Causality Analysis of South Africa Reserve Bank's Monetary Policy Statements and Communication*

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Abstract

This paper inspects whether the South Africa Reserve Bank's (SARB) Monetary Policy Committee (MPC) statements trigger have a causality with newspaper reports from the Mail and Guardian between 2010 and 2021. The study examines whether SARB's post MPC statements' readability is reciprocated in the subsequent Mail and Guardian newspaper articles. Using the Flesch Reading Ease Score and Flesch-Kincaid Grade Level score as the methodology, there is a systematic unpacking of both SARB's MPC statements and newspaper reports from the Mail and Guardian which yield a dataset which is subsequently used to create a computation. This computation is then used to examine whether SARB's MPC statements Granger cause the subsequent Mail and Guardian newspaper articles. Resultantly, the results show that there is no Granger causality between the SARB's MPC statements and the Mail and Guardian's Flesch Reading Ease Score and Flesch-Kincaid Grade Level score.

Keywords: Central bank communication; South African Reserve Bank; Monetary Policy Committee statements; Flesch-Kincaid Grade Level score; Granger causality; Flesch Reading Ease Score

JEL Classifications: E52; E58

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Introduction

As noted by Blinder et al., (2008: 941), “Virtually all research to date has focused on central bank communication with financial markets. It may be time to pay some attention to communication with the general public.” With this premise, this study examines the underpinnings of monetary policy communication readability and ultimately, clarity with a particular inquiry into whether this clarity trickles down to what is reported in the media.

Over the past two decades, literature has emerged on the role of central bank communication and its ultimate potency in monetary policy transmission. With this emergent arm of central bank literature, a distinction has emerged in categorising central bank communication. Blinder et al., (2008:4) underscore, that central bank communication embodies two facets, namely: “how communication manages the expectations by creating news and by reducing ‘noise’ in markets”. In essence, this progression of ‘news creation’ would suggest that a central bank is effectively communicating, and the absence of news creation would logically suggest that the same central bank in question is ineffectively communicating.

Monetary Policy and the media

As effective central bank communication emerges as a vital tool in many central banks’ toolkits however, it is critical to note that bare sharing of a central bank’s policy actions it not tantamount to effective communication given the complexity[†] of monetary policy communications. To this end, the media emerges as a critical intermediary which in principle not only acts as a ‘gatekeeper’ but also relays the rather complex monetary communications to the public. Hayo et al., (2008: 27) establish,

“Financial market news is not necessarily created at the time when the information becomes available, but comes into existence only after it goes through a filtering process by the media”.[‡]

Neuenkirch (2009: 52) further enrich this logic noting that the public’s perception of what is reported as economic news only, “comes into existence only after it goes through a filtering process by the media”. As the media has a ‘gatekeeping’ role, the potency of this study lies in the contrast between Monetary Policy Statements and an inquiry into whether there is correlation with subsequent media reports.

The past two decades have seen numerous work on central bank communication[§] but a gap remains on literature around African central banks’ communication and media engagement (Reid, 2011a). Worse even, Mishkin (2004: 16) connotes that, “most of the literature on central bank communication has focused on the quantity and quality of the original communication sent by central banks, emphasizing the need to be simple”. By far, ignoring the delicate relationship between central bank communication and the media despite the fact that monetary policy actions directly affect interest rates, mortgage loans approvals and money supply (Segawa, 2018).

Nonetheless, scholarly work is emerging depicting the relationship between economic agents and the media. For instance, Berger et al., (2011) study how print media coverage was influenced by the quantity of data disseminated by the European Central Bank (ECB) and furthermore, the media reported more negatively**

[†] It should be noted that central bank communications’ textual complexity is a product of their readability as observed by du Rand et al., (2021) whose study on the evolution of SARB’s MPC statements concluded that SARB’s linguistic complexity (readability) varied over time, peaking after the exchange rate crisis and the global financial crisis. They subsequently theorised that this was rather unsurprising as SARB had to communicate new technical concepts in a bid to contextualize and explain their policy responses.

[‡] Hayo et al., (2008) work on financial news finds that the United States’ Federal Reserve System Federal Open Market Committee’s communications such as speeches and post-meeting statements, have causal effects on both returns and volatility. More interestingly, the effects are more pronounced when the communication channel is more formal. Furthermore, their study finds that there is an impact of the Fed’s communications hierarchy as the Board of Governors (BoG) members have a greater impact than regional presidents.

[§] Notable categorisation of central bank communication evolution is outlined by du Rand et al., (2021) who determine that the first evolution of central bank communication practices was a deliberate move away from deliberate opacity in communication. This was later followed by a greater engagement with the public.

** Berger et al., (2011) assessed the favorableness of media reportage the ECB with a sample of 57 newspapers from 1999 to 2010. They concluded that much as the ECB enjoyed positive reporting from a centralised

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on the ECB in the event inflation was outside the target band. Earlier, Doms and Morin (2004) had surmised that consumer opinion^{††} and ultimately expectations^{‡‡} were influenced by reporters' sentiment while reporting the news in question and more even, the frequency of economic news story. This by far further substantiating the role of the media in modern monetary policy.

Later however, Carvalho and Nechio (2014) justify the necessity of the public comprehending the fundamentals of the monetary process^{§§} so as to better appreciate and fathom the inflationary outlook on the horizon.

Bernanke, (2010: 8) further reiterates: "Improving the public's understanding of the central bank's policy strategy reduces economic and financial uncertainty, helps households and firms make more-informed decisions. Moreover, clarity about goals and strategies can help anchor the public's longer-term inflation expectations more firmly and thereby bolsters the central bank's ability to respond forcefully to adverse shocks".

Perhaps the most challenging aspect of central bank communication however is the vastness of any central bank's audience and their differing grasp of monetary policy actions. Kabundi et al., (2014) affirm this with their study on the relationship between inflation and inflation expectations of different market agents. The study concludes that in South Africa, inflation expectations for different market agents varies as unions and businesses have close expectations while unions display higher expectations which are somewhat higher than the SARB's upper bound target.

It is however critical to understand the central banks' audience. Blinder and Wyplosz (2004) submit that the financial audience is principally the inattentive public and the financially literate. In their study, Blinder and Wyplosz (2004) conclude that while agents in participating in financial markets receive their monetary information from the central bank, the inattentive public solely relies on the media for their monetary information.

This principle is underscored by Reid (2011b) who explored the role of the South African newspaper media in the expectations channel of the transmission mechanism of the SARB and concluded that not only does the South African inattentive public acquire their information from the media, but the media's coverage is higher when inflation peaks outside SARB's target range.

It should be noted however that central banks' audiences are heterogeneous in nature and as emphasised by Reid (2011a), not all are necessarily correspondingly attentive to monetary actions. So, in essence, central bank communication frameworks need accommodate this heterogeneity in their communication strategies so as to reach their wide audience. To accommodate this wide audience, SARB communicates through many channels ranging from Governor interviews to monetary policy statements (South African Reserve Bank, 2006).

More pressingly, as earlier highlighted the heterogeneity of inflation expectations across analysts, business, and trade unions in South Africa during the inflation targeting regime further fortifies the variances in the grasp of monetary policy across different agents (see Kabundi et al., 2014) and reaffirms the role of the media in acting as a conduit to reaching the inattentive public.

communication effort, the same centralised communication efforts bore no fruit when inflation exceeded the 2% mark.

^{††} Doms and Morin's (2004) study explores how news reports in the USA affect perceptions of economic performance among consumers with particular focus on University of Michigan's Survey of Consumers from January 1978 through May 2003.

^{‡‡} Doms and Morin's (2004) examine the effects of economic reportage on consumer perceptions with focus on the relationship between "The Economist's" tone and volume of media reports and consumer perception. Their study concludes that in times of high frequency news, the consumers tended to adjust their expectations faster and the opposite held true.

^{§§} Many central banks today subscribe to Taylor's (1993) work to guide their monetary actions. This guides that a central bank should set interest rates according to a 'Taylor rule' that specifies a "specific band target for the policy rate as a function of deviations of inflation from its objective and some measure of slack in economic activity, such as the output gap."

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Cukierman (2009: 20) reiterates: "Most members of the general public are rationally inattentive to the original forms of central bank communication as these are costly to acquire and process. This rationally inattentive audience relies (to varying degrees admittedly) on the media to gather, condense and interpret this primary information on their behalf. As a result, reporting on monetary policy in the media, of which the central bank's communication forms part, is one point of strategic interaction between the stakeholders who codetermine the path of inflation".

Nonetheless, Cukierman's (2009) submission however, assumes that the media three assumptions. Firstly, the media fully understands central banks' policy actions (in line with its objectives), then it can aptly filter out the central banks' objectives and finally condense the message in language relatable to the inattentive public without altering the original message.

This is not the case as exposed by Reid's (2011b:60) findings on South African newspapers' coverage of SARB's MPC decisions: "Even years after the introduction of the inflation targeting framework, misunderstandings of the fundamental issues were not uncommon. For example, in June 2006, the editorial of the Business Day displayed a misunderstanding of the forward-looking nature of monetary policy and the flexibility with which the SARB conducts inflation targeting".

With Neuenkirch (2009); Cukierman (2009) conclusions, there emerges a basis for a notion that financial media digests economic and financial information which is subsequently disseminated onto the general public in a manner that is more comprehensible. The idea of condensing is best explained with two media studies theories. Firstly, agenda setting theory which refers to the idea that there is a strong correlation between the emphases that mass media place on certain issues (McCombs and Shaw, 1972). Over the past fifty years, agenda setting scholars have examined the "cross-lagged relationship" between mainstream media and how they may set the agenda of the public (Servin and Tankard, 2001) and findings have revealed that agenda setting has linked the public's perception of what is important to issues mentioned in mainstream media. This is a phenomenon, conceptualised as salience. From agenda setting follows the Katz's and Lazarsfeld's (1955)^{***} two-step theory which conveys that mass media information is relayed to the "masses through opinion leadership".

The people with most access to media, and having a more literate understanding of media content, explain and diffuse the content to others. Gentzkow and Shapiro (2006a) however, caution that news reporting responds sturdily to consumer preferences^{†††} given the fact that demand weighs strongly in media coverage. As a result of the media slant as established by Gentzkow and Shapiro (2006a), there arises a need for more scrutiny on the media's 'gatekeeping' and filtering role given the different agendas (see McCombs and Shaw, 1972) of the media therein creating a trade-off: 'simplicity' at the expense of the original message which is more complex.

Monetary policy communication routinely takes two forms. These can be through the original publication from the monetary institution in way of policy announcements or inflation reports and communication through speeches and interviews (Demiralp et al., 2012). For both avenues, the media acts as a critical disseminator of the monetary information portrayed. Moreover, given the heavy reliance of the 'inattentive public' on the media to disseminate financial information, the media inadvertently finds itself as foster of monetary policy transmission given that the expectations channel under any inflation targeting frameworks is highly dependent on anticipated future inflation expected future output gap, and the expected future real exchange rate (Svensson, 1999). In addition, because private-sector expectations of inflation affect current pricing decisions and inflation for the next few quarters, it is essential to anchor private sector inflation expectations in line with the inflation target so as to achieve the stability of actual inflation (Svensson, 2010).

^{***} Lazarsfeld et al (1955) put forward the idea that given the media's reportage, perceptions tend to flow from respected commentators from the media houses to opinion leaders in the public who then pass this information on to the relatively inattentive public.

^{†††} Gentzkow and Shapiro (2010) examine the tone of the media in line with partisan language in the reporting the news on Democrats and Republicans in the US Congress. Their results then rely on ZIP code placement data to pinpoint the leaning of the newspaper readers and consumer predispositions.

Monetary Policy, credibility and the Media

As established earlier, many inflation targeters rely on the expectations channel to contain market agents' expectation and as a result, many central banks find themselves in an endless search for credibility which by and large is a product of transparency.

A challenge for many central banks however, is the vastness of their target audiences and their disparities in monetary policy comprehension. With these disproportions in monetary knowledge, some of the central banks' audiences can be effortlessly reached such as financial market agents while others need the media to digest and disseminate this information (Berger et al., 2011). As conceptualised by Reid (2011a), the 'attentive public' which is often always apprised of the central bank communications finds itself reacting hastily to central bank communications, given their proximity to the 'central bank noise' and also their grasp of monetary policy matters.

Meanwhile, the inattentive public which is often unaware of original central bank communications, exhibits a slow reaction function. Perhaps the most crucial challenge with this slow reaction function of the inattentive public is their role in influencing inflation expectations (see Kabundi et al., 2014).

Nonetheless, Brand, et al., (2010) argue that this discrepancy can be countered with combination of transparency and communication which in essence moderate uncertainty, therein calming^{‡‡} the public's expectations. This notion is further augmented by Berger et al., (2011: 690) who affirm the role of the media in this sequence: "The general public rarely directly reacts to central bank communication but 'gets its news' indirectly through the media. The question, thus, becomes whether and how central banks are able to get their message out through the media as an intermediate transmitting device and how this affects the views and possibly the behaviour of the public".

Gentzkow and Shapiro (2006b) further assert the relevance of the media fortifying that at moments of economic uncertainty, the inattentive public relies on the traditional media sources. It should be noted that this premise only applies to the attentive public (for example analysts) who are apprised with the complexity of central bank policy actions and can hence qualify 'economic ambiguity'.

Does communicating mean clarity?

Many central banks today rely on an inflation targeting framework ever since its inception by the Reserve Bank of New Zealand in 1990. Given the widespread approval of inflation targeting and its reliance of managing market agents' expectations, it is comes as no surprise that the same market agents exhibit a 'reaction function'^{§§§} to central bank communications (Blinder et al. 2008). Nevertheless, the immensity of central bank audiences (ranging from opinion-makers in the media to politicians and ultimately to the whole electorate), dictates that their communication methods need differ in line with the audience in question, thus the incontestable rationale for central bank clarity over 'mere transparency' (Reid et al., 2019; Fracasso et al., (2003). In other words, different communication styles are relied on depending on the audience and this heterogeneity is very critical in achieving a central bank's mandate. Take for instance, SARB issues Monetary Policy Committee statements and Monetary Policy Forum reviews with the latter being less complicated with a clear intention to reach different audiences. Consequently, a central bank not only communicates their future policy action but also their reaction function and in so doing, fostering the process of monetary policy transmission and financial stability^{****}.

^{‡‡} Brand, et al., (2010) examine intraday movements in the money market rates. Using this data, they generate specific indicators on monetary policy news with keen focus on the ECB. Their study illustrates the role of communication in managing expectations while empirically illustrating that the ECB's communication has an impact on longer maturities' interest rates.

^{§§§} Studies have emerged over the past twenty years which show that monetary communications such as inflation reports, and speeches indeed can affect the term structure of interest rates (see Andersson et al., (2006)

^{****} Filardo et al., (2019) explores the relevance of the monetary policy reaction function in the quest for financial stability by quantifying the reaction of the US Fed's policies in the equity and credit markets. Their study concludes that in times when the Fed's policy actions appear to react countercyclically to market overheating, imbalances tend to correct over time. The study illustrates the relevance of the "policy reaction function" channel of monetary policy and its role in the financial cycle in the pursuit of financial stability.

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Montes and Nicolay's (2017:3168) expose that central bank communication clarity is, "the quality^{†††} of information provided and the capacity of comprehension the public has reading what central bank communicates. Furthermore, a clearer message is able to help central banks in the task of guiding the expectations of the public in an easier way than an opaquer message".

Upon this submission, Montes and Nicolay's (2017) justify the necessity of improved readability of central bank communications as readability aids central bank transparency, and as defended by Jansen (2011), it is almost implausible to yield transparency in central bank communication absent readability.

In the quest to quantify central banks communications' clarity two methods have emerged; the Flesch-Kincaid grade level (Kincaid et al. 1975) and the Flesch ease score (Flesch 1948) and the. Similarly, one way to quantify central bank communication clarity, is by asking how easy it would be for someone to understand the information contained in the central bank document. This concept of clarity motivates the choice for the Flesch- Kincaid grade level score and the Flesch ease score methods in quantifying clarity of SARB's MPC statements.

It should be noted however, that readability alone is not enough in fostering clarity but consistency in readability as defended by Issing (2005:71) who exposes: "An appropriate strategy, a convincing track record, and thus a consistent communication policy complement each other and are a sign of an effective monetary policy. A clear strategy can also provide stability to the analytical framework and decision-making process for monetary policy".

Methodology

Flesch Reading Ease

In this section, we use the Flesch Reading Ease score to quantify the readability of SARB's MPC statements. The study relies on the Flesch Reading score to quantify texts' facets by analysing the word count, total sentences and the number of syllables per word (Flesch, 1948). This figure is then represented on a scale of 0 to 100 derived from the formula below:

$$206.835 - 1.015 \left(\frac{\text{total words}}{\text{total sentences}} \right) - 84.6 \left(\frac{\text{total syllables}}{\text{total words}} \right) \quad (1)$$

Source: Flesch (1948)

Flesch-Reading-Ease scores can be between 1 and 100 with 100 being very easy to understand and 0 as very difficult. The underlying premise is that readability is decreased as the number words per sentence increases, and that a higher number of syllables per word also decreases readability.

^{†††} Montes and Nicolay (2017) define communication quality as the public's capability to comprehend the information reported to them. With this premise, it becomes critical for any central bank to share information that is readable by the public so as to ease comprehension. Jansen (2011) further proposes that hard to read central bank communications can buoy the public to simply abandon the text in question given its complexity.

Figure 1: An interpretation of the Flesch reading ease score
Source: Flesch (1979)

Flesch–Kincaid grade level

The study goes on to use Kincaid's grade level formula to complement Flesch's reading ease score. Kincaid et al. (1975), later supplemented Flesch's (1948) formula, giving way to the Flesch–Kincaid grade level index. The index devised by Kincaid et al. (1975) denoted the number of years one need to study in order to comprehend a text. The basic equation:

$$0.39 \left(\frac{\text{total words}}{\text{total sentences}} \right) + 11.8 \left(\frac{\text{total syllables}}{\text{total words}} \right) - 15.59 \quad (2)$$

Source: Kincaid et al. (1975)

The Flesch-Kincaid grade level scores texts from 0 to 18 with a rationale that the higher the grade level, the more difficult to read.

Table 1: Interpretation of the Reading Ease Scores with Estimated Reading Grade by Flesch (1949)

Reading Ease Score	Interpretation	Estimated Reading Grade
0 to 30	Very difficult	College graduate
30 to 40	Difficult	13 th to 16 th grade
50 to 60	Fairly difficult	10 th to 12 th grade
60 to 70	Standard	8 th and 9 th grade

VALIDATION OF THE FLESCH-KINCAID GRADE LEVEL

70 to 80	Fairly easy	7 th grade
80 to 90	Easy	6 th grade
90 to 100	Very easy	5 th grade

Source: Hensel, (2014).

Results

In this section, we compute the Flesch reading ease score and the Flesch-Kincaid grade level results for both SARB's MPC statements and the corresponding Mail and Guarding Flesch reading ease score and the Flesch-Kincaid grade level scores and examine Granger causality.

Figure 2: SARB Flesch-Kincaid Grade Level computation

As noted in the methodology, the Flesch-Kincaid Reading Ease Score concerns the years of study needed to comprehend the text being studied. The graphical representation of the computation shows that until 2016, SARB's MPC statements averaged 13 which is a high score and this only dropped post-2016.

Notably, despite the Flesch-Kincaid Reading Ease Score, dropping post-2016, the Flesch Reading Ease Score computation after 2016 ascended illustrating conversely more syllables, longer sentences and ultimately more complexity in overall sentence structure and phraseology.

Figure 3: SARB Flesch Reading Ease Score computation

This makes for an interesting trend as Rudolf Flesch's initial submission for formulating his Flesch formula (see formula 1) was the fact that some 'text' was "designed to make reading as difficult as possible". Because Flesch scholarship on readability was premised on the sentence quantity and length, it is clear why the Flesch score signals deteriorating readability over time in the SARB statements while the computation analysis for the Flesch-Kincaid index signals improved readability over time. As the SARB cut down on the syllables over the past two decades, the sentence count over the same period of time only increased.

Figure 4: SARB Flesch-Kincaid Grade Level and Flesch Reading Ease Score computation

Meanwhile, the results for the Flesch-Kincaid Grade Level computation of the Mail and Guardian newspaper hold at around 10 as illustrated in figure 5.

Figure 5: Mail and Guardian Flesch-Kincaid Grade Level computation

The corresponding Mail and Guardian Flesch Reading Ease Score computation also holds at the 50 mark as illustrated below.

Figure 6: Mail and Guardian Flesch Reading Ease Score computation

Figure 7: Mail and Guardian Flesch Reading Ease Score and Flesch-Kincaid Grade Level and computation

Figure 8: SARB Flesch, Flesch-Kincaid and Mail and Guardian Flesch, Flesch-Kincaid

Test for Stationarity with hypothesis

“H0: The series is non-stationary (has unit root).

H1: The series is stationary.

Rejection Criteria: Reject H0 if the absolute value of the test statistic is greater than the absolute value of the critical value.”

Table 2: Analysis Results-1

`. dfuller SARB_Flesh_Kincaid, regress`

Dickey-Fuller test for unit root Number of obs = 129

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.066	-2.888	-2.578

MacKinnon approximate p-value for Z(t) = 0.0292

D. SARB_Flesh_Kincaid	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SARB_Flesh_Kincaid L1.	-.1495166	.0487636	-3.07	0.003	-.2460109	-.0530223
_cons	1.822584	.6133051	2.97	0.004	.6089641	3.036204

The results show a test statistic of -3.066. Given that the absolute value of the test statistic (5.030) > the absolute value of the critical value at 5% significance level (2.888), the null hypothesis is rejected, and it is concluded that SARB's Flesch-Kincaid Grade Level series is stationary or does not have unit root. That is Flesch-Kincaid Grade Level is I (0).

Table 3: Analysis Results-2

`. dfuller SARB_Flesch , regress`

Dickey-Fuller test for unit root Number of obs = 129

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-5.073	-2.888	-2.578

MacKinnon approximate p-value for Z(t) = 0.0000

D. SARB_Flesch	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SARB_Flesch L1.	-.3440561	.0678183	-5.07	0.000	-.4782562	-.2098559
_cons	14.86415	2.929347	5.07	0.000	9.067499	20.6608

In addition, relating to SARB's Flesch Reading Ease Score, the absolute value of the test statistic registered that (5.073) which was greater than the absolute value of the critical value at 5% significance level (2.888) which infers that that SARB's Flesch Reading Ease Score was also I (0).

Table 4: Analysis Results-3

. dfuller M_G_FleshKincaid , regress

Dickey-Fuller test for unit root Number of obs = 66

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-5.163	-2.917	-2.594

MacKinnon approximate p-value for Z(t) = 0.0000

D. M_G_FleshKincaid	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
M_G_FleshKincaid L1.	-.5669368	.1097982	-5.16	0.000	-.7862839	-.3475897
_cons	5.886003	1.174884	5.01	0.000	3.538902	8.233103

The results for the Mail and Guardian regress showed that the absolute value of the test statistic registered at (5.163) which is greater than the absolute value of the critical value at 5% significance level (2.917) ergo the Mail and Guardian Flesch-Kincaid Grade Level was also I (0).

Table 5: Analysis Results-4

. dfuller M_G_Flesch , regress

Dickey-Fuller test for unit root Number of obs = 66

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-5.003	-2.917	-2.594

MacKinnon approximate p-value for Z(t) = 0.0000

D.M_G_Flesch	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
M_G_Flesch L1.	-.5484055	.1096262	-5.00	0.000	-.767409	-.3294021
_cons	28.11103	5.631628	4.99	0.000	16.86056	39.3615

In addition, the Mail and Guardian Flesch Reading Ease Score absolute value registered a test statistic of (5.003) which is also greater than the absolute value of the critical value at 5% significance level (2.917) and therefore the Mail and Guardian Flesch Reading Ease Score is I (0).

Subsequently, since all the series were stationary, a vector autoregressive was used to test for Granger causality. It should be noted that vector autoregressive was used in this study specifically to examine the possibility of a relationship between SARB MPC statement's readability and the corresponding Mail and Guardian newspaper articles' readability. Having established a computation for Flesch and Flesch-Kincaid indices for SARB's MPC statements, the study relies on the Granger causality test to examine if at all there exists a causality between SARB's MPC statements' Flesch and Flesch-Kincaid computation and Mail and Guardian's Flesch and Flesch-Kincaid computation. In essence providing an empirical test for whether SARB's MPC statements' readability trickles down to the corresponding Mail and Guardian articles' readability.

Relying on Granger (1969) whose work examines whether the prediction of one computation is improved by incorporating the knowledge of a second computation, the study is able to examine the potential causality of Mail and Guardian's Flesch and Flesch-Kincaid scores being influenced by the readability, or lack thereof, of SARB's MPC statements.

Steps for Granger Causality Test

Granger casualty test on the SARB Flesch-Kincaid Grade Level with the M&G Flesch-Kincaid Grade Level

There are two sets of hypotheses to be tested.

Set 1:

HO: SARB's Flesch-Kincaid Grade Level does not granger cause Mail and Guardian Flesch-Kincaid Grade Level.

H3bi: SARB's Flesch-Kincaid Grade Level granger causes Mail and Guardian Flesch-Kincaid Grade Level.

Set 2:

HO: Mail and Guardian Flesch-Kincaid Grade Level does not granger cause Flesch-Kincaid Grade Level.

H3bii: Mail and Guardian Flesch-Kincaid Grade Level granger causes Flesch-Kincaid Grade Level.

Lag estimation

The varsoc command was ran to determine the optimal lag. The varsoc command was ran to determine the optimal lag. Varsoc is a command used in stata to estimate the optimal number of lags for estimation of models. It produces results for a number of criteria such as LR, PFE, AIC, HQI and SBICC to estimate the optimal lag for analysis. In addition, varsoc can be used as a pre-estimation or a postestimation command. The pre-estimation version can be used to select the lag order for a VAR or vector error-correction model (VECM).

Table 6: Analysis Results-5

. varsoc SARB_Flesh_Kincaid M_G_FleshKincaid, maxlag(8)

Selection-order criteria

Sample: 72 - 130

Number of obs

=

59

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-245.972				15.3339	8.40582	8.43331	8.47624
1	-177.562	136.82	4	0.000	1.72781	6.22244	6.30491	6.43371
2	-168.626	17.873	4	0.001	1.46252*	6.0551*	6.19256*	6.40723*
3	-168.179	.89354	4	0.925	1.65209	6.17555	6.36799	6.66853
4	-166.617	3.1226	4	0.538	1.79906	6.25822	6.50564	6.89204
5	-164.976	3.2821	4	0.512	1.95669	6.33818	6.64059	7.11286
6	-159.424	11.105*	4	0.025	1.86731	6.28556	6.64294	7.20108
7	-159.04	.76896	4	0.943	2.12797	6.40812	6.82049	7.46449
8	-156.971	4.1368	4	0.388	2.2966	6.4736	6.94095	7.67082

Endogenous: SARB_Flesh_Kincaid M_G_FleshKincaid

Exogenous: _cons

Four of the criteria selected lag 2 and one selected lag 2. Thus, since majority indicated lag 2, that was the one used.

Table 7: Analysis Results-6

Vector autoregression

Sample: 66 - 130
Log likelihood = -186.7614
FPE = 1.460901
Det(Sigma_ml) = 1.073315
Number of obs = 65
AIC = 6.054198
HQIC = 6.186188
SBIC = 6.388719

Equation	Parms	RMSE	R-sq	F	P > F
SARB_Flesh_Kinc~d	5	.672553	0.9022	149.8514	0.0000
M_G_FleshKincaid	5	1.66878	0.2383	5.084733	0.0014

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SARB_Flesh_Kincaid						
SARB_Flesh_Kincaid						
L1.	.5016803	.1088776	4.61	0.000	.2838927	.7194679
L2.	.4794348	.110021	4.36	0.000	.25936	.6995095
M_G_FleshKincaid						
L1.	.0418017	.0491296	0.85	0.398	-.0564721	.1400755
L2.	-.0529508	.0476754	-1.11	0.271	-.1483159	.0424142
_cons	.2474716	.7603272	0.33	0.746	-1.273409	1.768352
M_G_FleshKincaid						
SARB_Flesh_Kincaid						
L1.	-.239061	.2701541	-0.88	0.380	-.7794497	.3013277
L2.	.2200899	.2729912	0.81	0.423	-.3259738	.7661536
M_G_FleshKincaid						
L1.	.5324931	.1219035	4.37	0.000	.2886498	.7763363
L2.	-.1387276	.1182954	-1.17	0.246	-.3753535	.0978984
_cons	6.550009	1.886573	3.47	0.001	2.776302	10.32372

Table 8: Analysis Results-7

. vargranger

Granger causality Wald tests

Equation	Excluded	F	df	df_r	Prob > F
SARB_Flesh_Kinc~d	M_G_FleshKincaid	.70116	2	60	0.5000
SARB_Flesh_Kinc~d	ALL	.70116	2	60	0.5000
M_G_FleshKincaid	SARB_Flesh_Kinc~d	.39287	2	60	0.6768
M_G_FleshKincaid	ALL	.39287	2	60	0.6768

Set 1 Conclusion: The results shows that SARB's Flesch-Kincaid Grade Level does not granger cause Mail and Guardian Flesch-Kincaid Grade Level (p-value = 0.6768 > 0.05).

Set 2 Conclusion The results shows that Mail and Guardian Flesch-Kincaid Grade Level does not granger cause SARB Flesch-Kincaid Grade Level (p-value = 0.5000 > 0.05).

Thus, it is concluded that there is no granger causality between SARB's Flesch-Kincaid Grade Level and Mail and Guardian Flesch-Kincaid Grade Level.

Granger casualty test on the SARB Flesch Reading Ease Score with the M&G Flesch Reading Ease Score

There are two sets of hypothesises to be tested.

Set 1:

HO: SARB Flesch Reading Ease Score does not granger cause Mail and Guardian Flesch Reading Ease Score

H1: SARB Flesch Reading Ease Score granger causes Mail and Guardian Flesch Reading Ease Score

Set 2:

HO: Mail and Guardian Flesch Reading Ease Score does not granger cause SARB Flesch Reading Ease Score

H1: Mail and Guardian Flesch Reading Ease Score causes SARB's Flesch Reading Ease Score granger

Lag estimation

Table 9: Analysis Results-8

```
. varsoc SARB_Flesch M_G_Flesch, maxlag(8)
```

Selection-order criteria

Sample: 72 - 130

Number of obs

=

59

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-392.894				2231.66	13.3863	13.4137	13.4567
1	-351.663	82.462*	4	0.000	631.816*	12.1242*	12.2067*	12.3355*
2	-348.323	6.68	4	0.154	646.525	12.1466	12.284	12.4987
3	-346.765	3.1165	4	0.539	703.321	12.2293	12.4218	12.7223
4	-345.402	2.7261	4	0.605	771.053	12.3187	12.5661	12.9525
5	-341.338	8.1281	4	0.087	772.484	12.3165	12.6189	13.0912
6	-340.056	2.5638	4	0.633	852.026	12.4087	12.7661	13.3242
7	-339.917	.27727	4	0.991	979.086	12.5396	12.9519	13.5959
8	-337.893	4.0489	4	0.399	1058.25	12.6065	13.0739	13.8038

Endogenous: SARB_Flesch M_G_Flesch

Exogenous: _cons

All 5 criteria selected lag 1 and. Thus, lag 1 was used for testing for granger causality.

Table 10: Analysis Results-9
Vector autoregression

Sample: 65 - 130
Log likelihood = -390.7597
FPE = 571.0013
Det(Sigma_ml) = 476.0143
Number of obs = 66
AIC = 12.02302
HQIC = 12.10168
SBIC = 12.22208

Equation	Parms	RMSE	R-sq	F	P > F
SARB_Flesch	3	3.06176	0.6879	72.73553	0.0000
M_G_Flesch	3	7.46523	0.2100	8.773187	0.0004

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SARB_Flesch						
SARB_Flesch L1.	.8361178	.0694417	12.04	0.000	.6973497	.974886
M_G_Flesch L1.	.0085133	.0443028	0.19	0.848	-.0800188	.0970455
_cons	6.96767	3.736876	1.86	0.067	-.4998811	14.43522
M_G_Flesch						
SARB_Flesch L1.	.0324919	.1693135	0.19	0.848	-.3058541	.3708379
M_G_Flesch L1.	.4507144	.1080197	4.17	0.000	.2348543	.6665745
_cons	26.72349	9.111293	2.93	0.005	8.51602	44.93095

Table 11: Analysis Results-10

. vargranger

Granger causality Wald tests

Equation	Excluded	F	df	df_r	Prob > F
SARB_Flesch	M_G_Flesch	.03693	1	63	0.8482
SARB_Flesch	ALL	.03693	1	63	0.8482
M_G_Flesch	SARB_Flesch	.03683	1	63	0.8484
M_G_Flesch	ALL	.03683	1	63	0.8484

Set 1 Conclusion: The results show that SARB's Flesch reading ease score does not granger cause Mail and Guardian Flesch reading ease score (p-value = 0.8484 > 0.05)

Set 2 Conclusion: The results shows that Mail and Guardian Flesch reading ease score does not granger cause SARB Flesch reading ease score (p-value = 0.8482 > 0.05).

Discussions

The findings of this study clearly show that between 2010 and 2021, although there might appear to be a co-movement between SARB's MPC statements' Flesch-Kincaid Grade Level score and Flesch Reading Ease Score to Mail and Guardian's statements' Flesch-Kincaid Grade Level score and Flesch Reading Ease

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Score, the granger casualty test reveals that there is no causality between the two variables. However, there are clear instances where a spike in SARB's MPC statements' Flesch-Kincaid Grade Level score and Flesch Reading Ease Score is evidently reflected on Mail and Guardian's corresponding Flesch-Kincaid Grade Level score and Flesch Reading Ease Scores, as was the case for the 26th October 2010 SARB MPC statement which recorded a Flesch-Kincaid Grade Level score of 13.4. This was a standout score in the ten-year dataset, and interestingly the score is reciprocated on Mail and Guardian's Flesch-Kincaid Grade Level score which registered at 14.2. This occurrence is repeated again on 22nd July 2010 where the SARB MPC statement scored 13.7 on the Flesch-Kincaid Grade Level score only for the Mail and Guardian score to also soar to 12.6.

An explanation for this occurrence is the direct quotation reporting style which is evident on both dates. On 22nd July 2010, the SARB MPC statement read: "The sovereign debt crisis in Europe appears to have had a short-term respite, but significant longer-term risks and uncertainties persist."

In reciprocity, the Mail and Guardian article dated 22nd July 2010 reads: "We see that global economic outlook remains uncertain. The sovereign debt crisis in Europe has had a short risk, but significant long-term risks and uncertainty persist."

The same direct reportage is repeated for the monetary policy stance which is a clear copy of the statement from the SARB MPC statement. The Mail and Guardian article reported that: "The monetary policy committee assesses the risk to the inflation outlook as being evenly balanced and views the current monetary policy stance as appropriate."

This is the same statement from the 22nd July 2010 SARB MPC and in essence explains the co-movement between the two as direct reportage from the newspaper articles creates an 'artificial' co-movement. But as argued by Reid et al., (2019: 33) the media is often drawn towards "the real economic consequences of monetary policy and tends to over-simplify".

This is a theme that emerges in the Mail and Guardian articles with headlines such as: "Consumers have a little more money for Easter eggs" (Mail and Guardian, 2018).

In summation, if the Mail and Guardian is directly quoting a SARB MPC statement, then any spike or drop in SARB's readability will trickle down to the corresponding Mail and Guardian newspaper article.

Admittedly, this is contrary to Cukierman (2009) argument that most members of the general public are rationally inattentive and rely on the media to gather, condense and interpret this primary information on their behalf as the Mail and Guardian categorically disseminates SARB's message to an extent, in its original form—by far undermining the earlier discussed filtering role of the media.

Conclusion

While central banks communicate to a wide range of market participants, their interaction with the media has remained a complex facet of monetary policy transmission. While many studies have explored the media and monetary policy such as media coverage when central banks announce a 'shock' rate movement, there has been little to no literature on African central banks causality on media reportage; by far validating this study.

This paper employed Flesch-Kincaid Grade Level and Flesch Reading Ease Score textual analysis to SARB MPC statements and corresponding Mail and Guardian newspaper articles from January 2010 to January 2021. The study sought to examine the relationship between the SARB MPC statements and corresponding Mail and Guardian newspaper articles and examine the causality of SARB's MPC statements' Flesch-Kincaid Grade Level and Flesch Reading Ease Scores on Mail and Guardian's Flesch-Kincaid Grade Level and Flesch Reading Ease Scores. The study was able to illustrate relying on the Granger casualty test that although there appears to be a co-movement on the computation analysis, SARB's Flesch-Kincaid Grade Level and Flesch Reading Ease Scores has no Granger casualty on Mail and Guardian's Flesch-Kincaid Grade Level and Flesch Reading Ease Scores.

In so doing, the study was able to add to the only emerging literature on African central bank communication literature while offering a wide time frame given the ten-year span of MPC statements and corresponding

newspaper articles examined. This study paper contributed to the only emerging African central bank communication literature by firstly deploying the Flesch Reading Ease Score and the Flesch-Kincaid grade level index to 55 SARB MPC statements to gauge readability and hence SARB's clarity and subsequently testing for granger casualty using a casualty of SARB's MPC statements on Mail and Guardians' newspaper articles. In so doing adding to the only emerging literature on African central bank clarity and the interaction with the media.

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