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**Exploring the network of individuals that
influence the media's inflation message in South
Africa**

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Abstract: The main goal of this study—and its potential to add to the policy debate—is to cast light on the network of voices that influence the narrative about inflation and monetary policy in South Africa. To that end, this paper first identifies the main individuals (journalists, domestic policy makers, and financial analysts) that influence the inflation message in the news media. Using social network analysis, graph theory, and opinion leadership techniques, I describe the relationships and identify the most prominent persons in the network. Second, I use textual analysis to compare the inflation narrative of the South African Reserve Bank with that of the financial analysts and the news media. This comparison aims to add information about what these different groups add to the narrative that is developing in the media. The paper finds some nuanced differences in the way the terms inflation and growth are used. The news has a greater focus on how inflation relates to the target. The South African Reserve Bank, in turn, focuses more on the growth outlook compared to the other two fields, while the financial analysts talk more about growth factors from outside of South Africa.

Key words: inflation, inflation expectations, social networks, opinion leadership, South African Reserve Bank, South Africa

JEL classification: A11, D84, D85

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1 Introduction

In the simplest form of communication, two parties are involved: the sender and the recipient. In the context of monetary policy, the sender is the central bank, and one of the recipients is the general public. As the sender, one of the goals of central bank communication is to anchor inflation expectations, a necessary condition for maintaining price stability (Blinder et al. 2022). Central bank communication is there not only to relay its main decisions but also as a tool and to enhance transparency (Blinder 2018). Central bank communication is essential for effective monetary policy-making and serves to enhance the credibility of the institution (Issing 2014; Jeanneau 2009). Blinder (2018) specifically highlights the importance of proper monetary policy communication, which helps with a more effective transmission mechanism and affords the central bank greater legitimacy and democratic accountability. Clear monetary policy communication can also improve trust in the central bank, at least up to a certain point (Horvath and Katuscakova 2016).

The general public is at the receiving end of central bank communication. We observe the general public's inflation expectations, yet it is not always clear what information informs these expectations (Yellen 2016). It is now a well-established finding that inflation expectations are biased and certainly not homogeneous across individuals and households (e.g., Madeira and Zafar 2015; Malmendier and Nagel 2016; Bruine de Bruin et al. 2010; Ehlers and Steinbach 2007 for South Africa). In reality, the general public does not always hear monetary policy information straight from the horse's mouth. In between the central bank and the general public, several other players are relaying, interpreting, and commenting on monetary policy information. I am interested in the first: the players from the news media.

The news media (from here on referred to as the media) is not a passive channel for monetary policy information (Reid et al. 2021). Berger et al. (2011), for example, reveal that the content of media reporting across the eurozone is highly sensitive to the type and content of European Central Bank's (ECB's) communication. Reid and Du Plessis (2011) find the same for South Africa. Furthermore, in the South African context, Reid et al. (2021) emphasize that the media's goals do not always align with those of the central bank. Hence, the message the central bank communicates is not always the message the public receives through the media. Instead, the media is a platform that journalists use to inform the public, interpret the central bank's often more technical communication (Velthuis 2015), and serve to hold democratic institutions to account (Berger et al. 2011)—especially the central bank, which holds a lot of unelected power (Binder 2017; Tucker 2018). Newspapers, moreover, write their stories to suit readers' needs (Mullainathan and Shleifer 2005) while typically being more negatively slanted (Hamilton 2004; Fogarty 2005). In the media, there are often quotes that hail from various sources, most often macroeconomists and financial analysts who are experts in monetary policy. These sets of individuals are also crucial for the message received by the general public but also face their own incentives and constraints regarding communication.

Although the aim of this study is not to directly measure the media's influence on inflation expectations, it is still important to note that the media does have an impact. Studies such as Lamla and Maag (2012) and Lamla and Lein (2014) find that more frequent discussions of inflation in the media correspond to more frequent updating of inflation expectations while improving the accuracy of inflation expectations. Also relevant is a finding by Dräger (2015) that indicates that inflation perceptions—which is, individuals' perceptions of inflation over the previous 12 months—are more strongly influenced by the media when inflation is high compared to when it is low, and this is likely because of greater prevalence thereof in the media in elevated inflation times. This is furthermore confirmed by Berger et al. (2011), who show that the current level of inflation (be it high or low) influences inflation expectations, which subsequently affects the tone (positive or negative) of inflation discussions in the media and how readers perceive it.

Consistent are findings by Coibion et al. (2019) for the Netherlands and Candia et al. (2020) for the US and eurozone, which indicate that the public is much more concerned about inflation above the target (i.e. too high) compared to inflation below the target. From the financial analysts' point of view, a study shows how survey respondents adjust their responses in line with the one-year-ahead projections of professional forecasters (as captured in the Survey of Professional Forecasters in the US) when exposed thereto, revealing that there is some trust in the expertise of professional forecasters (Armantier et al. 2016).

Considering the importance of the media and the relatively unknown world of how expectations about inflation are formed, I am interested in exploring the persons influencing the monetary policy message received by the public via the media. The media messages are often more affected by the opinions of some due to their relationships with the journalists (Reid et al. 2020). The aim of this paper is to explore the network between these individuals to cast some light on what happens between central bank monetary policy announcements and the public's formation of inflation expectations in the South African context. The individuals quoted in the media are divided into two groups: the first includes policy makers such as domestic and international central bankers, ministers of finance, presidents, and other governmental officials—current and former; the second group includes financial analysts, macroeconomists, academic economists, property analysts, and investment specialists. Throughout the text, I will use policy makers to refer to the first group and financial analysts to refer to the second group.

In this paper, I identify the network of individuals that feature in this capacity, describing the relationships between them, and exploring their individual characteristics. For that purpose, I must explain some of the relevant concepts around social network theory and opinion leadership that will be used throughout the paper. This is done in the next section before discussing the data and results in Section 3. In Section 5, I aim to elucidate the narrative differences between the SARB, financial analysts, and news media.

2 Background on social network theory and opinion leadership

A social network is a geometric representation of a complex set of relationships (De Marti and Zenou 2009). Social networks (indicated by (N, g)) consist of two main parts, the nodes (or edges, N), which represent the individuals ($N = (1, \dots, n)$, with n being the size of the network), and the links (connections or vertices, g), which represent the relationships between nodes. The connection between individuals A and B can be written as $g_{A,B} = x$, where x can either be a continuous value between zero (0) and one (1), a weighting of the strength of the relationship, or a binary value, where zero (0) indicates no link and one (1) suggests some link (Goyal et al. 2006). In social network graphs, nodes are usually depicted with dots and connections with lines (with or without arrows) between the dots.

There are broadly two types of networks, one where a connection requires the consent of both individuals, known as directed networks, and the other where connections can occur without one individual consenting, known as undirected networks (e.g., think of a celebrity fan club here) (Jackson 2010). Within directed networks, there are various forms of bilateral relationships, such as where individuals A and B are merely connected (a line without arrows), where individual A sends information to B, where individual B sends information to A, or where individuals A and B send information to each other (arrows in both directions). Connections could therefore be reciprocal, shown by an arrow in both directions, or nonreciprocal, indicated by an arrow in the direction from where the information flows. For example, if information flows from A to B, the arrow would point in A's direction because the assumption is that B chooses to receive information from A. By nature of the information used to construct the network in this paper, I assume it is a directed network since the financial analysts or policy makers need to consent to be quoted by the journalists. That said, where links exist between financial analysts and policy makers

in the same media article, the type of connection could be clearer. In other words, where two financial analysts are quoted in the same article, it is not obvious whether they have reciprocated links (i.e. are in a directed network) or whether the connection is random.

Although writing articles and being quoted in the media already show some measure of influence (Maesse et al. 2021), the aim here is to identify the opinion leaders within this small subset of individuals. An opinion leader is a person who forms the pivot of a social network, i.e. they stand central to a network and are critical for information diffusion (Weimann 1994). To start with this type of analysis, therefore, the opinion leader literature requires constructing a social network to identify the most influential persons in a community (see, for example, Chen 2019; Duan et al. 2014; Bamakan et al. 2019; Li et al. 2019).

A method I want to employ to identify opinion leaders is to count the number of times a name occurs, i.e. to see which journalists write about monetary policy most often and which financial analysts or policy makers are quoted most frequently in the media. Employing more technical methods requires an explanation of some relevant concepts from social network theory for measuring influence and power (Hanneman and Riddle 2005). Degree centrality (or degree) measures the number of direct connections a person has, specifically connections from which an individual in the network can get information. Individuals with degrees two (2) have two (2) direct connections. There should also be a distinction between the in-degree and out-degree centrality of each node in a directed network, the former being a count of incoming connections and the latter a count of outgoing connections.

Sometimes, however, when a network is very small, closed-off, and no new information gets introduced, degree centrality (counting the number of connections) becomes a less informative indicator of opinion leadership. In this case, information merely moves in circles. Betweenness centrality becomes a more useful measure of influence since it measures a person's indirect connections relative to their total number of connections. It tries to capture how much an individual serves as an intermediary between different subsets of a network. Put differently, a high betweenness centrality awards individuals who bridge network gaps since they can access a broader pool of information and spread it more readily. It is therefore an important measure of influence in my case since I am interested in information dissemination. A third measure of power in a social network is closeness centrality, a person's geodesic (social) distance relative to all the other persons in a network. Lastly, eigenvector centrality, or eigencentality, measures a node's relative connectivity, assigning higher scores to nodes that are themselves connected to other nodes with high eigencentality.

All these methods can, in theory, be used to characterize and identify the more influential individuals in the network. The following section presents the data and explains the steps I took to identify the journalists and persons quoted in the media, such as domestic policy makers and financial analysts.

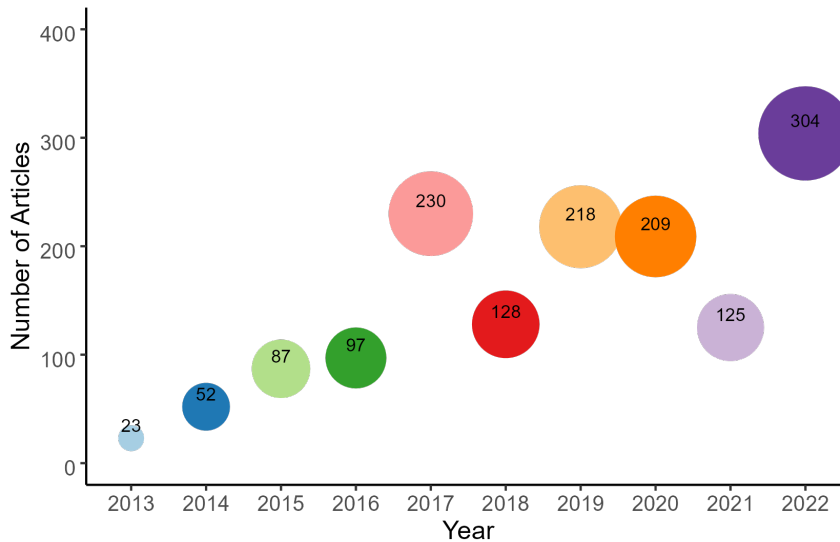
3 Social network identification

3.1 Data

In this paper, a combination of search terms was used to download newspaper articles from South Africa from 2013 to 2022. To capture a substantial number of articles and ensuring sufficient information about the featured journalists and analysts, the sample period was chosen to be long enough but not extended into a timeframe with less available data. For example, implementing the opinion leadership method of

expert identification¹ before 2013 becomes difficult because the current experts will know less about the journalists and analysts who dominated during that time. Moreover, the farther back the search goes, the fewer articles exist in the sample, suggesting that adding years before 2013 would add little additional information. In the original search, there were only 23 articles in 2013, compared to 230 in 2017 and 304 in 2022—the years with the most articles. Figure 1 captures the upward trend in the number of articles in the search.

Figure 1: Number of articles per year



Source: author's compilation based on data.

The original selection of search words in the Factiva² database was "SARB" (South African Reserve Bank), "Monetary Policy", and "Inflation". This paper uses the &-operator instead of the or-operator to get more specific results. The idea behind these search terms was to capture a wide set of South-Africa-specific articles covering topics related to its central bank. This paper focuses on articles covering the SARB and domestic monetary policy, given its objective of determining who influences the narrative around inflation in the media in South Africa. I constructed a word cloud out of all article content to get a sense of the topics covered with the search. To that end, the word corpus is cleaned from unnecessary metadata³ and other obsolete information, in addition to removing common English stop words that are built into the software. The word cloud in Figure 2 reveals—as expected and consistent with the search terms—the top words used were inflation, interest rate, reserve bank, monetary policy, growth, and economy.

¹ Expert identification involves the use of people familiar with a community of individuals to identify the most prominent persons in that network (Valente and Pumpuang 2007).

² Factiva is a platform that aggregates content from both licensed and free newspaper sources, including content from almost all the countries in the world.

³ Some of the obsolete information in the word corpus included names of months, the search platform Factiva, and information around the file path that the programming language picked up as part of the .pdf text.

Figure 2: Word cloud of entire news corpus



Source: author's own calculations based on data extracted from newspapers.

The search yielded a total of 1,484 articles, although this included many duplicates. After removing duplicates, the number of articles shrunk to 816. Despite this duplication, the initial discussion of newspaper coverage keeps all the articles, given that the geographic scope for each newspaper from the same publisher varies and says something about the newspaper’s coverage. Out of the 1,484 articles (total sample including duplicates), most were published in the following newspapers, as can also be seen in Table 1: The Star (198), The Mercury (190), Business Day (177), Cape Times (169), and Pretoria News (162). The Star, The Mercury, Cape Times, and Pretoria News are part of the same publisher, and in most cases, the same article with the same title and by the same journalist feature in each of them.

Table 1: Newspapers and number of articles

| Newspaper | Number of articles |
|-----------------------------------|--------------------|
| The Star | 198 |
| The Mercury | 190 |
| Business Day | 177 |
| Cape Times | 169 |
| Pretoria News | 162 |
| Daily Dispatch | 67 |
| Mail & Guardian Online | 63 |
| The Herald | 47 |
| The Sunday Times | 41 |
| Daily News | 41 |

Note: see Appendix 6 for links to online versions of the newspapers.

Source: author's own calculations based on data extracted from newspapers.

In terms of coverage, the sample contains a broad representation of South African newspapers, not only in terms of reach—such as The Sunday Times and The Star which are, according to the latest AMPS data,⁴ the second and ninth most read newspapers in SA—but also in terms of influence, such as Business Day (Odendaal et al. 2020). In total, the sample features 35 different newspapers. Table 1 contains a list of the top 10 newspapers, sorted by the number of articles in the sample. Table 2, thereafter, shows the newspapers sorted by the publisher. As can be seen in Table 2, many of the newspapers are from the same publisher. Note also that, over the course of the sample period, there were several mergers

⁴ The latest AMPS data are available at this link: https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/?page=2&sk=AMPS&sort_by=title&sort_order=asc&ps=15

and acquisitions that took place between publishing houses,⁵ which means some newspapers changed ownership between 2013 and 2022.

Table 2: List of newspapers by publisher, 2022

| Publisher | Newspapers |
|---|--|
| Arena Holdings (Pty) Ltd | The Sunday Times, Daily Dispatch, The Herald, Sowetan, Business Day |
| Cape Business Online News | Cape Business Online News |
| Government Communication and Information Systems | South African Official News |
| Independent Newspapers (Pty) Ltd | The Star, Cape Times, Sunday Tribune, Weekend Argus, Post, The Mercury, Pretoria News, Sunday Independent, Cape Argus, Daily News, The Independent on Saturday, Saturday Star, Diamond Fields Advertiser |
| Media 24 | Wheels24, Health24, News24, City Press |
| SAPA | South African Press Association |
| SyndiGate Media Inc | Randburg Sun |
| The Mail & Guardian | Mail & Guardian Online |
| The New Age | The New Age |
| Unknown | Eyewitness News, Polity.org.za, Engineering News, SABC News, Citizen, SA People |

Note: some newspapers from the same publisher publish the same newspaper article. Later in the paper when I explore the network of journalists and financial analysts, I remove duplicate articles. Note also the New Age newspaper stopped publication in 2018.

Source: author's own calculations based on data extracted from newspapers and publicly available information.

3.2 Alternative searches

This section compares the results of four similar searches on the Factiva database to the original search as a robustness check. The four alternative Factiva searches were as follows:

- Search 1: SARB & Inflation;
- Search 2: SARB & Monetary Policy;
- Search 3: SARB & Monetary Policy & CPI;
- Search 4: SARB & Inflation & Interest Rate.

Except for Search 4, which includes the phrase "Interest Rate", the other searches returned broadly the same articles as the original search. Search 1 and Search 3 yielded the same number of articles (1,250), whereas Search 2 yielded slightly fewer articles (1,187). Here, the search consisting of only two terms produced fewer articles than the original, which included three search terms. After comparing the coverage of newspapers and journalists in these four searches, it appears very similar: The Star newspaper still has the most articles. In summary, this analysis suggests there is little difference between the original search and the alternatives, and the original search was comprehensive enough to capture enough articles.

⁵ Wikipedia link to Arena Holdings: https://en.wikipedia.org/wiki/Arena_Holdings

Search 4 (SARB & Inflation & Interest Rate), however, gave substantially different results, yielding 2,866 articles with heavy representation by international newspapers (see Appendix A). In the search, there were 136 different newspapers represented, compared to 28 in Search 1, 26 in Search 2, 28 in Search 3, and 35 in the original search. Search 4's coverage is thus far broader and beyond the scope of this paper, where the focus is more on the domestic South African media. I will stick to the original search as it fits the aim of this paper.

4 A network emerges

The next step was identifying the names of persons quoted in the media articles. This paper uses a named entity recognizer (NER) to construct a list of quoted persons. Throughout the paper, individuals in the media are divided into two groups: the first is the authors (journalists) and the second is the individuals quoted in the media. The second group is subdivided into policy makers, such as current or former central bankers, ministers of finance, presidents, and other government officials, and financial analysts, such as macroeconomists, academic economists, property analysts, and investment specialists. Throughout the text, I will use policy makers to refer to the first group and financial analysts to refer to the second group of quoted individuals.

This paper uses a NER to identify the persons quoted in the media. The NER recognizes all name-surname combinations or whenever a name or surname appears separately. Some names appear twice when multiple references exist to the person in the same article. Both of these instances require cleaning. Other cleaning included iterating through the names to correct and the NER's incorrect output of some names. For example, in South Africa it is common to find two- to three-word surnames, which the NER cuts off after the first word in the surname. In this data set an example would be a name such as "Jana van Deventer", which the NER merely recognized as "Jana van" or "Van Deventer". Furthermore, I clean the list of misspelled names and names paired with other random capitalized words, which the NER mistakenly picks up as a name-surname combination. For all of these potential errors, I iterate through the names to replace the correct name-surname combination, and where needed, I use LinkedIn profiles to get the correct spelling.⁶

I remove a substantial number of persons from outside South Africa. I do this to remove persons I assume have been quoted second-hand or referenced only in terms of their economic theories. Given the scope of this paper to focus on domestic opinion leaders, I removed the international policy makers: central bankers such as Jerome Powell, Christine Lagarde, and Mark Carney; politicians such as Donald Trump, Emmanuel Macron, and Boris Johnson; and foreign financial analysts or academics like Paul Krugman or John Maynard Keynes. There are also ample domestic policy makers (South African central bankers, politicians, and government officials) quoted in the articles. I treat these differently from their international counterparts and keep them in the main sample. Later on, I create a sub-sample without domestic policy makers to compare the journalists' networks with and without them.

⁶ As another measure of verification, I asked three persons to provide their classification of the names the NER identified. This included them identifying the names of journalists that were mistakenly placed with the individuals quoted in the media articles and identifying which names are policy makers and which are financial analysts. This is consistent with one of the methods classified by Valente and Pumpuang (2007) on how to identify opinion leaders.

4.1 The journalists

Table 3: Top eight journalists by newspaper

| Author | Number of articles | Newspaper | Articles per newspaper | Number of persons quoted | |
|-------------------------|--------------------|------------------------|------------------------|--------------------------|----------------------------|
| | | | | With domestic officials | Without domestic officials |
| Siphelele Dlodla | 148 | Cape Argus | 1 | 28 | 25 |
| | | Cape Times | 35 | | |
| | | Daily News | 5 | | |
| | | Pretoria News | 32 | | |
| | | The Mercury | 37 | | |
| | | The Star | 38 | | |
| Lynley Donnelly | 52 | Business Day | 29 | 32 | 21 |
| | | Daily Dispatch | 11 | | |
| | | Mail & Guardian Online | 5 | | |
| | | The Herald | 7 | | |
| Sarah Smit | 17 | Mail & Guardian Online | 17 | 10 | 8 |
| Hilary Joffe | 16 | Business Day | 11 | 21 | 14 |
| | | Daily Dispatch | 3 | | |
| | | The Sunday Times | 2 | | |
| Sunita Menon | 16 | Business Day | 11 | 19 | 18 |
| | | Daily Dispatch | 3 | | |
| | | The Herald | 1 | | |
| Bernard Sathekge | 15 | New Age | 15 | 22 | 18 |
| Asha Speckman | 12 | Business Day | 2 | 28 | 25 |
| | | Daily Dispatch | 2 | | |
| | | The Sunday Times | 8 | | |
| Lukanyo Mnyanda | 11 | Business Day | 10 | 16 | 4 |
| | | Daily Dispatch | 1 | | |

Note: the domestic officials referred to in the last two columns of the paper refer to domestic policy makers and government officials, such as SARB governors, ministers of finance, and presidents, who were quoted in the newspaper articles.

Source: author's own calculations based on data extracted from newspapers.

After cleaning the data and sorting for the number of articles per author (journalist), I created Table 3, which lists the eight journalists with the highest number of articles, the newspapers they write for, and how many different persons were quoted by each journalist. Information about the author is typically specified in the metadata of the newspaper article; therefore, it is quite easy to extract. Yet, in the sample of 1,484 articles, only 567 have identified authors. The rest either have no name specified or specifies some generic term such as 'staff writer' (one instance), 'TNA reporter' (one instance), or 'staff reporter' (two instances). Some interesting features arise from journalists' information, and this can be viewed in Table 3.

Siphelele Dlodla is the most published journalist, with 148 articles. These articles appear in the Cape Argus (1), Cape Times (35), Daily News (5), Pretoria News (32), The Mercury (37), and The Star (38). However, Cape Times, Pretoria News, The Mercury, and The Star are from the same publishing house. The most quoted person in Dlodla's articles is Lesetja Kganyago, and in the network without domestic policy makers, the top-quoted financial analyst is Annabel Bishop. Dlodla has a well-connected network with and without domestic policy makers, strengthening the finding that Dlodla has a diverse set of connections.

Lynley Donnelly writes the second-most articles in the sample. Donnelly’s articles are spread between Business Day (29), Daily Dispatch (11), The Herald (7), and Mail & Guardian Online (5). Like Dlodla, Donnelly’s articles feature the policy maker Lesetja Kganyago most frequently but with the addition of another policy maker, Tito Mboweni. Donnelly’s network is well connected but features many more domestic policy makers than Dlodla’s network. Thirdly, Sarah Smit only writes for the Mail & Guardian Online (18 articles), with Smit’s network remaining similar with and without domestic policy makers. Hilary Joffe writes for Business Day (11), Daily Dispatch (3), and The Sunday Times (2) and has a network with many connections. Joffe frequently quotes domestic policy makers such as Lesetja Kganyago, Tito Mboweni, Gill Marcus, and Pravin Gordhan. Kevin Lings is the most-quoted financial analyst, whereas there is no evidence of Annabel Bishop—the overall top-quoted financial analyst—in Joffe’s articles.

Many journalists write for different newspapers, even when overlooking the newspapers from the same publishing house. Although mentioned before, the change in the network when removing domestic policy makers is an essential metric of how much the central bank staff, the Minister of Finance, and other government officials are quoted directly, specifically about topics on inflation. Table 3 shows how the connections for journalists change when excluding the domestic policy makers. The result is most striking for journalists Lynley Donnelly, Hilary Joffe, and Lukanyo Mnyanda, where connections drop more than the others when domestic policy makers are excluded. It is not clear if strong inferences can be made of this occurrence, but it might suggest that these authors pay more attention to the original message instead of relying more on other expert opinions.

4.2 Persons quoted in the newspapers

Policy makers and financial analysts

After capturing the names of the domestic policy makers and financial analysts quoted in the newspaper articles, I continue the process of identifying the opinion leaders. To this end, I look at the domestic policy makers and financial analysts with the most quotes across all the articles, noting that in this part I subset to include only unique articles to focus on the unique connections an individual has. Out of the total of 1,484 newspaper articles in the sample, there are 816 unique newspaper articles. Not surprisingly for the topic under consideration, many domestic policy makers and especially central bankers feature most among the quoted individuals. Table 4 shows the top 10 quoted individuals, with four out of the 10 being domestic policy makers.

Table 4: Top-quoted individuals—with domestic officials

| Persons | Sector | Number of times quoted |
|----------------------------------|--------------------------------|------------------------|
| Lesetja Kganyago | SARB governor (from late 2014) | 84 |
| Annabel Bishop | Financial analyst | 53 |
| Gill Marcus | SARB governor (2013 and 2014) | 47 |
| Kamilla Kaplan | Financial analyst | 38 |
| Mamello Matikinca-Ngwenya | Financial analyst | 38 |
| Tito Mboweni | Minister of Finance (2018–21) | 33 |
| Raymond Parsons | Academic economist | 29 |
| Jeffrey Schultz | Financial analyst | 28 |
| John Ashbourne | Financial analyst | 28 |
| Jacob Zuma | President (until 2018) | 27 |

Note: even though Tito Mboweni was also SARB governor from 1999–2009, I regard it as outside the sample period of this paper.

Source: author’s own calculations based on data extracted from newspapers.

Specifically, Lesetja Kganyago and Gill Marcus, the two SARB governors during the sample period, were quoted 87 and 47 times, respectively. It is interesting to notice that Marcus is quoted more than

half as much as Kganyago, yet Marcus’s tenure only overlaps with two of my sample years (2013 and 2014), whereas Kganyago’s tenure overlaps with eight of my sample years (2014–22). In total, SARB governors and staff were quoted 170 times, if I take the names that appear in the top 50 most quoted individuals. The prominence of the SARB’s staff is unsurprising, given that the articles in this paper’s sample often follow shortly after the SARB’s policy (repurchase (repo) rate) announcement. It confirms that SARB governors, as well as other SARB officials, are influential. From the SARB’s perspective, it is encouraging to see the names of their officials feature this frequently since it suggests that the media take SARB communication seriously and are engaging directly with the original message of the SARB.

Although positionally the financial analysts do not take the top spots, in terms of the total number of quotes recorded for domestic policy makers, financial analysts feature more frequently. As mentioned, out of the top 50 individuals quoted in the media, government officials were quoted 293 times, of which 170 times were SARB officials, whereas all others were quoted 511 times. When removing domestic policy makers, the most-quoted persons are Annabel Bishop, Kamilla Kaplan, and Mamello Matinkinca-Ngwenya. They were quoted 53, 38, and 38 times, respectively. Other names that appear in the top 10 that are interesting are Tito Mboweni (SA Minister of Finance, 2018–21), Jacob Zuma (President of SA, 2009–17), and an additional three financial analysts, Raymond Parsons, Jeffrey Schultz, and John Ashbourne.

Financial analysts

Table 5: Top-quoted individuals—without domestic officials

| Persons | Organization | Number of times quoted |
|-----------------------------------|-------------------------------------|-------------------------------|
| Annabel Bishop | Investec Ltd. | 53 |
| Kamilla Kaplan | Investec Ltd. | 38 |
| Mamello Matinkinca-Ngwenya | FNB | 38 |
| Raymond Parsons | NWU Business School | 29 |
| Jeffrey Schultz | BNP Paribas | 28 |
| John Ashbourne | Capital Economics & Fitch Solutions | 28 |
| Sanisha Packirisamy | Momentum | 23 |
| Kevin Lings | Stanlib | 18 |
| Andrew Golding | Pam Golding CEO | 16 |
| Samuel Seeff | Seeff Chairman | 16 |

Note: information about an analyst’s organizational affiliation is gleaned from a general internet search or LinkedIn information.

Source: author’s own calculations based on data extracted from newspapers and LinkedIn.

Zooming in on the financial analysts in Table 5, specific features are important. All the information referenced here is public, either collected from the information in the newspaper articles or a general internet search. First on the list is Annabel Bishop. Bishop is the Chief Economist at Investec Ltd. and has been with the company since 2001. Bishop is quoted most often in Business Day and the Mail & Guardian Online but also a fair number of times by 11 other newspapers. In terms of page numbers, often an indication of prominence in newspapers, the articles Bishop appears in range from page 1 to page 23, of which most were printed on pages 9 and 2, while also keeping in mind that information about page numbers in online publications are often not available. The length of the articles that Bishop’s name appears in varies quite a bit—where length might also be an indication of prominence. When dividing article length into three categories (0–500, 501–1,000, and >1,000 words), most articles are in the 501–1,000-word range, then the 0–500-word range, and only three articles are longer than 1,000 words. Over the sample period, Annabel Bishop is quoted at least once each year but is quoted most often in 2022, which corresponds to the year when most articles in the sample were published.

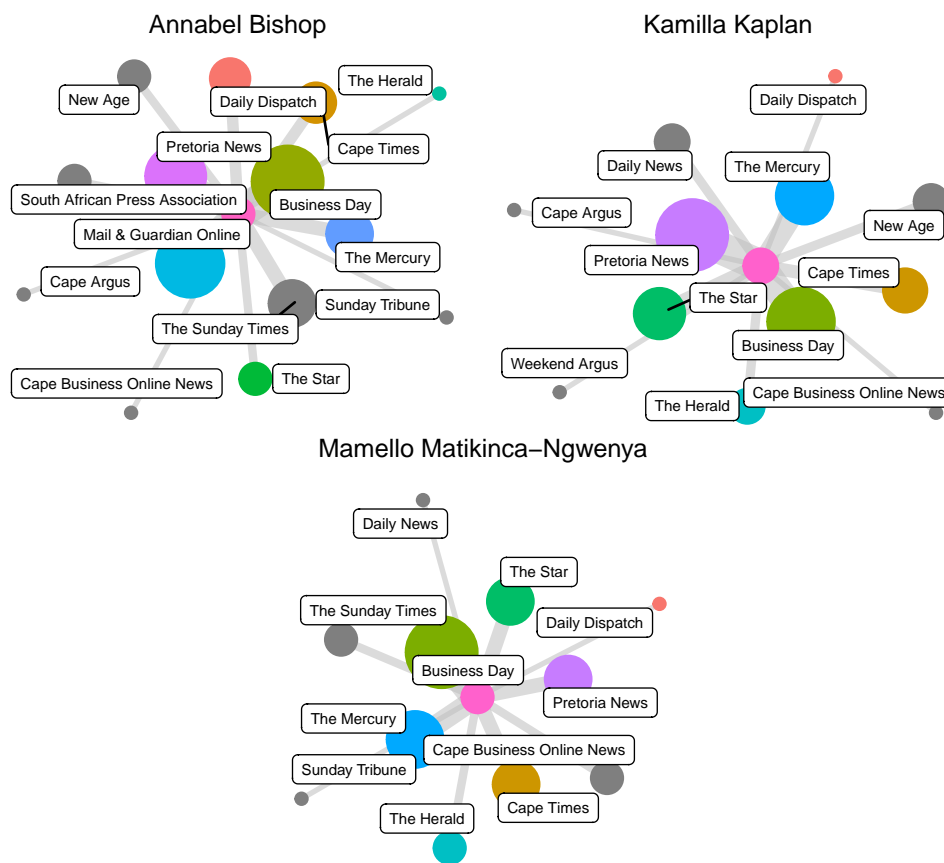
Kamilla Kaplan is the second-most-quoted financial analyst in the sample. Kaplan is also an Investec Ltd. economist, reinforcing this company's prominence in the network. Kaplan is most-often quoted in the Pretoria News (8) and Business Day (7), with sparse quotations in 10 other newspapers. Most articles featuring Kaplan's quotes appear on page 15 of the newspaper. In terms of length, an almost equal number of articles fall within the 0–500-word (19 articles) and 501–1,000-word (18 articles) ranges, with none longer than 1,000 words. In terms of representation in years, Kaplan's name first appeared in 2014 and was quoted most in both 2017 and 2020 (nine articles, respectively).

Thirdly, Mamello Matikinca-Ngwenya is the chief economist at FNB South Africa. Matikinca-Ngwenya's quotes occur most in Business Day (10) and The Mercury (6) in a total of 38 quotes. Matikinca-Ngwenya's name first surfaces in 2017, which is also the year when most quotations occurred. The prominence of Matikinca-Ngwenya quotations varies, with articles ranging from features on page 1 to page 25, with the highest frequency on page 11. Most articles with Matikinca-Ngwenya quotes are in the 501–1,000-word range (25 articles), with none longer than 1,000 words.

It is surprising to see the top two names are both of Investec Ltd. It speaks to this organization's prominence as a commentator on inflation in South Africa and has implications for the second part of this paper, where I use it as a proxy for the voice of financial analysts in the country. Five other names on the top 10 list are financial analysts, either at a bank or academia, like Raymond Parsons from NWU Business School. The last two names on the list, however, are both CEOs of real estate companies. It suggests that the implications of monetary policy decisions on the housing market are important to readers of newspapers in South Africa.

From the opinion leadership literature perspective, it is important to note not only the number of quotations by these individuals but also the diversity of newspapers in which they are quoted. To investigate this, I created a network graph of the individuals and the newspapers they are featured in and a network graph of the individuals and the journalists they were quoted by. As seen in Figure 3, these individuals are quoted across various newspapers, hinting at the reach of their opinions. In Figure 3, the size of the nodes reveals the degree to which the person was quoted in (by) the newspaper (journalist). The eight newspapers with the most articles in the sample are shown in colour, revealing something about the prominence of the newspaper, whereas the other nodes are grey.

Figure 3: Network of top three financial analysts and newspapers



Note: node size indicates how many times the analyst was quoted by a newspaper. The coloured nodes indicate one of the top eight newspapers with the most articles in the sample. The other newspapers are dark gray.

Source: author's own calculations based on data extracted from newspapers.

4.3 Centrality measures

Table 6: Persons with highest centrality measures

| Name | Degree | Closeness | Betweenness | Eigen |
|----------------------------------|--------|-----------|-------------|-------|
| Lesetja Kganyago | 138 | 0.6 | 13,563.0 | 1.0 |
| Annabel Bishop | 86 | 0.5 | 6,628.4 | 0.6 |
| Mamello Matikinca-Ngwenya | 58 | 0.5 | 4,714.6 | 0.5 |
| Tito Mboweni | 76 | 0.4 | 4,119.4 | 0.5 |
| Gill Marcus | 50 | 0.4 | 3,456.5 | 0.4 |
| Lynley Donnelly | 54 | 0.5 | 3,241.8 | 0.4 |
| Bernard Satheke | 44 | 0.4 | 3,059.6 | 0.3 |
| John Ashbourne | 54 | 0.4 | 3,052.6 | 0.4 |
| Kevin Lings | 46 | 0.4 | 2,964.3 | 0.2 |
| Jacques Celliers | 44 | 0.5 | 2,512.2 | 0.4 |

Note: degree centrality indicates how many connections a person has; closeness centrality indicates a person's geodesic (social) distance relative to all the other persons in a network; betweenness centrality measures a person's indirect connections relative to their total number of connections. Eigenvector centrality, or eigencentality, measures a node's relative connectivity, assigning higher scores to nodes that are themselves connected to other nodes with high eigencentality. The names in the table are ranked according to betweenness centrality.

Source: author's own calculations based on data extracted from newspapers.

After cleaning the data from international policy makers and international financial analysts and keeping only all the unique article titles, an undirected network of journalists and quoted individuals emerges. There is often more than one person quoted in an article. Although there exist definite connections between every journalist and each person quoted in an article, there is not necessarily a link between all the persons quoted together in one article; therefore, it is assumed to be an arbitrary connection. That said, to show all the connections that the data reveal, arbitrary or not, I compiled a table that shows the most connected individuals in the network. The network includes all journalists, financial analysts, and domestic policy makers. A link in this network can therefore comprise any of the following connections: a journalist-to-analyst, journalist-to-policy maker, analyst-to-analyst, analyst-to-policy maker, and policy maker-to-policy maker connection. Table 6 is the result and shows the top-ranked individuals in terms of their centrality measures. The various centrality measures reveal different qualities of the individuals, where each individual is a node in the network.

All three groups—policy makers, financial analysts, and journalists—are represented in this table, revealing that each has some role to play in the communication around inflation in South Africa. Of importance here is the betweenness centrality, which measures the person's indirect connections relative to their total number of connections. As an interpretation, it shows a person's ability to bridge gaps in groups and disseminate information. In Table 6, the top five individuals with the highest betweenness centrality are Lesetja Kganyago (policy maker), Annabel Bishop (financial analyst), Mamello Matikinca-Ngwenya (financial analyst), Tito Mboweni (policy maker), and Gill Marcus (policy maker). Looking carefully, one sees Kganyago's betweenness centrality more than doubles the second person's measure. As it should, this bodes well for the SARB as a key role player in spreading information about inflation in South Africa. The table also shows two journalists, Lynley Donnelly and Bernard Satheke, and a CEO, Jacques Celliers of FNB. It is not surprising, for example, to see Lynley Donnelly's name in this list because, as was discussed in Section 4.1, Donnelly was one of the journalists connected to many domestic policy makers.

5 The narrative differences

One shortcoming of only describing the networks, as was done in the previous sections, is that it does not clearly explain how varied the narratives are between the SARB, the financial analysts, and the journalists. To take steps in this direction, the second part of the paper seeks to add information about what these different groups add to the narrative that is developing in the media: the SARB, the news, and the financial analysts. It will aim to say something about the concentration or diversity of views being expressed in the media—the extent to which a small number of voices dominate. This type of study tries to understand how stories influence the economy and has especially gained traction since Shiller's (2017) paper on narrative economics.

From past research and various authors that emphasize the importance of the media as an agenda-setter in society (McCombs 2014), one can deduce that the messages about inflation and monetary policy that appear in the media, as well as the people that influence these messages, have an important impact on the narratives in society on the subject. Several studies, like Lamla and Maag (2012), Lamla and Lein (2008), and Dräger (2015), show that whenever there is more frequent communication of inflation in the media, inflation perceptions are more accurate and inflation expectations move closer to the full information rational expectation (FIRE)⁷ prediction, providing evidence that the inflation narrative is of consequence to the inflation outcome. There are also several studies that quantify the prevalence and tone of certain words in the media and internet searches, showing that the information contained therein, be it inflation as per Guzmán (2011) and Kalamara et al. (2020) or consumer sentiments like Shapiro et al. (2020), Odendaal et al. (2020), and Turrell et al. (2019), are good predictors of actual economic outcomes.

5.1 Data

For this part of the paper, I employ some simple textual analyses to explore the different narratives of the three groups that discuss inflation in some way. Throughout the rest of the paper, I will refer to the three groups as the three fields, split into the news media, the SARB, and the financial analysts. For each field, I use a specific text set for textual analysis.

The first is represented by the news articles, which include all the articles used in the first part of the paper. For the SARB, I use the main document produced after each Monetary Policy Committee (MPC) meeting, the Statement of the Monetary Policy Committee. Lastly, for the financial analysts, I use publicly available economic reports by Investec Ltd. Because this bank's economists are featured strongly in the first part of the paper, I let them represent the financial analysts' point of view. Investec's documents are all published under the 'Focus banner. Investec's economists write newsletters and cover a wide range of topics, some of which follow a statistical release or MPC meeting, while others cover ad-hoc topics on the economy. Such as is typical for most textual analyses, I clean the corpus of any numbers, punctuation, and stop words (common-occurring filler words in English) before undertaking further research.

5.2 Discussions of inflation

To understand the different focuses of the respective fields, I plot word clouds of varying feature associations. Feature associations is a function that draws out all the words closely associated with the feature. This might explain why the words "rand exchange rate" do not appear often in these word clouds. In Figure 4, I see a difference in the words associated with the feature inflation within the dif-

⁷ FIRE is defined as agents making optimal decisions provided they have full knowledge of the past, present, and future, including full knowledge of the dynamics of the model economy (Mallard 2012).

ferent fields. For example, MPC Statements include discussions about inflation that are narrower, with bigrams such as "core inflation", "inflation expectations", and "price inflation" appearing more. On the other hand, newspapers more frequently discuss how inflation relates to the target, using words such as "target", "targeting", "band", "midpoint", "upper", and "anchored". This may imply that the newspapers are concerned about inflation, insofar as it stays within the target. The news also puts greater emphasis on "consumer inflation" and "food inflation"⁸ compared to the MPC Statements but less so than the financial analysts, who use words such as "food", "manufactured", and "fuel" more readily in the context of inflation. Like the news, the financial analysts also talk more about the current inflation conditions, although with fewer words associated with inflation in their corpus.

Figure 4: Words associated with inflation



Note: word clouds feature the words most closely associated with the feature inflation.
 Source: author's compilation based on data.

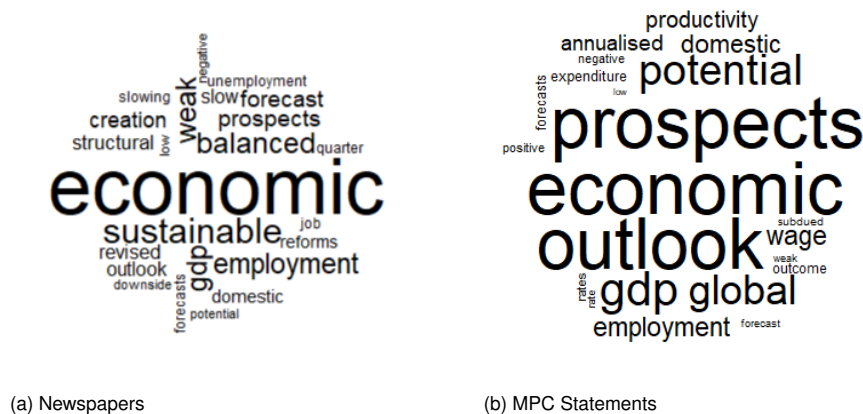
5.3 Discussions of growth

Looking at the words that co-occur with "growth" in the respective fields, as seen in Figure 5, I observe that the first two speak most about economic growth. The MPC Statements talk more strongly about the growth outlook, with words like "outlook", "prospects", and "potential." Other than "economic growth", newspapers seem to have a more diverse set of words appearing less often associated with "growth". In the newspapers, there is more emphasis on growth creation, seen in words like "sustainable", "balanced", "creation", "structural", and "reforms". Although the phrase "economic growth" also features in the financial analyst's corpus, the emphasis here seems more on factors outside of South Africa influencing

⁸ This finding is in line with the argument by Reid et al. (2020) that the media places far more focus on the concern of consumers about the cost of living.

the economic growth assumption, with phrases such as "global growth", "partner growth", "countries growth", and "trading growth" appearing frequently.

Figure 5: Words associated with growth



Note: word clouds feature the words most closely associated with the feature growth.

Source: author's compilation based on data.

6 Concluding remarks

The media plays a vital role in a central bank's communication channel (Blinder 2018), and we know that the media's message is the outcome of an interaction among a series of actors—the SARB, journalists, financial analysts, and ultimately, the general public (Reid et al. 2020). But we still have limited knowledge about how these players interact. This paper seeks to illuminate the role of the media in the monetary policy communication channel by first identifying the individuals commenting on inflation in South Africa's news media from 2013 to 2022 and then characterizing the relationships (networks) between them. This offers insights into how these individuals contribute to the narratives about inflation and monetary policy in South African media. Through this, I can reflect on the relative concentration of the network—how many journalists are responsible for articles being published, how many financial analysts they quote in their articles, and the relative weight given to the voice of the SARB versus other voices.

The first step in this paper was characterizing and finding the relevant data needed for the analysis—namely newspaper coverage and journalistic features. The sample of articles features various South African newspapers, and it finds that journalists write for multiple newspapers. From there, I continued identifying the names of the domestic policy makers and financial analysts quoted in these newspaper articles. Many journalists quote various people, but some, like Lynley Donnelly and Lukanyo Mnyanda,

rely relatively more on domestic policy makers than financial analysts in their quotations. As expected, Lesetja Kganyago is the most featured domestic policy maker in the network, which makes sense given that Kganyago has been the SARB governor since 2014, covering most of the sample period. That said, although positionally the SARB takes the top spots, financial analysts feature more frequently in terms of the total number of quotes recorded. In fact, out of the top 50 individuals quoted in the media, government officials were cited 293 times, of which 170 were SARB officials, whereas all others were cited 511 times. Amongst the financial analysts, Annabel Bishop was featured the most. Many journalists quote Bishop, and Bishop is featured in 13 different newspapers. Across the entire sample of journalists, policy makers, and financial analysts, it is also Lesetja Kganyago and Annabel Bishop with the highest centrality measures, supporting their potential to be opinion leaders in this field.

The important takeaways from this part of the paper are severalfold. There are few individuals commenting on inflation, meaning the voices are concentrated. It is clear that some voices are more pronounced than others. If a better-targeted communication policy increases its effectiveness, one policy implication of this section of the paper is to describe the group of individuals at which the SARB can direct high-impact communication, due to their potential to be opinion leaders. The high level of concentration also highlights some risks. If these individuals that garner much attention are untrustworthy in some sense or if too much disagreement emerges, this could more easily pose risks for the SARB, given the level of concentration. To mitigate this risk, it may be worthwhile for the SARB to improve its direct communication with the public via the media through platforms where the analysts are also quoted. For example, the SARB could consider publishing regular opinion pieces in newspapers. In this way, the un-intermediated voice of the SARB could reach the public. In addition, this could motivate the SARB to continue supporting the strengthening of financial journalism in South Africa, as it has by financially supporting university journalism programmes at the University of the Witwatersrand and Rhodes University.

Having identified the dominant voices on monetary policy and characterized the relationships between them, I turn in the second part of the analysis to explore the content of the messages from these actors. I examined how the different fields use the words "inflation" and "growth". There are some nuances in the way these terms are used. The news has a greater focus on how inflation relates to the target. The MPC Statements, in turn, focus more on the growth outlook compared to the other two fields, while the financial analysts talk more about growth factors from outside of South Africa. This is the start of research on topics of these different fields, which might again cast light on each group's various incentives and motivations. Furthermore, this is an important step in making SARB communication more effective. I have ongoing research in structural and keyword-associated topic modelling, which should likely identify other narrative differences among the SARB, the media, and the financial analysts.

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Appendix

Appendix A

Table A1: Links to online versions of newspapers

| Newspaper | Link to online version |
|--|---|
| Cape Argus | https://www.iol.co.za/capeargus |
| Cape Times | http://capetimes.co.za/ |
| Citizen | https://www.citizen.co.za/ |
| City Press | https://www.news24.com/citypress |
| Daily News | https://www.iol.co.za/dailynews |
| Diamond Fields Advertiser | https://www.dfa.co.za/ |
| Engineering News | https://www.engineeringnews.co.za/ |
| Eyewitness News | https://ewn.co.za/ |
| Mail & Guardian | https://mg.co.za/ |
| Media24 | https://www.media24.com/ |
| Polity.org.za | https://www.polity.org.za/ |
| Post | https://www.iol.co.za/the-post |
| Pretoria News | https://pretorianews.pressreader.com/ |
| Randburg Sun | https://randburgsun.co.za/ |
| SA People | https://www.sapeople.com/ |
| SABC News | https://www.sabcnews.com/sabcnews/ |
| Saturday Star | https://www.iol.co.za/saturday-star |
| South African Press Association | |
| Sunday Independent | https://www.iol.co.za/sunday-independent |
| Sunday Times | https://www.timeslive.co.za/sunday-times/ |
| Sunday Tribune | https://www.iol.co.za/sunday-tribune |
| The Independent on Saturday | https://www.iol.co.za/ios |
| The Mercury | https://www.iol.co.za/mercury |
| The New Age | |
| The Star | https://www.iol.co.za/the-star |
| Weekend Argus | https://www.iol.co.za/weekend-argus |

Note: the South African Press Association does not have its own website, and The New Age stopped publishing in 2018.

Source: general online search.