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Looking to the price setters: what can we learn from firm-level inflation expectations data?

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Abstract

This note gives an overview of the Bureau for Economic Research's business sector inflation expectations data in South Africa, including additional firm-level dimensions and characteristics, and provides motivation for prioritising the analysis of this data. We show how the disaggregated data can provide valuable insights for policymakers about how well "anchored" inflation expectations are and the extent to which inflationary pressures filter through the economy and become more generalised. Our illustrative analysis of the disaggregated firm-level data in recent post-COVID years (2021-2023) suggests that second-round effects may have arisen, with evidence that inflation expectations may have become moderately unanchored along with underlying inflationary pressures that have broadened.

1. Introduction

Central bank credibility and the management of inflation expectations are central to an inflation-targeting regime, so, unsurprisingly, central banks monitor inflation expectations closely. Researchers initially tended to rely relatively heavily on inflation expectations extracted from asset price data. The benefits of asset price measures of inflation expectations are that the data is of high quality and available at a high frequency, even enabling intra-day studies of the responses of the financial markets to new information. Asset prices also reflect actual behaviour rather than opinions (as captured by survey data).

The widespread adoption of greater transparency by central banks globally since the 1990s, labelled the 'Quiet Revolution' by Alan Blinder,[1] has seen an increased focus on central bank communication with the public rather than financial markets. This 'second wave' of the Quiet Revolution[2] was motivated by findings that there are notable differences between the inflation expectations of different groups in society and that these differences are of economic significance.[3] The expectations of groups other than financial market participants are collected via surveys, raising interest in survey data.

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[1]   AS Blinder, (2004).
[2]   A Haldane, A Macaulay and M McMahon, (2020).
[3]   O Coibion, and Y Gorodnichenko, (2015).
     C Binder, (2017).

With the adoption of inflation targeting in South Africa in 2000, the South African Reserve Bank (SARB) commissioned the Bureau for Economic Research (BER) to conduct inflation expectations surveys for four groups in society – financial analysts, the business sector, trade unions and households. While many countries have been collecting survey data about inflation expectations for an extended period, there has been a lack of consistency across countries regarding how these surveys are designed and targeted.

Globally, the groups most typically surveyed are financial professionals and households.[4] More recently, there has been increasing recognition that the inflation expectations of businesses may be more relevant due to their disproportional influence on prices, but surveys of this group remain rare internationally. We are therefore privileged to have, in South Africa, a rich survey of business sector inflation expectations for a period of over two decades.[5] The value of this data has yet to be fully exploited. The data is often still used in aggregate form, where the forecasts of the financial analysts and trade unions are presented together with those of the business sector. Little to no attention is paid to the heterogeneity within the data, which could provide insight into the price-setting behaviour contributing to inflation.

The aim of this note is threefold. Firstly, we explain the relevance of business sector inflation expectations and why they may warrant particular attention. We then describe the data, including the additional dimensions of firm classification collected in the survey (most notably the sector of each respondent firm). Finally, we use the disaggregated data to illustrate how it can provide insights into underlying inflationary dynamics in the South African economy beyond what simply looking at a sample average can provide. Specifically, we first look at the dispersion of the individual survey response data to determine whether expectations are anchored or whether there are signs that they are drifting. We then exploit the sectoral categorisation to shed light on the extent to which inflationary shocks are permeating through the system (becoming more 'broad-based' or 'generalised').

This detail is not just a matter of academic interest – the idea that inflationary pressure had become 'broad-based' was one of the central justifications that the Federal Reserve Bank used in March 2022 to justify its decision to start its aggressive rate hiking cycle. In a world where a central bank experiences numerous economic shocks, the distinction between 'temporary pressures' and 'broad-based'[6] (or 'embedded') inflation is vital to determining appropriate monetary policy actions.

2. Honing in on the price setters: Why focus on the business sector inflation expectations?

The results of the business inflation expectations survey are reported by the BER alongside the outcomes of the financial analyst and union representative surveys. The surveys of each group have slightly different characteristics that researchers should be mindful of when analysing the data.

[4]   M Weber, F D' Acunto, Y Gorodnichenko and O Coibion, (2022).
[5]   M Reid and P Siklos, (2021).
[6]   J Cox, (2022).

The size of the financial analyst and trade union samples tends to be small. Across the four quarters of 2022, the BER collected 68 unique responses for analysts and 48 for unions, contrasting with the more than 600 received for businesses. Regarding the trade union survey, there is also concern that the person answering that survey may not always be in a crucial decision-making position, which might mean that the opinions of this set of price setters are not as precisely measured.[7]

There are also economic reasons for honing in on the price setters. Figure 1 shows that analysts' medium-term inflation expectations tend to be stable and anchored around the SARB's preferred midpoint of the inflation target range. This feature is likely attributable to their forecasting models having the midpoint as a built-in anchor point and their proximity to and familiarity with the central bank's monetary policy stance – both of which standard businesses may be less likely to possess.

Figure 1: Medium-term analyst inflation expectations

Source: BER
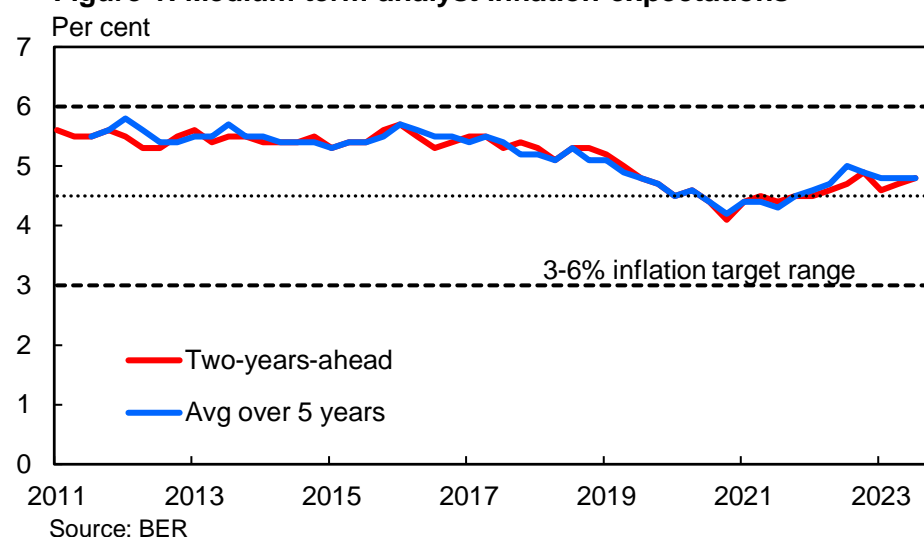
Local and international evidence shows that differences in the forecasts of the groups surveyed (analysts, firms and unions) can be notable[8,9]. As such, increasingly, academics have been recognising that the expectations of financial professionals (whether analysts or professional forecasters) may not adequately capture price-setting behaviour in an economy.

These differences across the survey groups may have a material impact on how we model and reason about concepts such as the Phillips curve (i.e., this distinction may be economically important).[10] The distinction affects how we think about inflation dynamics and how central banks should design their communication efforts. This does not mean that any of the survey groups should be disregarded. However, it supports the view that considering more

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[7]   M Reid and P Siklos, (2021).
[8]   N Crowther-Ehlers, (2019).
[9]   Understanding the behaviour that underlies these differences in inflation forecasts across groups is the subject of extensive ongoing research internationally. While information asymmetries across groups is usually put forward as a catch-all explanation for these differences, this simplicity belies our lack of certainty about the mechanisms driving these asymmetries. Theories proposed to explain differences include differences in specialised knowledge (or ability), lags in access to the true information (sticky information) and reliance on different information sets (subjective expectations).
[10]   O Coibion and Y Gorodnichenko, (2015).

carefully how we apply and interpret the components of the aggregate inflation expectations survey number could provide valuable insights. In this note, we focus on the value of the business sector component of the survey.

Accordingly, given their role as price-setters and, consequently, their disproportionate role in driving inflation dynamics, there has been a shift internationally towards seeking more detailed information on firm-level inflation expectations. Such data remains, however, surprisingly limited. In 2007, Bernanke stated, 'Information on the price expectations of businesses--who are, after all, the price setters in the first instance--as well as information on nominal wage expectations is particularly scarce'.[11] There has been notable effort to fill this gap recently, but it will take time.

In South Africa, we are fortunate to have such a firm-level survey over 20 years old. There has been some South African research exploiting the firm-level data[12], but far more is warranted.

3.   All about the business: Unpacking the richness of the BER business sector inflation expectations data

The BER has been collecting quarterly inflation expectations survey data from businesses across South Africa since the SARB first commissioned it in the third quarter of 2000. Besides the notable length of the time series, the dataset is rich. In addition to respondents' inflation expectations at various horizons,[13] the BER also collects data on respondents' expectations of economic growth, the prime rate, the rand/dollar exchange rate and wage growth. Furthermore, a range of respondent and firm-level characteristics are also recorded (Figure 2), allowing researchers to consider how forecasts might differ across respondent characteristics.

Figure 2: Business sector inflation expectations data characteristics

Sector	Firm size	Number of full-time employees	Respondent postion
• Agri. & Forestry • Construction • Manufacturing • Mining • Motor Trade • Other • Retail Trade • Services • T & OPU* • W/sale Trade	• Micro • Small • Medium • Large	• Min: <21 • Max: 1001+	• CEO/ Manager or Owner • Financial manager or accountant • Senior sales or production manager • Other

* Transport and Other Public Utilities.
Source: BER.

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[11]   BS Bernanke, (2007).
[12]   We do not provide detail of this literature here due to space constraints.
[13]   Current year, one-year-ahead, two-years-ahead and, since the third quarter of 2011, expected inflation over the next five years; these are calendar year horizons, rather than fixed-year horizons.

One characteristic of the survey that could be improved upon is the extent to which the sample is representative of the structure of the South African economy. The BER has used convenience sampling and aimed to ensure adequate representation of the various sectors (Table 1) in the business survey. [14, 15] This technique results in a relatively broad sample, where a reasonable amount of information is collected from each sector, but it does not necessarily ensure that the sample structure represents that of the population.[16] Efforts are currently underway within the SARB to offer a way to re-weight the survey in a way that is broadly representative of the South African economy.

Table 1: Sample proportion by sector with Gross Value Added (GVA) sectoral weights
Per cent

% of GVA	BER categorisation	2000	2005	2010	2015	2020	2021	2022	2023*
Agri. (3.0%)	*Agri. & Forestry*	6.1	7.0	7.5	9.2	10.8	10.5	8.6	9.0
Construction (3.0%)	*Construction*	2.2	2.4	6.0	6.2	6.8	6.8	6.5	4.0
Manufacturing (13.1%)	*Manufacturing*	40.3	42.1	33.8	30.5	31.7	30.0	30.5	35.3
Mining (5.2%)	*Mining*	0.9	2.1	1.9	2.5	1.9	2.7	2.7	0.7
Trade (13.2%)	*Retail Trade*	0.0	0.0	0.0	0.0	13.4	10.3	9.5	7.6
	Wholesale Trade	30.1	27.7	28.7	23.7	7.0	10.1	16.8	17.3
	Motor Trade	0.9	1.2	2.4	2.5	2.1	2.9	2.3	3.3
Community and social services (includes personal services; 26.2%)	*Services*	17.7	15.3	14.1	21.5	22.8	17.0	16.2	16.4
Transport and electricity (11.4%)	*T & OPU***	1.7	0.9	2.3	1.8	1.6	1.6	2.1	3.1
	Other	0.1	1.3	3.2	2.2	1.9	8.0	4.5	3.3
	Unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
	Total	100	100	100	100	100	100	100	100

* 2023 up to Q3.
** Transport and Other Public Utilities.
Source: BER and Stats SA.

Another challenge is that overall survey response rates have been declining for some time, as shown in Figure 3, a problem exacerbated by the COVID-19 pandemic[17] and not unique to

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14   A sampling technique in which survey respondents are selected based on accessibility and availability to the surveyor.
15   See Table A1 for a similar break-down according to firm size.
16   For a more detailed discussion of the strengths and weaknesses of the survey design, please see Reid & Siklos, (2021).
17   Despite the decline in recent years, the sample size of the business sector survey remains the larger than those of the financial analysts or trade unions.

South Africa. In 2022, the BER took steps to increase the sample size, recruiting new participants to replace those who had not responded in three years.[18] [19]

Figure 3: Business survey sample sizes across time

Number

* 2023 up to Q3
Source: BER
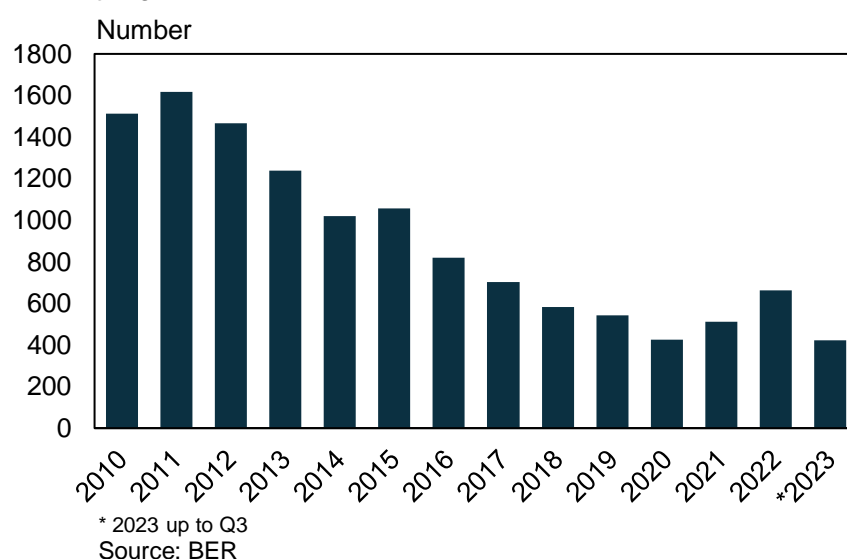
Despite these survey-related challenges, the richness of the South African business sector dataset enables us to use the disaggregated data to gain deeper insight into the opinions of the business sector and potentially the price-setting behaviour that will flow from this.

4.   Degree of anchoring: an illustration of what the disaggregated business sector data can show us

In this section, we illustrate how this firm-level dataset can be used to gauge the extent to which inflation expectations are anchored and give potential insights into the prevalence of second-round effects.

South Africa was not spared the post-COVID inflation surge in 2022, causing both short- and long-term expectations to climb and resulted in average business two-years-ahead expectations breaching the upper bound of the SARB's 3-6% inflation target range in the first quarter of 2023 (Figure 4). Naturally, this sharp rise has sparked debate around the anchoring of expectations.

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18   BER (2022).
19   The decreasing response rate also supports the need to offer sample weights to ensure the sample is representative of the structure of the South African economy.

Figure 4: Business inflation expectations

Source: BER
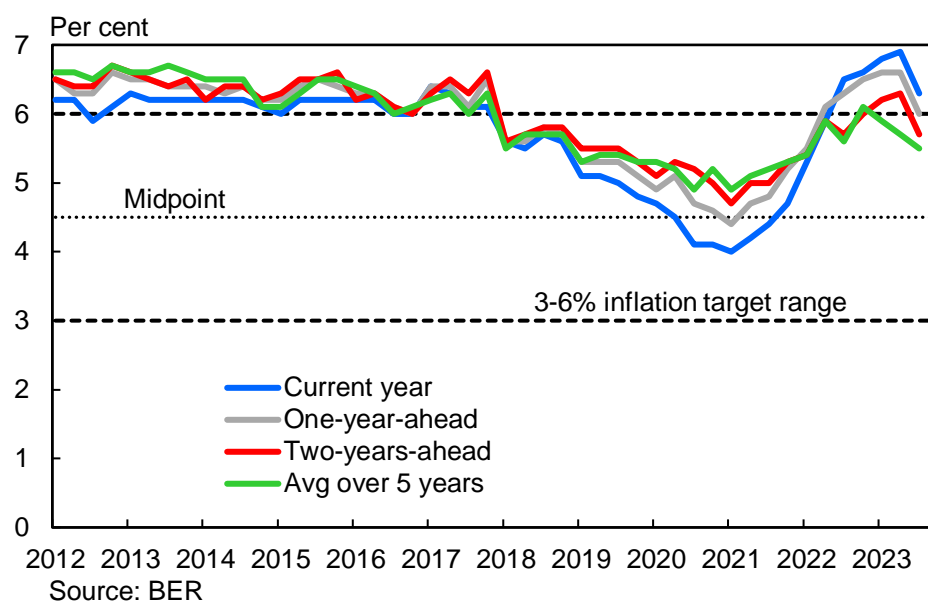
The notion that inflation expectations are "anchored" is a concept that is broadly understood to mean that expectations are close to what the central bank wishes them to be – typically some official target. However, this apparent clarity is swiftly lost when we consider how to measure the extent to which expectations are anchored. A range of different measures have been used to capture the concept. Kumar et al. (2015) review the range of measures used to capture various features of well-anchored expectations. For example, they label expectations 'ideally anchored' if inflation beliefs are close to the central bank target on average and 'strongly anchored' if the dispersion of survey responses is low around a point of central tendency.[20],[21]
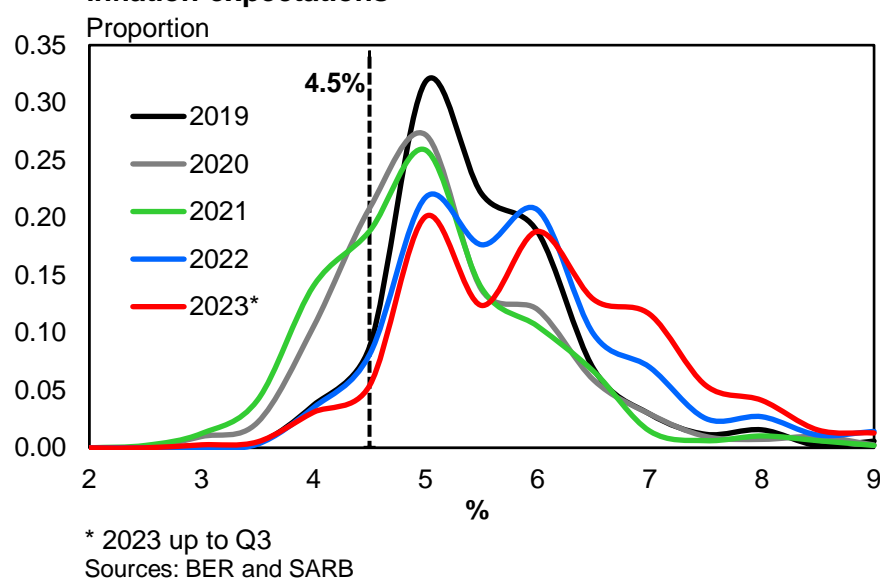
The distribution of inflation expectations shows the dispersion and skewness of survey responses. It sheds light on the stability of the inflation expectations anchor, with greater dispersion indicating that a subset of the survey respondents is less anchored than others (sometimes interpreted as reflecting a degree of uncertainty within the group). If this level of dispersion were to increase over time, this would also perhaps be evidence of decreasing certainty, trust, and, ultimately, anchoring. The literature shows that increased dispersion and changes in the skewness of the distributions often precede sustained deviations from such a central tendency point.[22] Thus, analysing the shape of the distributions can give early indications on whether the expectations anchor may be drifting or becoming less stable.

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[20]   S Kumar, H Afrouzi, O Coibion and Y Gorodnichenko, (2015).
[21]   *Ideally* this central point would be the central bank target, but not necessarily, and could correspond to a long-term mean or median.
[22]   R Reis, (2022).

Figure 5: Distribution of two-years-ahead business inflation expectations

* 2023 up to Q3
Sources: BER and SARB

The BER data (Figure 5) reveals that, in addition to the fact that the means of the distributions have shifted in line with actual inflation outcomes, the dispersion of the two-years-ahead inflation expectations distribution has increased since 2019.[23,24] In addition, the 2022 distribution is bimodal, with a fatter right tail indicating that a larger share of business respondents expected inflation above 6%.[25] Concerningly, 2023 shows a similar picture. Looking more closely at 2022 and 2023, Figure 6 reveals that respondents revised their expectations higher as 2022 progressed, with an increasing share of them anticipating inflation to remain above the upper target limit over the medium term. This analysis suggests that the expectations of parts of the business population may have become moderately unanchored, showing some signs of drifting.

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[23]   Mean (median) expectations for 2019, 2020, 2021, 2022 and 2023 respectively: 5.4 (5.2), 5.1 (5.0), 5.0 (5.0), 5.8 (5.5) and 6.0 (6.0).

[24]   The standard deviation of each distribution is a measure of the spread (the higher the number, the higher the spread): 2yr ahead: 0.97, 1.17, 1.10, 1.56 and 1.33 for 2019, 2020, 2021, 2022 and 2023 respectively.

[25]   Distribution sample sizes for 2019, 2020, 2021, 2022 and 2023 (23Q1 to 23Q3), respectively 512, 408, 483, 629 and 388. Note: the samples used to construct the distributions may differ slightly from the total sample sizes in Figure 2 as some respondents did not record responses for two-years-ahead inflation expectations.

Figure 6: Business survey: distribution of 2yr-ahead inflation expectations throughout 2022 & 2023

Percentage

Sources: BER and SARB
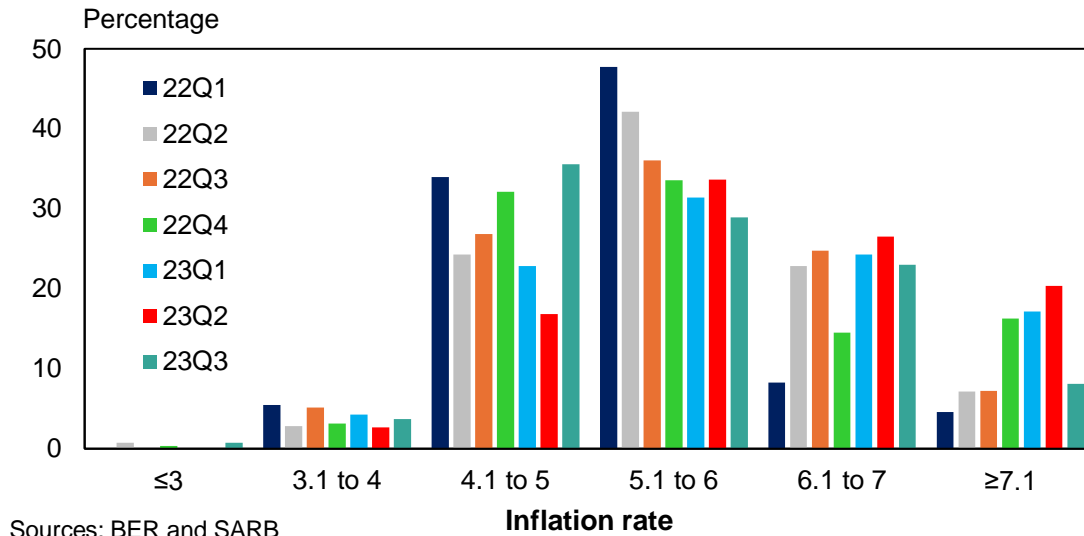
The availability of sectoral information about the survey respondents also allows us to ask questions about underlying inflation. The data can show how inflationary pressures filter through the broader economic system and whether they ultimately become more generalised – so-called "second-round effects". Intuitively, sectors experiencing a direct inflationary shock are more likely to revise their inflation expectations upwards immediately following the shock than sectors not directly exposed to the shock. If sectors seemingly isolated from the initial shock subsequently raise their expectations, it points to broadening inflationary pressures and possible second-round effects.

Figure 7: Changes* in two-years-ahead inflation expectations

Basis points

*Q4 mean minus Q1 mean
Sources: BER and SARB
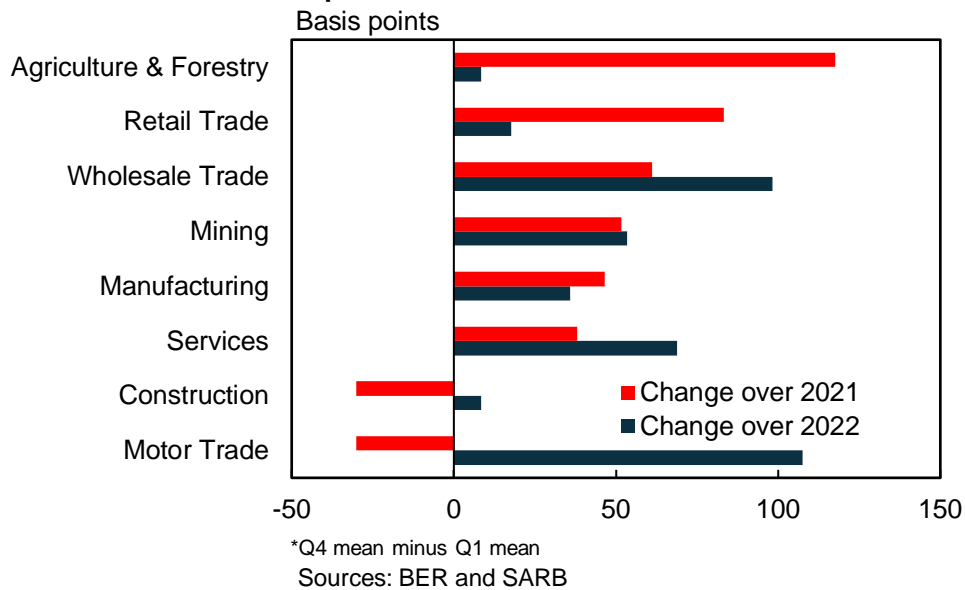
As shown in Figure 7, sectors that raised their expectations considerably in 2021, such as agriculture and retail, were likely those most directly affected by initial post-COVID supply

shocks. Such supply shocks included increasing fertiliser prices amid rising geopolitical tensions and supply chain constraints affecting retailers. These sectors either reduced the pace of upward revisions or kept the pace relatively constant the following year (2022). Sectors less likely to have been directly impacted by the supply shocks, like the services sector, saw smaller changes to expectations in 2021 but much larger adjustments in 2022. This finding provides further suggestive evidence that there has been reason to be concerned about spillovers and second-round effects.[26]

5. Conclusion

Inflation expectations contain important information for inflation-targeting central banks. After nearly 25 years, the BER continues to run the expectations survey of financial analysts, trade unions and the business sector. The business sector survey, in particular, is a precious resource, given its potential to capture price pressures from key economic decision-makers. The data gives more profound insights into underlying inflation dynamics by showing whether relatively temporary responses to supply-side inflationary shocks may be evolving into more entrenched responses that risk spreading to a broader portion of economic decision-makers. These insights are crucial in helping to determine the appropriate response of monetary policy to such shocks.

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[26]   W Simbanegavi and A Palazzi, (2022).

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Appendix

Table A1: Sample proportion by firm size
Per cent

	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021	2022	2023*
Large	22.9	26.7	22.1	17.9	18.8	15.9	18.0	18.6	19.0	22.8	20.8	19.9
Medium	32.1	29.2	25.9	23.0	23.4	22.0	20.9	20.6	23.0	30.0	32.3	29.9
Micro	26.1	25.4	30.6	34.4	35.2	39.8	38.7	38.9	38.0	29.0	29.2	23.1
Small	18.7	18.4	21.1	24.7	22.2	21.9	22.3	21.5	20.0	18.1	17.2	19.3
Unclassified	0.2	0.2	0.3	0.1	0.4	0.3	0.2	0.4	0.0	0.0	0.5	7.8
Total	100	100	100	100	100	100	100	100	100	100	100	100

* 2023 up to Q3.
Source: BER.