Communication and Transparency through Central Bank Texts*

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January 1, 2020

Preliminary and incomplete.
Latest version available here.

Abstract

The policymaker financial stability toolkit recognizes central bank communication as an important tool. Communication efforts make market expectations of monetary policy decisions more accurate and stable. This paper studies the effect of central bank communication on monetary policy transparency. Using state-of-the-art text mining methodologies, the informational content from the interest rate decision statements, minutes, and governor's speeches published by the Fed, the ECB, the RBA, and the BoI from 1998 to 2018 is extracted. We construct a set of indicators to examine whether they can provide a clear signal about the future direction of monetary policy. We use basic text mining indicators to create a new transparency index measuring the central bank communication quality. We find that some sentiment measures improve the short-run predictability of the policy interest rate, the VIX, and upcoming monetary policy surprises.

Keywords: central bank communication, monetary policy transparency, text mining.

JEL Classification: C53, C55, E58.

*This paper does not necessarily reflect the views of the Bank of Israel, the Federal Reserve Bank of Richmond or the Federal Reserve System. We thank Itamar Caspi, Michel Strawczynski, and participants at the Bank of Israel research seminar for their useful comments.

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In recent decades, central banks have become increasingly more transparent about their decision- making process (Geraats, 2006). One of the reasons is an increased understanding of the role market expectations plays for monetary policy effectiveness. Central bank transparency influences the short-run dynamics of private-sector expectations (Blinder et al., 2008). This is because market interest rates do not necessarily react to changes in the short term policy rate. It is the expectations about the path of future policy actions that drive the determination of market interest rates.

In the literature, there is a clear consensus regarding the role and hierarchy of the instruments central banks use to control monetary policy. The policy rate is seen as playing the primary role, with communication generally seen in a supporting capacity (Blinder et al., 2008). However, the 2008 financial crisis incited a micro approach to financial regulation and supervision instead of the macro one. Policy speeches, conferences, and research papers discussing a macro perspective on financial regulation grown considerably grown (Galati and Moessner, 2013).

Although a central bank can directly influence only a very short-term interest rate, it also indirectly influences longer-term rates. Peculiarly, the changes in these long-term rates are often associated with releases of economic data or statements, even when there is no direct change in the target rate (Gürkaynak et al., 2005).

A bevy of evidence shows that what central banks say about their future goals and their economic outlook is sometimes more important than what they do directly, especially during economic volatility or when close to the Zero Lower Bound (ZLB), a conducive period for the use of forward guidance tools. As a lender of last resort, the central bank communicates with the public to prevent potential systemic risk situations. In a way, since policy expectations drive interest rates, central bank communication becomes a policy tool in itself.

How a central bank communicates with market players plays a crucial role in the evolution of market interest rates, and subsequently, the state of the economy (Woodford, 2001). For example, after the May 2013 speech by former Federal Reserve Chairman Ben Bernanke regarding the possibility that the Fed would be tapering its purchases of financial assets, many emerging economies experienced sharp capital flow reversals. This example provides insight into the importance of managing expectations in the execution of monetary policy (Feroli et al., 2014).

This increased understanding of the important role market expectations plays in the determination of market prices has led to a new definition of what constitutes a monetary policy tool. The use of some words at certain times is not only a part of monetary policy but is also a part of the central

bank's functions, including maintaining the financial stability and economic certainty that are essential to the business sector. Thus, central bank communication is deemed a critical—perhaps essential—instrument of central banking today.

In a comprehensive survey, Blinder et al. (2008) conclude that communication is a powerful part of the central bank's toolkit. Communication efforts make market expectations of monetary policy decisions more accurate (Heinemann and Ullrich, 2007; Rosa and Verga, 2007; Sturm and Haan, 2011).

Overall, central banks have also become remarkably more transparent in the last decade and are placing much greater weight on their communication. For instance, according to Federal Reserve Chairman Jerome Powell, to foster global financial stability and growth as the Fed raises rates, the Fed continues to help build resilience in the financial system and will communicate its policy strategy as clearly and transparently as possible to help align expectations and avoid market disruptions. Powell spoke about transparency as a tool to improve financial stability. A monetary policy surprise creates market noise and may harm financial stability. Transparency reduces this risk (Mankiw and Reis, 2018).

A monetary policy surprise operates along two main channels: the financial assets channel, where investors adjust their portfolio to the new reality immediately after the surprise, and the behavioral channel, where increasing uncertainty makes it more difficult to predict the future. The latter channel may undermine the level of confidence in economic decision-makers and future economic performance, thereby transitioning more investors into "bearish" behavior. However, central banks choose to launch a surprise as a policy tool in some cases.[1] In these cases, the potential adverse effects on financial stability should constitute a risk.

Over the years, the increasing attention to the harmful effects of the surprises led central banks to increase their transparency (Fig. 1). A high level of transparency allows the public to view the considerations underlying the decisions. Hence the public analyzes economic developments per these considerations to predict central bank policy better. Another element of transparency is the provision of clear forward guidance in the interest rate announcement. The higher the level of central bank transparency, the more likely the economic agents are to focus on and understand economic, geopolitical, and other developments, thereby reducing the level of uncertainty.

[1] A surprise affects inflation expectations in the short term but has a negligible effect in the long run.

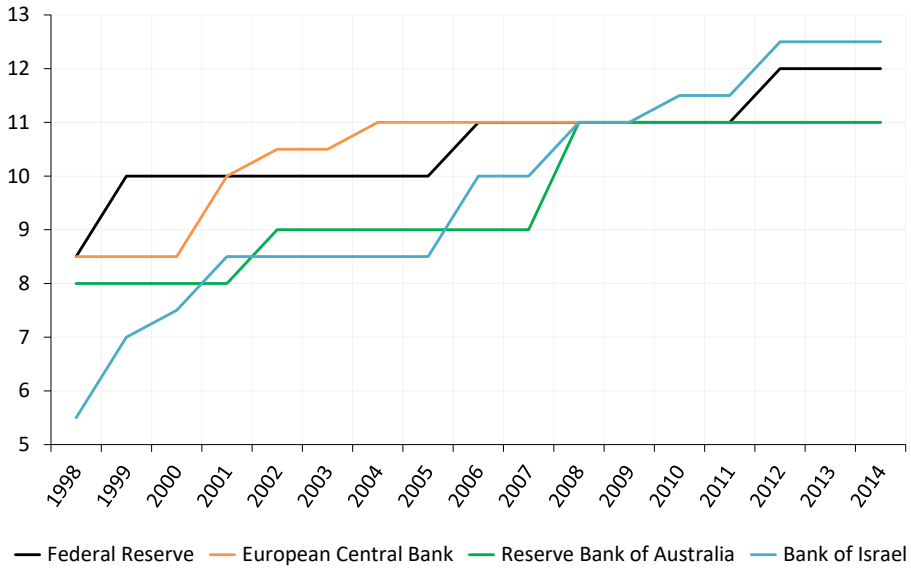

Figure 1: Central bank transparency according to Dincer and Eichengreen (2014).

Central bank communication is highly related to both financial stability management and transparency improvement, and can potentially be affected by credibility (Berger et al., 2011; Hayo and Neuenkirch, 2015). Given that central bank communication has emerged as an essential tool, there has been increasing interest in quantifying it (Gertler and Horvath, 2018). The ability to quantify central bank communication is particularly relevant to the study of financial stability, considering its ability to move financial markets (Brand et al., 2010), stabilize macroprudential risks (Born et al., 2011), and help predict future interest rates (Hayo and Neuenkirch, 2010; Jung, 2016). An important factor in macroprudential policy communication is how the macroprudential authority conveys messages to the public. One of the challenges in successfully using macroprudential tools is to convince the public of their necessity since the macroprudential instruments generally impose restrictions on the public or the financial system. Therefore, how macroprudential policy is explained is important to its success.

The usual method of measuring the level of central bank transparency is through the amount of the central bank's communication with the public. Accordingly, Dincer and Eichengreen (2008, 2014) developed a transparency index that takes values between 1 and 15, where 15 indicates the highest level of transparency. The index is calculated on an annual basis from informa-

tion gathered on central banks' websites, as well as statutes, annual reports, and other published documents. From a historical perspective, Dincer and Eichengreen (2008, 2014) show that central banks are working to increase transparency, indicating a growing awareness of its importance.

Dincer and Eichengreen (2008, 2014) base their transparency index on the amount of official communication conveyed to the public by the central bank. Questions about whether the content and its quality are sufficient to increase the public's understanding of the central bank's considerations are not given enough weight. The amount and length of the texts, as well as their readability or the sentiment they convey, are other measures correlated with the level of central bank transparency. Hence, Dincer and Eichengreen (2008, 2014) do not sufficiently reflect the degree of transparency of the central bank. We believe that the examination of transparency should include textual analysis, and we use various text mining techniques to examine the utility of central bank texts in predicting monetary policy decisions.

Although many central banks moved in the direction of greater transparency regarding their objectives, procedures, rationales, models, and data in recent years (Dincer and Eichengreen, 2008, 2014), not all central banks simplified their communication to the public. Such an improvement could gain the bank increased support and necessary trust to conduct monetary policy as mandated by the long-term objectives. Transparency improvement in developed economies robustly impacts inflation and economic agents' inflation expectations. Greater transparency reduces the persistence of inflation and minimizes the link between inflation and expectations (van der Cruijsen and Demertzis, 2007). We create a new indicator able to reflect the quality of the central bank's communication transparency, which should complement the more quantitative transparency index of Dincer and Eichengreen (2014).

In the past decade, various interdisciplinary tools have emerged and have been applied to the study of the central bank communication effect on policy outcomes. Recent advances in textual analysis and machine learning have sparked interest in applying those techniques to central bank publications.

Bholat et al. (2015) provide a comprehensive primer on how to apply text mining techniques to central bank documents, discussing both merits and problems of this approach. Bruno (2016, 2017) evaluates synthetic indices based on text analysis procedures, and finds them relevant for increasing the transparency of central banks' communications. Our paper contributes to this new and growing literature.

Despite the significant changes in both the sentence syntax and text structure of central bank communications (interest rate announcements, minutes and governor and deputy governor speeches), measuring and monitoring those communications enable us to assess several transparency traits. For

instance, text readability (or text complexity) indicators of texts related to central bank monetary policy measure the effectiveness (or ineffectiveness) of this channel, which, in turn, has an impact on the transmission of monetary policy to the economic agents.

Central banks signal their future intentions by using interest rate announcements, speeches, and minutes—all text-based communications. By publishing projections about the path of the target rate, (official) quantitative forward guidance is included in these texts. A natural extension and commitment to this are to publish a rule that produces these projections. However, perhaps because most central banks do not (exactly) follow a rule, they do not usually publish one. They also usually officially deny the real use of, or reliance on, policy rules during the interest rate decision process. Because of this, there is no analysis of how a policy rule performs as a communication instrument.

Our paper focuses on main inflation-targeting central bank text-based communications[2] to study whether they improve the short-run predictability of the policy interest rate. In other words, with the help of text mining, we study the extent to which central bank communication contributes to the notion of managing interest rate expectations. We use the central bank communications of four central banks: the Federal Reserve (Fed), the European Central Bank (ECB), the Reserve Bank of Australia (RBA), and the Bank of Israel (BoI). The Fed and the ECB are the two major central banks, while RBA and BoI represent two small open economy central banks. We extract the informational content from the corpus of interest rate decision statements (interest rate announcements and minutes), as well as the governor and deputy governor speeches, published by the central banks in the past twenty years, from late 1998 to 2018.

We analyze the content of this corpus with state-of-the-art text mining techniques to quantitatively assess the effect of communication on monetary policy transparency, defined as the ability of a central bank to explain current interest rate decisions and signal future ones, as well as some market interest rates. This assessment is based on several text analytics indicators to examine whether a given measure can provide a clear signal about the future direction of monetary policy. These various measures include sentiment, lexical diversity, text complexity, and several relative frequency measures.

[2]To date, text data from the Bank of Israel (BoI), the European Central Bank (ECB), the Sveriges Riksbank (SRB), the Bank of England (BoE), the Reserve Bank of New Zealand (RBNZ), the Reserve Bank of Australia (RBA), the Bank of Canada (BoC), the Czech National Bank (CNB), and the Federal Reserve (Fed) are collected. In this version, we will focus on the Fed and the ECB as our benchmark and the RBA and the BoI as small open economy central banks.

We show that dictionary-based sentiment measures of the interest rate announcements improve the short-run predictability of the policy interest rate. Interestingly, we show that uncertainty sentiment explains the VIX in the following periods and that the sentiment extracted from interest rate announcements explains upcoming monetary policy surprises.

Finally, we use some basic text mining indicators to create a central bank transparency quality index that should complement the Dincer and Eichengreen (2008, 2014) transparency (quantity) index in a useful way. As this new index appears to be roughly correlated with some Dincer and Eichengreen (2008, 2014) transparency indices, we conclude that transparency should be both qualitatively and quantitatively monitored to assess global central bank transparency objectively.

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