factors may be driving inflation. On average, over the sample period, the contributions to inflation from the supply side have been larger than the demand side.

Figure 4: Contributions to PCE inflation*



* Percentage change over four quarters.
Source: Own calculations.

The decomposition shows that in 2020, demand-driven inflation was low, mainly due to imposed lockdown restrictions, which constrained already subdued demand even further (demand-driven inflation had been falling from around 2017).[14] As these restrictions were lifted and the economy began to reopen, along with a supportive fiscal and monetary policy landscape, demand strengthened, and demand-driven inflation increased throughout 2021, peaking in the third quarter of 2022. These findings are consistent with the evolution of the supercore inflation measure developed by the SARB, which serves as an indicator of demand pressures in the economy. The supercore inflation readings suggest that demand was relatively weak in 2020 but started to improve from 2021 onward (Figure 5).[15]

Supply-driven inflation generally eased throughout 2020 but increased in 2021 amid severe global supply-chain disruptions. From the second half of 2022, significant supply-side pressures emerged, driven by high food and energy prices triggered by the Russia-Ukraine war and subsequently various domestic idiosyncrasies.[16] Both supply and demand factors contributed materially to the inflation surge in 2021-22, with supply factors seemingly having played a more prominent role in keeping inflation above target after 2022.

What are the implications for monetary policy of the finding that supply-side factors have been prominent drivers of domestic inflation? Conventional wisdom posits that central banks should 'see through' *temporary* supply shocks. This may not, however, necessarily be the best of course of action when supply shocks prove persistent, result in second-round effects and contribute to the de-anchoring of inflation expectations (as has been true in South Africa).[17] Literature suggests that monetary policy should intervene in such instances to return inflation

14 Demand-driven contributions fell from around 3.7 percentage points in 2017 to around 0.7 percentage points in 2020.

15 The supercore basket consists of components of the core inflation basket that are sensitive to business cycle fluctuations; see de Kock et al. (2024).

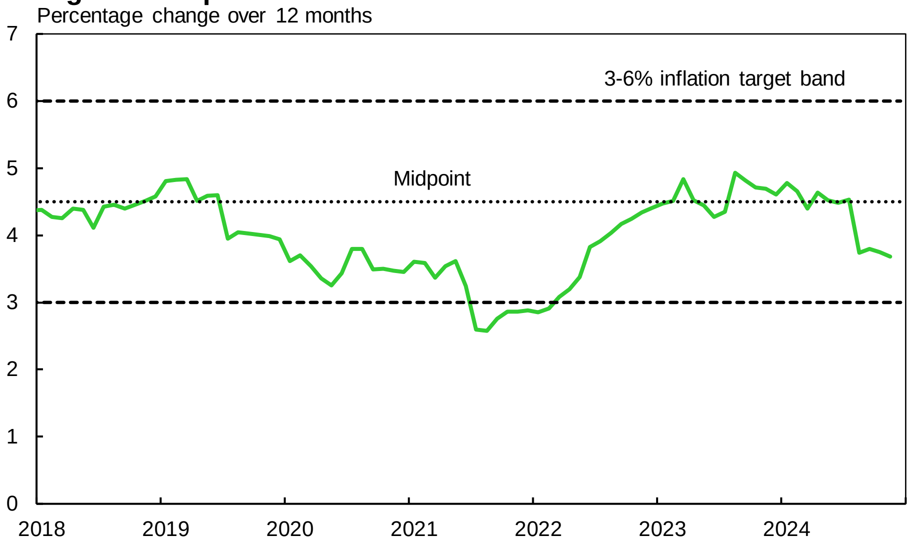
16 For example, load-shedding, sharp currency depreciation and logistical constraints.

17 See Amaral, Kruger and Reid (2023).

to target by ensuring that these shocks dissipate more quickly, through keeping expectations anchored and limiting second-round effects.[18]

South Africa's disinflation can be attributed to unwinding supply constraints, softening demand pressures on the back of moderately restrictive monetary policy, and, only very recently, the greater prevalence of positive supply shocks. While both demand- and supply-driven inflation have fallen from their 2022 highs, our analysis shows that supply drivers of inflation unwound slower initially. Lingering effects of past supply shocks likely contributed to inflation remaining sticky above the 4.5% target midpoint for longer, especially in the first half of 2024, with inflation only dipping below the target midpoint in August.[19]

Figure 5: Supercore inflation



Sources: Stats SA and SARB.

4. Analysis extensions

A downside to the PCE data is that it is released quarterly and with a significant lag that can result in the insights from the above analysis being outdated. One solution is to apply this methodology and inflation decomposition to South African retail trade data. This data's monthly frequency allows for more timeous and higher frequency analysis relative to the quarterly PCE data but comes at the cost of fewer categories (Table A2) and a more limited use-case.[20] This latter point is evident from Figure 6: while the retail trade deflator tracks headline inflation to some extent, it tracks better with core goods inflation.[21] Though this analysis extension has a very specific use-case (i.e. being a possible gauge of core goods inflation drivers), the insights we obtain are useful, nonetheless.

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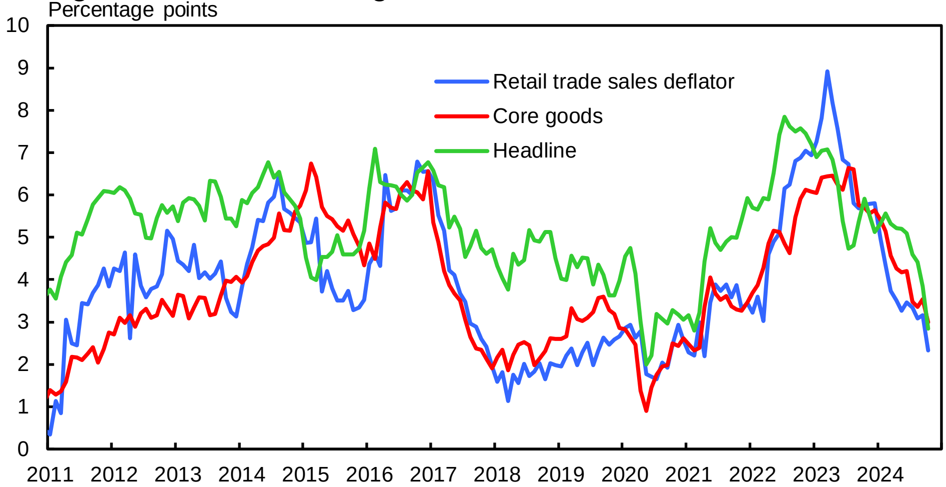
[18] See, for example, Orphanides and Williams (2007) Bandera et al. (2023) and Amatyakul et al. (2023).

[19] This finding supports separate research on inflation persistence in South Africa that also shows supply shock persistence as having kept underlying inflation elevated. See Amaral et al. (2024).

[20] Given the monthly frequency of the retail trade sales data, the reduced-form VAR in Equations 5 and 6 are instead estimated with 12 lags.

[21] The correlation coefficient between retail sales and headline inflation is 0.81, while between retail sales and core goods inflation is 0.89. A reason for this closer co-movement with core goods is because the impact of fuel prices is absent in the retail trade data (it is accounted for in the motor trade sales data).

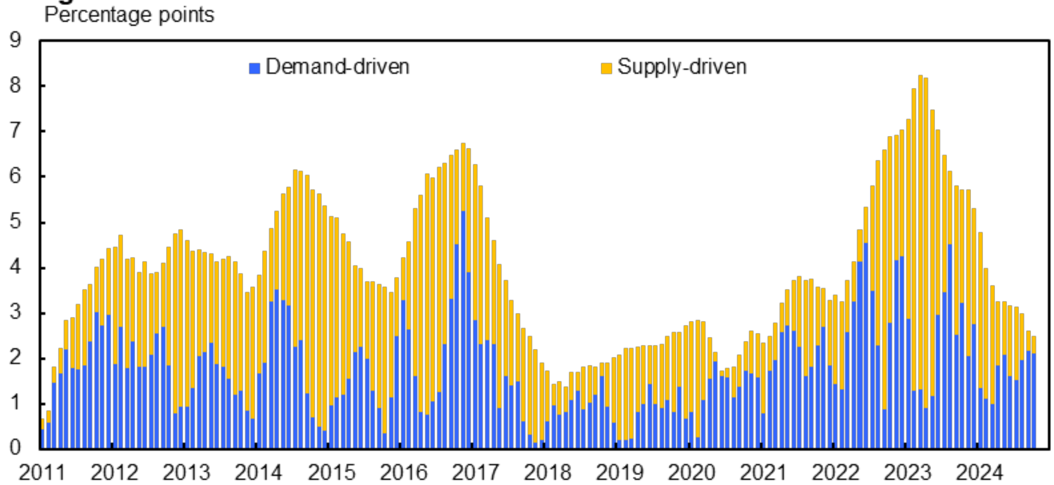
Figure 6: Headline, core goods and retail trade sales deflator inflation



Sources: Stats SA and SARB.

The decomposition of the retail trade deflator in Figure 7 shows that demand and supply drivers were relatively balanced at the onset of the COVID-19 pandemic. However, as shown in Section 3, demand pressures rose as the economy reopened. Unsurprisingly with goods inflation, from 2022 onwards, supply-side drivers grew in prominence and became the dominant drivers of inflation amid sharply higher commodity prices, a more depreciated currency and other idiosyncrasies, like load-shedding and logistical disruptions.[22]

Figure 7: Contributions to retail trade sales deflator inflation*



* year-on-year percentage; 3-month centered moving average
Source: Own calculations

5. Robustness checks

In this section, we evaluate the robustness of our baseline results against alternative, more stringent model specifications. The first set of checks addresses concerns around potential

[22] Interestingly, Figure 7 also shows demand-driven pressures spiking in 2023, at the same time as when supply drivers were the strongest. A possible explanation for this is substitution from the categories experiencing supply shocks, resulting in an uptick in demand in other categories. See, for example, Beckers (2023) and Ellis (2024).

model misspecification in equations (5) and (6). The baseline specification may not adequately control for the mentioned lower-frequency factors, which could result in the mislabelling of the shocks. The second set imposes stricter conditions on the shock labelling precision with residuals not statistically significantly different from zero labelled as 'ambiguous'. Graphs of the contributions to PCE inflation stemming from these alternative specifications are shown in the Appendix, while Tables 1 and 2 show the correlations between the baseline supply and demand series and the respective series from these alternative specifications.[23]

One source of misspecification can be due to an incorrect lag length structure. Accordingly, we also considered two, six and eight lags, but these do not change the results substantially (Figures A1, A2 and A3). Misspecification could also result from not expressly controlling for deterministic trends in the data. Adding a linear deterministic trend variable to equations (5) and (6) does not change the overall trend in the contributions relative to the baseline, although the post-COVID demand contribution does peak slightly higher (Figure A4). Finally, we also estimate the VAR in (5) and (6) in first differences.[24] These results also do not differ substantially from the baseline (Figure A5), with some similarities with the model specification containing a linear deterministic trend.

The second set of robustness exercises relates to the 'strictness' with which the shocks are labelled. There is the risk of imprecisely labelling a shock when the reduced-form residuals are only marginally positive or negative. Accordingly, we redefine the reduced-form residuals and classify residuals falling within τ standard deviations of the mean (which is zero) as being insignificant:[25]

$$v_{i,t}^{p} = \begin{cases} v_{i,t}^{p} & if\ v_{i,t}^{p} \leq -\tau\sigma_{v_i^p}\ or\ v_{i,t}^{p} \geq \tau\sigma_{v_i^p} \\ 0 & if\ -\tau\sigma_{v_i^p} < v_{i,t}^{p} < \tau\sigma_{v_i^p} \end{cases}$$

$$v_{i,t}^{q} = \begin{cases} v_{i,t}^{q} & if\ v_{i,t}^{q} \leq -\tau\sigma_{v_i^q}\ or\ v_{i,t}^{q} \geq \tau\sigma_{v_i^q} \\ 0 & if\ -\tau\sigma_{v_i^q} < v_{i,t}^{q} < \tau\sigma_{v_i^q} \end{cases}$$

where $\sigma_{v_i^p}$ and $\sigma_{v_i^q}$ are the standard deviations of the respective price and quantity reduced-form residuals. We then use these redefined residuals to relabel the shocks, creating an 'ambiguous' label for those shocks that were neither precisely definable as demand nor supply shocks:

$$\mathbb{1}_{i\epsilon \mathrm{amb},t} = \begin{cases} 1 & if\ v_{i,t}^{p} = 0\ or\ v_{i,t}^{q} = 0 \\ 0 & otherwise \end{cases}$$

23 If the baseline results are robust, there would be a high correlation between the baseline demand and supply series and the demand and supply series from the alternative model specifications discussed in the text.

24 This specification is similar to the baseline model in Firat and Hao (2023). Running the model in first differences, however, changes the definition of the reduced-form residuals used in the classification, departing from the theoretical underpinnings proposed by Shapiro (2024). In this specification, the residuals would indicate a shock increase/decrease to the rate of change of prices (i.e. inflation) and quantities.

25 See Shapiro (2024) and Dudson (2024).

For the robustness exercise, we show results from two stringency thresholds, namely $\tau = 0.10$ and $\tau = 0.15$.[26] Once again, our baseline results prove to be robust. (Figures A6 and A7). Interestingly, with the stricter threshold, $\tau = 0.15$, during the post-COVID inflation surge, possible mislabelling seems to have affected categories initially labelled as supply-driven in the baseline results (that is, it appears that demand-driven categories were more precisely labelled, even in the baseline results).

Table 1: Cross correlations of baseline supply-driven measure and alternative specifications

Supply-driven	Baseline	AR2	AR6	AR8	Linear trend	First diff	$\tau = 0.10$	$\tau = 0.15$
Baseline	1.000							
AR2 ('2 lags')	0.930	1.000						
AR6 ('6 lags')	0.897	0.887	1.000					
AR8 ('8 lags')	0.856	0.836	0.865	1.000				
Linear trend	0.767	0.790	0.746	0.695	1.000			
First diff	0.804	0.837	0.824	0.733	0.822	1.000		
$\tau = 0.10$	0.917	0.895	0.859	0.809	0.705	0.766	1.000	
$\tau = 0.15$	0.882	0.888	0.873	0.811	0.687	0.776	0.947	1.000

Source: Own calculations.

Table 2: Cross correlations of baseline demand-driven measure and alternative specifications

Demand-driven	Baseline	AR2	AR6	AR8	Linear trend	First diff	$\tau = 0.10$	$\tau = 0.15$
Baseline	1.000							
AR2 ('2 lags')	0.885	1.000						
AR6 ('6 lags')	0.900	0.837	1.000					
AR8 ('8 lags')	0.853	0.756	0.879	1.000				
Linear trend	0.786	0.708	0.796	0.750	1.000			
First diff	0.695	0.665	0.754	0.611	0.749	1.000		
$\tau = 0.10$	0.883	0.816	0.887	0.801	0.753	0.749	1.000	
$\tau = 0.15$	0.838	0.770	0.879	0.784	0.726	0.740	0.958	1.000

Source: Own calculations.

6. Conclusion

In this *Note* we decompose South Africa's PCE inflation into its demand and supply drivers using the methodology of Shapiro (2024). Our results suggest that the post-COVID inflation surge was initially driven by pent-up demand and later spurred by supply-side factors. The disinflation path since mid-2022 has been supported by a combination of the reduced prevalence of both demand and supply pressures, however, the latter faded slowly, helping to explain the inflation stickiness experienced in the first half of 2024.

The work undertaken in this *Note* allows us to track demand- and supply-driven pressures across time and can serve to inform inflation dynamics. This feature also sets the foundation for possible future research on various topics, such as assessing monetary policy transmission or the inflationary impacts of South African idiosyncrasies like load-shedding and logistical constraints.

[26] While we show the results for the 0.10 and 0.15, we do test different thresholds in the range of 0.025 to 0.25 with the results generally robust to varying the threshold.

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8. Appendix

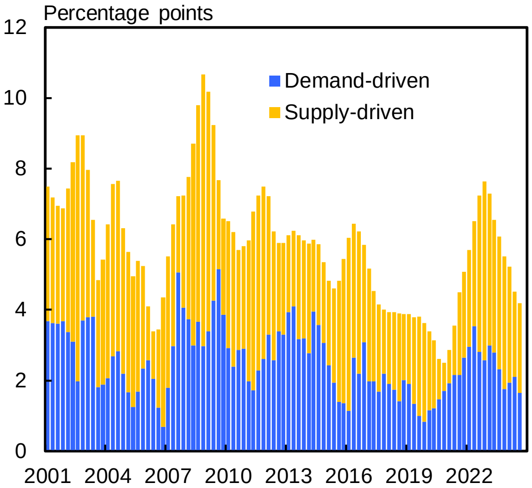
Table A1: Final household PCE categories and expenditure weights

Household PCE category	Weight in PCE*
Furniture, household appliances, etc	1.98
Personal transport equipment	4.47
Computers and related equipment	0.41
Durable goods: Recreational and entertainment goods	2.22
Other durable goods	0.82
Clothing and footwear	5.06
Household textiles, furnishings, glassware etc	1.31
Motorcar tyres, parts and accessories	1.55
Semi-durable goods: Recreational and entertainment goods	0.59
Miscellaneous goods	0.46
Food, beverages and tobacco	18.52
Household fuel, power and water	4.14
Household consumer goods	2.09
Medical and pharmaceutical products	1.96
Petroleum products	2.76
Non-durable goods: Recreational and entertainment goods	0.80
Rent and other housing services	11.05
Household services	2.32
Medical services	5.16
Transport and communication services	11.16
Recreational, entertainment and educational services	7.47
Miscellaneous services	13.71
*Average weight in PCE from 2011Q1 to 2024Q3	**100.00**

Table A2: Retail Trade categories and weights

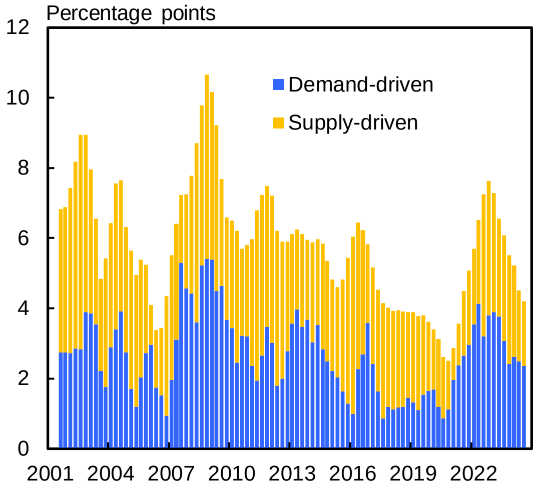
Retail trade categories	Weight*
General dealers	45.25
Food, beverages and tobacco in specialised stores	8.38
Pharmaceutical and medical goods, cosmetics and toiletries	7.21
Textiles, clothing, footwear and leather goods	14.17
Household furniture, appliance and equipment	3.79
Hardware, paint and glass	8.88
All other retailers	12.32
* Average weight from Jan 2008 to Oct 2024	**100.00**

Figure A1: Contributions to PCE inflation (2 lags)*



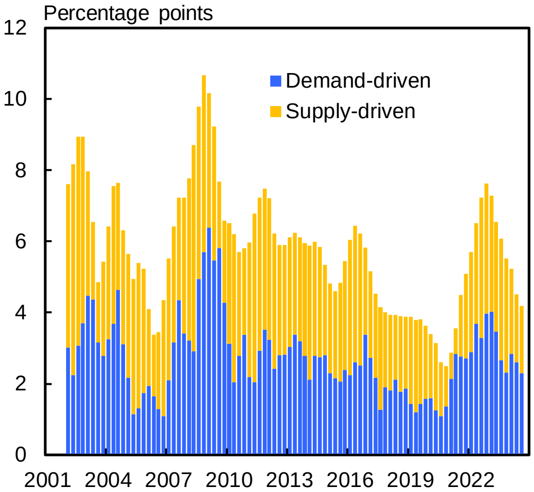
* Percentage change over four quarters
Source: Own calculations

Figure A2: Contributions to PCE inflation (6 lags)*



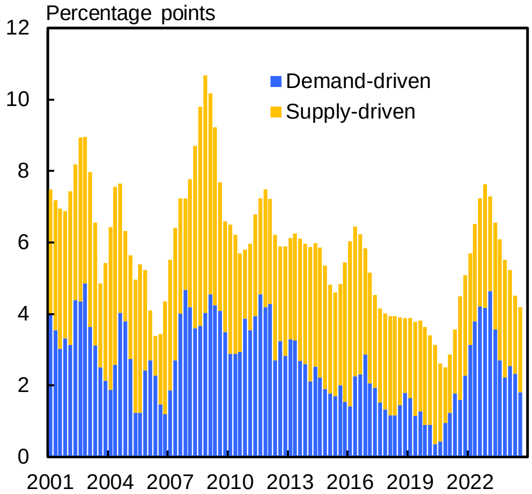
* Percentage change over four quarters
Source: Own calculations

Figure A3: Contributions to PCE inflation (8 lags)*



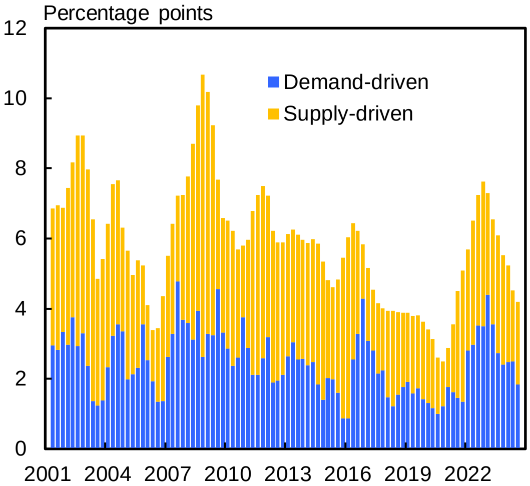
* Percentage change over four quarters
Source: Own calculations

Figure A4: Contributions to PCE inflation (linear deterministic trend)*



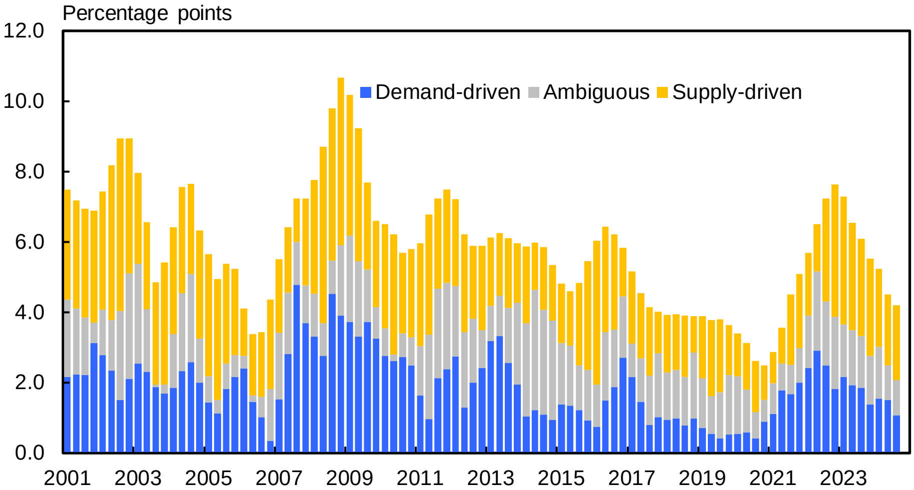
* Percentage change over four quarters
Source: Own calculations

Figure A5: Contributions to PCE inflation (first differences)*



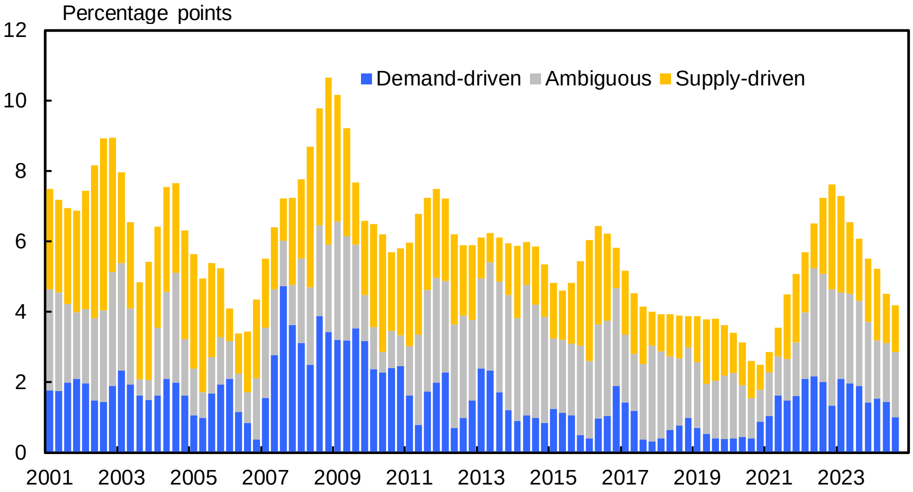
* Percentage change over four quarters
Source: Own calculations

Figure A6: Contributions to PCE inflation ($\tau = 0.10$)*



* Percentage change over four quarters
Source: Own calculations

Figure A7: Contributions to PCE inflation ($\tau = 0.15$)*



* Percentage change over four quarters

Source: Own calculations