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Does communication influence executives' opinion of central bank policy?[*]

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Abstract

We analyze the economic impact of central banks sensed by business executives in a sample of 61 countries from 1998 to 2016. Based on a survey conducted by the Institute for Management Development (IMD), we find compelling evidence that intensive central bank communication worsens the perceived impact. During the global financial crisis (GFC), this effect became even stronger. In contrast, economic growth and a positive output gap improve the opinion executives have of their central bank's impact on the economy. Moreover, although less robustly, higher unemployment, and higher short-term interest rates worsen executives' opinion, while market uncertainty improves it. The level of inflation and an inflation targeting regime, central bank independence and transparency, financial crises, the zero lower bound constraint, forward guidance, the performance of the stock exchange, and the volatility of the exchange rate seem to be unimportant in this regard.

JEL Classification: E58, E52, D83, D80.
Keywords: Central bank communication, economic impact, perceived competence and trust in central banks, panel data, executive survey.

1 Introduction

We analyze the driving forces of business executives' opinion of their central bank's impact on economic development. In particular, we examine the role central bank communication and transparency play in this respect. This question has not been considered by previous studies and constitutes the major contribution to the literature we make in this paper. A good understanding of how the business community perceives central banks' economic policies adds an important dimension to the literature on central bank transparency and communication, which is focused on the relationship with financial markets. Next to communication and transparency, we account for the influence of an array of institutional, macroeconomic and financial variables.

An opinion of how a central bank influences the economy is related to trust and credibility. Trust can generally be defined as the perception by a principal that an agent will not cheat.[1] In the context of central banks, trust and credibility can be defined as an expectation or belief that the central bank, as the agent, will deliver on its stated goals to citizens as its principal.[2] However, while trust and credibility refer to the correspondence of expectations or beliefs with actual outcomes, a central bank's economic impact has a broader focus. It covers several potential interconnections between agents and their perception of central bank operations in the economy. A related dimension is whether the public deems its central bank competent. Arguably, the more competent it is perceived to be, the greater the positive impact on economic development it is believed to have. This view is akin to those expressed by Rogoff & Sibert (1988) and Rogoff (1990), where the more competent a government is, the less revenue it needs to provide a given level of government services. Another concept of competence has been defined by Dur (2001) as the probability that the policymaker designs an effective policy.[3]

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[1] See Knack (2001).

[2] See Ehrmann et al. (2013).

[3] In contrast, Frankel & Kartik (2018) equate greater central bank competence with more private information about policy objectives.

Assessing business executives' perception of the economic impact of their country's monetary institution is important for several reasons. First, a central bank considered to have a positive effect on the economy will enjoy support for its decisions necessary for fulfilling its basic functions. Second, a favorable opinion precedes the establishment of trust and credibility that, in turn, are the preconditions of monetary authorities' independence. After all, only an economically successful central bank will enjoy political and public support of its independence. Third, such a central bank will be more credible and hence more able to steer agents' expectations in line with its objective(s). Fourth, the knowledge of what determines how policymakers are perceived by the public allows them to identify the associated problems and assists them in taking adequate remedies.

We measure the economic impact of central banks as perceived by the international business community by the Executive Opinion Survey conducted by the International Institute for Management Development (IMD). The statement made in the survey is that "Central bank policy has a positive impact on economic development." The scale of answers is from 0 to 10, with higher values indicating stronger agreement with the statement. The set of countries covered by the survey has expanded since 1995 when it initially gathered data for 46 countries. We cover up to 61 countries over the period 1998–2016. These data have hardly been used in the literature on central banking.[4] We mainly use fixed effect panel regressions. To alleviate the endogeneity problem of macro variables, we lag all exogenous variables and use the two-stage least squares method and the GMM as robustness checks.

Our paper is related to three different strands of the literature. The first relates to central bank communication and transparency. Despite the respective body of literature being large and growing, Haldane (2017) points to three missing links when assessing the potential benefits of central bank communications. First, the vast majority of studies have focused on the ex-ante informational benefits of central bank transparency in terms of understanding. There is far less evidence as to their benefits

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[4] An exception is Hwang (2018).

for trust, or ex-post accountability. Second, studies have focused on the impact of central bank communications on markets rather than the general public. However, it is the general public that ultimately makes decisions about spending and saving and gives central banks their democratic legitimacy and independence. Third, when it comes to assessing the impact of central bank actions on the trust and understanding of the public, little if any attention has been paid to some of the richer informational channels through which news might spread between people.

The second strand of related literature examines the degree of trust the public puts in the respective country's institutions.

The third strand of literature considers surveys that pose direct questions to economic agents. This method has traditionally been regarded with some skepticism but has become more common during the preceding two decades.[5] Surveys may add important information on what underlies agents' decisions, thus enabling better interpretations of findings. For example, studies asking firms about their price-setting behavior generate valuable information on the frequency of price reviews and the sources of price rigidity. Surveys have also been used to investigate central banks' views on monetary policy, e.g., why credibility is considered important and what makes a central bank credible.[6] Others have used surveys of professionals' forecasts to study the impact of monetary policy.[7]

We contribute to all three strands. The use of an international survey of business executives allows us to focus on one important part of the general public that in previous studies has been widely neglected. In particular, it enables us to establish empirically what drives executives' opinion of the role their monetary authority plays in economic development, which constitutes a precondition to any trust-building process, and especially the role central bank communication plays in this respect.

Our analysis yields compelling evidence that more central bank communication wors-

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[5] See Apel et al. (2015).

[6] In an attempt to determine what factors affect a central bank's credibility, Blinder (2000) asked eighty-four central bank governors to rate the variables that made a central bank credible. Blinder et al. (2017) asked central bank governors and academic specialists whether the recent changes in monetary policy due to the financial crisis were likely to be temporary or permanent.

[7] See, e.g., Ehrmann et al. (2012), Lustenberger & Rossi (2017b), and Lustenberger & Rossi (2020).

ens respondents' opinion in general and that such effect was even more pronounced during the global financial crisis (GFC), while higher economic growth unambiguously improves it. Moreover, high unemployment and high levels of short-term interest rates damage managers' opinion. The noteworthy result is that more central bank communication harms managers' perception of the impact their central bank has on economic development. This result has, to our knowledge, never been shown before. Other tested variables turn out to be unimportant. This is notably the case for the level of inflation, the primary monetary policy objective, inflation targeting regimes, central bank independence and its transparency, which in theory and in practice are considered to be primordial for the success of central banks. Further dimensions with no appreciable effect are a forward guidance policy, the outbreak of a crisis, the zero lower bound constraint on short-term interest rates, and the performance of the stock exchange, as well as the level and variance of the exchange rate to the U.S. dollar.

The remainder of this paper is organized as follows. In **Section 2**, we discuss the related literature. In **Section 3**, we present the survey that serves us as the endogenous variable in the empirical analysis. In the following **Section 4**, we motivate the choice of exogenous variables. In **Section 5** and **Section 6**, we present our method and the results of a series of panel regressions, corroborated by robustness tests in **Section 7**. In **Section 8**, we interpret the results. Concluding remarks are presented in the following **Section 9**.

2   Literature

Our paper relates, on the one hand, to the literature on central bank transparency, and on the other hand, to studies of communication and trust in public institutions. Over the course of the past two decades, a broad empirical literature assessing the benefits of central bank transparency and communications has arisen. Most papers ask whether and how communications affect financial markets. In general, central bank announcements have been observed to be a significant source of information to which

financial markets react. A second line of research has assessed how communications affect professional forecasters. The evidence suggests that these communications have been crucial to forecasters' understanding of monetary policy, and contain information that can help predict future policy decisions. A third strand of research has looked at the role of the media in intermediating central bank messages, resulting in mixed evidence on how well the media performs this task. A fourth strand analyzes words and phrases used by central banks, using semantic modeling and other text-mining techniques.

Overall, this literature suggests that the increased transparency observed during the past two decades has delivered stabilization benefits, most notably for financial markets, inflation expectations, macroeconomic forecasts and, to some degree, media reporting.[8] However, Haldane & McMahon (2018) note that despite a rapid growth in central bank communication, the general public has largely remained a blind spot for these communications. One reason is that central banks have often not made their main communications accessible to a sufficiently wide audience. Using the Bank of England's Inflation Attitudes Survey, Haldane & McMahon (2018) constructed a monetary policy "knowledge index" among the general public. It suggests that the public's understanding of monetary policy structures has been largely immune to central banks' communication. Moreover, there is significant stratification in knowledge scores by age, education, and social class, with the young, less well-educated and poor being materially less knowledgeable. This implies that central banks' communications initiatives may be bypassing large cohorts of society.

The second strand of literature relevant to the question we pose is concerned with the process of trust building in monetary authorities. Fischer & Hahn (2008) studied the determinants of trust in the ECB from 1999 to 2004 by using aggregated annual data, observing that lower inflation and higher national income increased trust. Gros & Roth (2010) matched the aggregated semiannual Eurobarometer data on trust, aggregated to the country level, with macroeconomic data during the GFC. The authors'

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[8] See Haldane (2017).

findings implied that European citizens placed a heavy share of the blame on the ECB for the economic downturn caused by the GFC. There is far less evidence as to the benefits for trust, arising from transparency and communication. One exception is Van der Cruijsen & Eijffinger (2010), who reported on a survey of Dutch households, stating that trust in the ECB and perceived transparency were positively correlated.

These studies do not control for heterogeneity in trust among households with different characteristics, nor do they shed light on the mechanism underlying the trust-building process. Farvaque et al. (2017) rely also on the Eurobarometer survey data. The researchers report that the political orientation and education of individuals are important in the trust-building process. Being unemployed negatively impacts trust. Ehrmann et al. (2013) observe that at the country level and in the pre-crisis period, lower stock returns, higher inflation, and higher unemployment were negatively related to trust in the ECB, while measures of health of the financial system were insignificant. In addition, a decline in trust reflected a macroeconomic deterioration, a more generalized fall in the trust in European institutions in the wake of the crisis, and the severity of the banking sector's problems, with which the ECB was associated in the public opinion.

Bursian & Fürst (2015) provide further evidence on the drivers of trust in the ECB. The authors also report that the employment status is a central factor in explaining the variation in trust. While real GDP growth is important for the trust-building process, consumer price stability does not seem to matter. The ECB's performance with respect to its mandate is only relevant for the trust-building process if the subsample of people who have actually heard about the institution is considered. For Bursian & Fürst (2015), this highlights the predominant role of intensifying the ECB's communication. Hayo & Neuenkirch (2014) show that lack of knowledge is an important source of mistrust in central banks. According to Jost (2017), satisfaction with the Bank of England's policies increases with a better understanding of monetary policy. In the US, survey respondents with lower incomes or without a college degree are less likely

to understand monetary policy.[9]

Haldane (2017) reports that trust in institutions has generally declined over the past few years. The source of dwindling trust reflects a widening gap between trust in institutions among the elites (which has held firm) and among the general public (where it has fallen). In particular, trust or confidence in the Federal Reserve, the ECB, and the Bank of England has declined over the past decade, often coincident with the GFC. Using the Bank of England's Inflation Attitudes Survey, Haldane & McMahon (2018) also measured, as a proxy for trust, satisfaction with central banks' actions. This measure, similar to trust measures considered in other surveys, declined during and following the GFC and has yet to fully recover.

3   Endogenous Variable

We use the following survey item of the Executive Opinion Survey in the World Competitiveness Yearbook published by the IMD, a Switzerland-based international business school: "Central bank policy has a positive impact on economic development." Possible responses are 1 (Disagree), 2, 3, 4, 5 and 6 (Agree). The average of responses, rescaled to the range of $[0-10]$,[10] is used. Respondents of the survey are mid- and upper-level executives of international companies who have resided at least one year in the target country. To reflect the opinion of the entire business community, the IMD selects the sample size proportional to the GDP share of industry sectors of each country. For instance, in 2019 approximately 6,000 executives responded to the survey. As a result, the measure of a central bank's economic impact in 2019 was based on an average of 95 responses. As can be inferred from **Figure 1**, the average value (the thick red line) exhibits a gradual declining trend until 2016 with sharp drops occurring in 2001 and 2008, coinciding with the collapse of the "dotcom" bubble and the GFC.[11] Among various countries, during 1998-2019 the central banks of Chile (7.83), Singa-

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[9] See Carvalho & Nechio (2014), using the University of Michigan's Survey of Consumers.

[10] The transformation is as follows: ("average rating"$\times 2) - 2$.

[11] Trust in the ECB, measured by the Eurobarometer survey, exhibits a similar steep fall with the onset of economic crises, as evidenced by Ehrmann et al. (2013) and Bursian & Fürst (2015).

pore (7.81), Denmark (7.68), and Peru (7.53) received the highest scores on average, while those of Venezuela (1.99), Ukraine (3.52), Mongolia (3.66), and Argentina (4.8) earned the lowest ratings.

On the one hand, this survey has some limitations with respect to our research question. First, the sample size of respondents is relatively small. An evaluation by fewer than 100 business executives determines a central bank's score. Second, respondents may vary by year. An official attrition ratio is not calculated. However, it is estimated that approximately half of the respondents are new, while the other half are existing ones who have taken the survey at least once. Third, in the case of euro area countries, the survey question does not specify if the central bank is the ECB or the national central bank. This is not a major issue, however. First, it is more likely that respondents have in mind the ECB (which is responsible for monetary policy in the currency union) than the domestic central bank. Second, from an econometric point of view this will be alleviated by the use of country fixed effects.

On the other hand, the IMD survey provides information not available elsewhere. One major advantage that is particularly appropriate for addressing our research question is that it is directed to respondents with higher and comparable education levels for whom individual socioeconomic characteristics are less relevant. The problems associated with reaching the targeted audience with central bank communications are less likely to occur among the business managers' community than with the population as a whole. In particular, business executives are more amenable to demanding information. This is important, given the results in the literature on trust that suggest that trust and educational standards are positively related to each other. Another strength is that unlike typical surveys, this survey does not merely cover one country but instead stands out for its broad international coverage, encompassing countries all over the world at different stages of economic development and over a long period of time. Moreover, as the Appendix shows, survey results for all countries and over the entire sample period show no particular trends over time, and yet exhibit high cross-country variability (see **Figure 1**), which makes the chosen survey item a perfect variable for

our panel analysis.
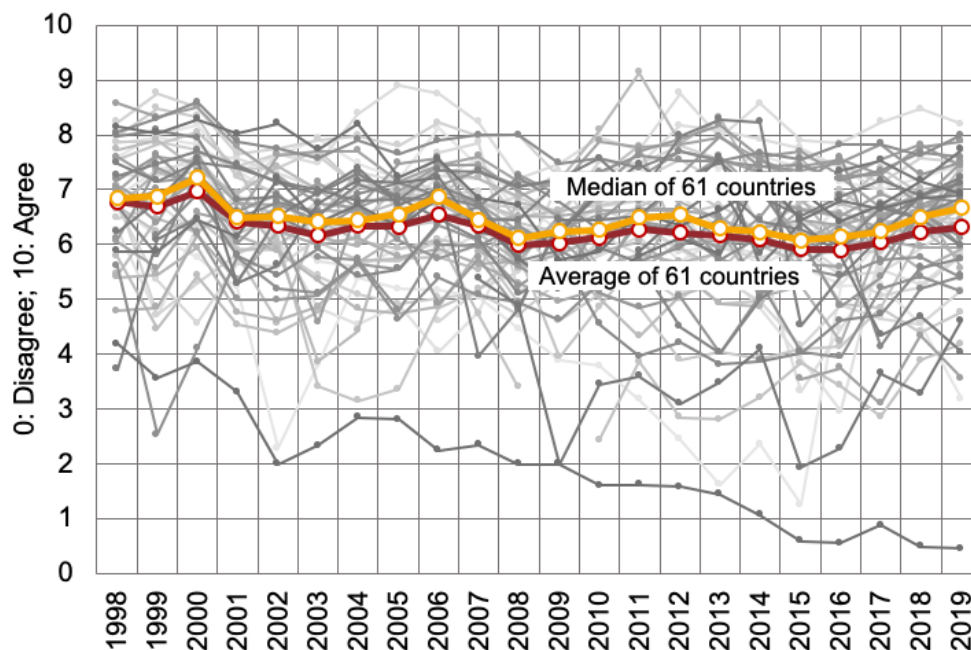
Figure 1: IMD Survey: "Central bank policy has a positive impact on economic development."

Notes: The IMD survey collects responses by business managers to the statement "Central bank policy has a positive impact on economic development." A value of 10 means "agree", while 0 indicates that the respondent "disagrees" with the statement. Each grey line represents a country's average values over time. The orange line shows the cross-country median, and the red line shows the cross-country average of 61 countries in our sample.

To corroborate its adequacy for tackling our research question, **Figure 2** compares the IMD results with those obtained from large surveys of public confidence in central banks carried out at the country level, or, in case of the Eurobarometer, across the euro area. The general observation is that the IMD measure is not systematically different from well-known surveys. The first (left) panel of **Figure 2** compares the IMD results for the UK with the public satisfaction measure for the Bank of England (BOE). The net satisfaction measure (proportion of those satisfied less that of those dissatisfied) is based on the question "Overall, how satisfied or dissatisfied are you with the way the Bank of England is doing its job to set interest rates in order to control inflation?" ($N > 2,000$). Although there are differences between the IMD survey and the BOE survey in terms of the question posed, respondents (executives vs. the general public), and sample size (95 vs. 2,000), the results do not suggest a systematic difference. The second (right) panel compares the IMD survey with the confidence measure for the Swedish Riksbank based on the question "How much confidence

do you have in the way in which the Riksbank manages its work?" ($N > 1,300$). Again, the two surveys exhibit similar trends. This holds also for the comparison of the IMD's survey with the large surveys of public confidence in the Bank of Japan (BOJ) and the Federal Reserve Board (FRB), which are plotted in the third and fourth panels. Finally, the comparison with the results for trust in the ECB for 12 euro area founding member countries assessed by the Eurobarometer reveals that they are only moderately correlated, especially before 2002. The two measures are correlated but not identical. While the IMD survey refers to the economic impact of central bank policies, the Eurobarometer's survey concerns the general trust in the ECB, which could be influenced by respondents' attitude to the EU or their personal inclination with respect to trust in general.

From these comparisons, we conclude that, overall, the IMD survey covers some of the dimensions captured by country surveys but, ultimately, contains additional insights that highlight its multidimensionality referred to in the previous section. To account for its multidimensionality, we next discuss an array of possible variables that may be related to it.
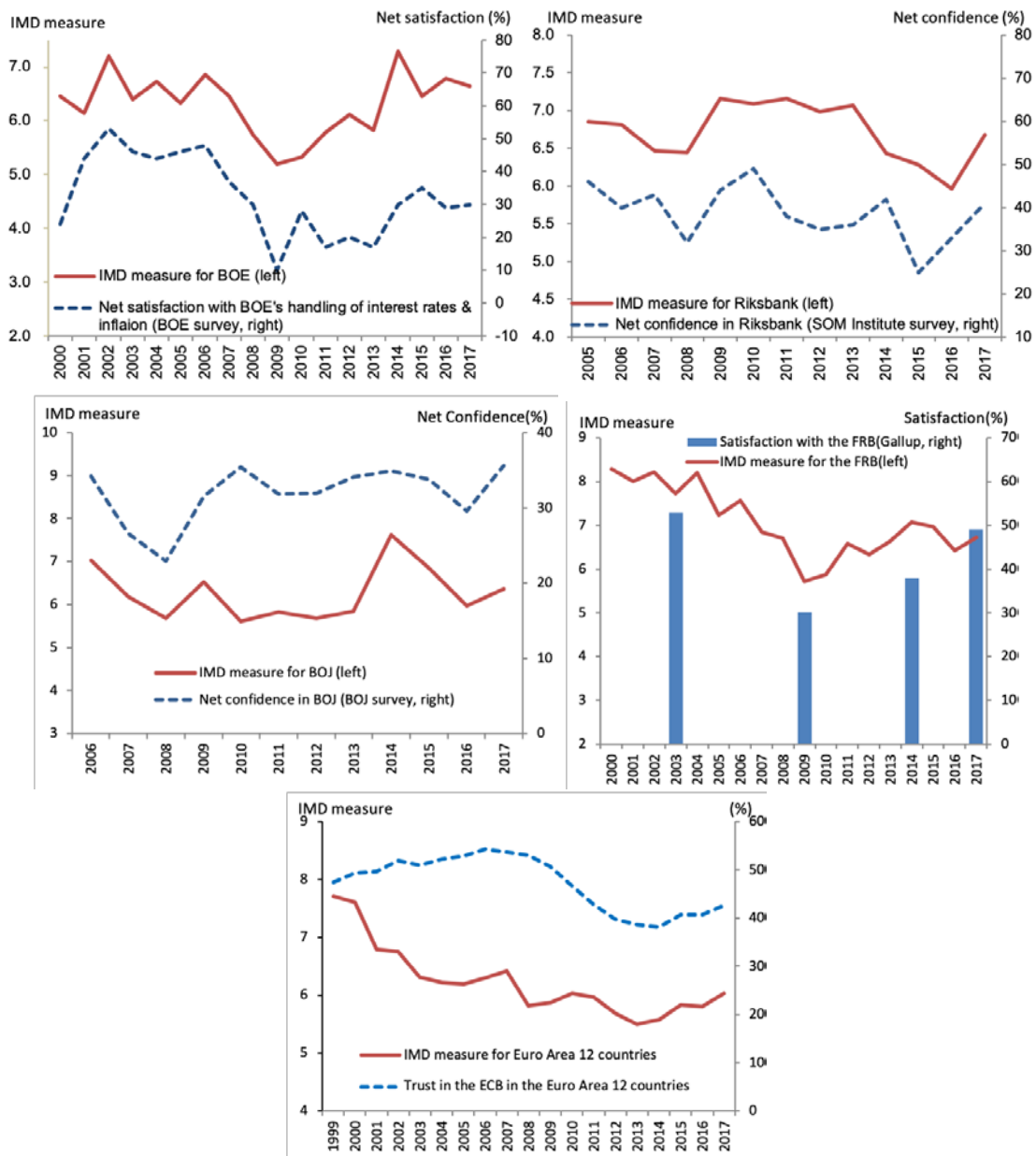
Figure 2: IMD Survey vs. other central bank trust measures

Notes: The IMD survey asks about opinions on the statement "Central bank policy has a positive impact on economic development."

The Bank of England (BOE) survey (the Inflation Attitudes Survey) asks "How satisfied or dissatisfied are you with the way the BOE is doing its job to set interest rates in order to control inflation?".

The SOM Institute's survey on the Swedish Riksbank poses the question "How much confidence do you have in the way in which the Riksbank manages its work?" (the net confidence is computed as the proportion of high confidence less that of little confidence).

The Bank of Japan (BOJ) survey (Opinion Survey, June survey, Recognition and Credibility Section, $N = 4,000$) asks "How would you describe your level of confidence in the Bank?" (the net confidence is computed as the proportion of (somewhat) confident less than of not (particularly) confident).

The Gallup poll on the Federal Reserve Board (FRB, Gallup Trend, ratings of government agencies, $N = 1,000$) entails the question "How would you rate the job being done by the FRB?" (the satisfaction ratio is taken to be the proportion of 'excellent' and 'good').

Trust in the ECB represents the share of population answering "Tend to trust" to the question "Please tell me if you tend to trust the ECB or tend not to trust it" in the Eurobarometer survey (N = more than 1,000 for each country).

4 Explanatory Variables

In this section, we motivate the choice of variables that may potentially influence the way business managers discern the importance of their central bank in promoting economic development. We start with the primary goals assigned to central banks, and subsequently consider their degree of independence, their transparency levels as well as their communication intensity, and the introduction of an inflation-targeting regime. We also account for the occurrence of various types of crises, the constraint on nominal interest rates once they have reached their lower bound as well as unconventional monetary policies that have been pursued in the wake of such an occurrence. The remaining variables capture potential effects of public debt, stock markets and exchange rates.[12]

4.1 Price Stability

Given the generally accepted view that "Inflation is always and everywhere a monetary phenomenon" and the notion that inflation above a certain threshold is detrimental to the real economy (Driffill et al. (1990)), both theory and evidence suggest that monetary policy should focus on promoting price stability in the long run.[13] Nowadays, in accordance with this consensus, price stability as measured by (some forms of) the CPI is the major monetary policy objective in most countries.

Hence, the first variable with a potential to influence business peoples' opinion of central bank policies is CPI inflation.

4.2 Inflation Expectations

Public expectations about inflation constitute one of the key factors that determine actual inflation. A central bank is more likely to be successful in achieving low and stable inflation if it can anchor agents' long-term inflation expectations close to its in-

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[12] The Appendix provides the details on the data.
[13] See, e.g., Mishkin (2000).

flation objective.[14] Most importantly, inflation expectations are yardsticks in assessing the credibility of a central bank in meeting its inflation objective, which is typically measured by the difference between medium-/long-term public expectations regarding the bank's target and the target itself.[15] Another critical aspect in this context is that persistent deviations between published policy intentions and market expectations may raise questions about central bank credibility or induce excessive sensitivity to market perceptions.[16]

While inflation forecast errors may be a proxy for central bank credibility, we ask whether professionals' errors in predicting future inflation impinge on how business leaders perceive their central bank policy's effect on the economy. The measure of expected inflation corresponds to the forecast errors made by professional forecasters provided by Consensus Economics. We thereby implicitly assume that executives' forecast errors are similar to those of professional forecasters.

4.3   Real Variables

Since real-world outcomes are what matter to people, it is tempting to argue that the central bank should also have a real long-run target. However, there is a widely established consensus that there is no permanent trade-off between inflation and real activity. This leaves open the question of whether in the short run a central bank should focus solely on price stability or have a dual mandate, under which it also has to consider some measure of real activity. Because social welfare likely depends at least as much on people having jobs as it does on inflation, there is a strong argument for including some measure of real activity, such as output or (un)employment, in a central bank's objective function.[17]

We will use three variables related to the real side of the economy: the GDP growth, a measure of the output gap, and the official unemployment rate.

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[14] See Laubach et al. (2001).
[15] Svensson (1993), Bordo & Siklos (2017).
[16] Shin (2017).
[17] Friedman (1995).

4.4 Financial Stability

A more contentious debate is about whether a central bank should also care about financial stability. Blinder (2010) argues that an often forgotten issue in specifying central banks' loss functions is that every central bank has either statutory or tacit responsibility for maintaining financial stability. At certain critical times, this objective takes precedence over everything else. Systemic banking crises are highly disruptive events that lead to sustained declines in economic activity, financial intermediation, and ultimately welfare. Empirical studies assessing the real-world consequences of banking crises have highlighted profound and persistent declines in output and employment.[18]

To examine whether business managers' view of their central banks' effect on the economy suffers from financial crises, we constructed a dummy variable based on the dataset provided by Laeven & Valencia (2018). It includes information on crisis dates, policy responses adopted to resolve banking crises, and the fiscal and output costs of crises. We considered all types of reported crises, i.e., banking, currency and sovereign crises.

4.5 Central Bank Independence

A remarkable result in economics is that even if policymakers have the same goals and information as private agents, and even if they exercise their judgment to do what seems best, they may end up with inferior outcomes.[19] The reason is that even if policymakers have no initial desire to mislead private agents, after they have made their choices, the policymakers' incentives change, prompting them to implement a policy different from the announced one. If agents anticipate this behavior, society may end up worse off with an inflation rate higher than the one that is socially desirable and without a reduction in unemployment. Tying policymakers' hands may then improve welfare.

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[18] See, e.g., Reinhart & Rogoff (2009), Jordà et al. (2015), Cerra & Saxena (2017), Romer & Romer (2018) and Laeven & Valencia (2018).

[19] See Kydland & Prescott (1977) and Barro & Gordon (1983).

For Rogoff (2019), the most important institutional development of our time in macroeconomic policy is the rise of independent central banks. Since the late 1980s, central bank independence (CBI) has become the key institutional recipe for fighting inflation, and has inspired a wave of reforms around the world.[20] According to a survey, between 1985 and 2012 there were 266 reforms of the statutory independence of central banks that mostly strengthened it.[21] In spite of the broad impact this policy advice has had, the empirical evidence backing it is still controversial.[22]

While the literature has focused on whether CBI helps overcome the inflationary bias from time inconsistency by enhancing credibility and trust, the question we pose is whether CBI is regarded as affecting central banks' perceived economic impact. One important difference is between legal and de facto CBI. Legal independence does not guarantee de facto independence, and the relationship between de jure CBI and inflation outcomes is not always clear-cut (Cukierman (2008)). In reality, CBI is fragile, and is something that has to be earned every day. However, statutory reforms towards increased CBI are a policy statement, and represent a desire to untie the central bank and the government. In the practice of monetary reforms, de jure CBI is often a prerequisite for de facto CBI and more broadly for a successful monetary reform.[23]

We consider four different CBI indices, namely, three de jure CBI indices as a measure of policy intent and one that attempts to capture de facto CBI. The first is by Dincer & Eichengreen (2014), who have compiled an extensive CBI dataset. While the researchers' dataset has a rich cross-country dimension (100 countries), its time series is from 1998 till 2010, and hence too short to cover our entire sample period underlying the IMD surveys. The second index is by Garriga (2016), and includes yearly data from 182 countries between 1970 and 2012. The third, by Masciandaro & Romelli (2018), covers 65 countries over the period of 1972-2014. As to the measure of the facto CBI, we use the updated index provided by Dreher et al. (2010) that considers

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[20] See Kern et al. (2019).

[21] See Garriga (2016).

[22] Recent studies, e.g., Baumann, Rossi & Volkmann (2020) and the references therein, as well as Baumann, Schomaker & Rossi (2020) observe weak evidence, if any, of CBI affecting inflation.

[23] Ötker & Freedman (2010).

the turnover rate of central banks' governors.

4.6 Transparency

Nowadays, the conventional wisdom – with a sizeable scholarly literature corroborating it – is that independent central banks should be transparent. Transparency requires that central banks communicate with the outside world. Transparency includes several dimensions, such as publishing an inflation report, releasing policy statements, holding press conferences immediately after decisions are made, publishing expected short-term interest rates, releasing the minutes of policy assessments, etc.

There are two main reasons to favor transparency. The first is that it may confer ex-ante benefits arising from improved understanding, helping stabilize the economy. This is the benefit on which economists often focus. Greater openness enhances the effectiveness of monetary policymaking by tightening the gears between actions and market expectations.[24] The second reason is that there is a prima facie argument for public institutions to be open in order to be democratically legitimate. An additional benefit of transparency is that it may represent a kind of rule. Friedman (1995) recommended strict rules for guiding monetary policy because the author thought that deviating from such rules added noise into the system, leading to inefficient fluctuations in inflation and the real economy. Central banks have continued to use a great deal of discretion in reacting to shocks but have responded to academics and politicians by placing a large emphasis on transparency in an attempt to reduce the noise arising from banks' actions.[25] As a result, we can observe a global trend towards greater openness in central banking over the past 20 years.[26]

Research suggests that transparency enhances the effectiveness of monetary policy, although the evidence is not clear-cut.[27] In fact, little is known about the public's

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[24] Sibert (2009).

[25] Mankiw & Reis (2018).

[26] Dincer & Eichengreen (2014).

[27] See Van der Cruijsen & Eijffinger (2010), Lustenberger & Rossi (2020), and Baumann, Rossi & Volkmann (2020).

knowledge of monetary policy, how relevant information reaches it, and how this information contributes to knowledge. More importantly, there is no clear understanding of whether knowledge of monetary policy is relevant for the public's decision-making. Kril et al. (2016) report that trust in the Bank of Israel's policy is associated with its professionalism and independence and not with its transparency.

The literature offers few objections to giving the central bank a general mandate to be as transparent as possible, while leaving policymakers some discretion in the implementation of this mandate.[28] Since virtually all central banks have been moving toward greater openness, Blinder (2018) predicts that this process will go on. However, when transparency becomes excessive, it may backfire as the public will be overloaded with information. By being overly transparent, the central bank might fulfill formal requests for transparency while violating the principles of clarity and honesty (Issing (2019)).

We proxy transparency by the updated index of Dincer et al. (2019), which is available from 1998 to 2015.

4.7   Inflation Targeting

An inflation-targeting regime is a monetary policy strategy deemed to provide a disciplined framework in the form of a commitment device that helps improve monetary policy transparency by announcing the central bank's projections for the variables in its objective function as clearly as possible. Arguably, as a result of an explicit inflation target, actual inflation rates have decreased, and so has the persistence of their movements away from trend.[29]

Several studies have challenged the success of inflation targeting by arguing that its adoption is endogenous.[30] Others examine the conditions under which inflation may not be well-anchored under an inflation-targeting regime. Lustenberger & Rossi (2020) find no clear evidence that inflation targeting improves inflation forecasts, and

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[28] Blinder (2006).
[29] See Kose et al. (2019).
[30] See Ball & Sheridan (2004) and Kim & Yim (2016).

Baumann, Rossi & Volkmann (2020) reach the same result for its effect on inflation. Posen (2019) argues that inflation targeting is less well-founded than it appeared to be pre-crisis. According to the researcher, transparency and some discipline short of rules seem to be all that is needed to achieve low inflation. Furthermore, the emphasis on anchoring of inflation expectations is misplaced and misleading, and real side factors, including international trends and wage bargaining power, would do more to determine outcomes.

In view of this controversy, we are interested in how or whether an official inflation target or a deviation from it influences the opinion of a central bank's ability to boost the economy. To answer this question, we construct three variables. The first is a dummy variable that is equal to 1 for countries with an inflation-targeting regime, and is 0 otherwise. The second variable measures the deviation of forecast inflation from the target. The third measures more generally the deviation of forecast inflation from an annual target of 2%, the target most central bankers pursue (Mishkin (2017)).

4.8   Communication

Lustenberger & Rossi (2020) introduce an important distinction between transparency and communication. While transparency aims at the fundamental elements deemed to be in effect over the medium to long term, communication entails addressing current policy issues by means of speeches. Lustenberger & Rossi (2020) report a strong increase in the number of speeches given by central bank officials over the preceding two decades. Central bank communication can be valuable to economic agents because of the information about the economy that such communication provides, and because it can justify current policy and reveal likely future policies. In addition, it may improve the general understanding of monetary policy.[31] Blinder et al. (2017) hypothesize that central banks in the future will have broader mandates, use macro-prudential tools more widely, and communicate more than before the crisis. However, there are some concerns arising from intensified communication. One is

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[31] See Van der Cruijsen et al. (2015).

that it may foster confusion rather than better understanding. Publishing an almost unlimited amount of information may not ensure that this information reaches the recipient, as the recipient's ability to process information might be limited.[32] It is difficult to give the public all information in a way that is not only exhaustive but also clear and comprehensible.[33]

A few studies use models where agents have cognitive or informational limitations that can lead them to misinterpret public information. If the central bank reveals signals about the state variables that agents use to make decisions but does so in a manner that buries the information in statistical noise, or if the bank announces the information too soon before it becomes relevant, or if it focuses on variables that are too far from the policy targets, then it is possible to lower the precision of private actions and achieve worse outcomes.[34] Moreover, public signals may lead agents to collect less private information, making the price system less efficient and inducing an overreaction of expectations to noisy public signals. Morris & Shin (2002) argue that noisy central bank communications can worsen the understanding of monetary policy if they cause expectations to converge away from fundamentals. Kool et al. (2011) show how even precise communication could worsen outcomes if it leads the private sector to reduce investment in information. However, while researchers have developed theoretical arguments as to why having less information might raise welfare in a model, they have not convincingly shown that these effects are likely to be present in reality (Roca (2010)), quantitatively important (Svensson (2006)), empirically significant (Crowe (2010)), or be country-dependent (Lustenberger & Rossi (2017b)).

Another potential problem associated with central bank communications is that most countries have not a single person but a committee of several people making policy decisions. A monetary policy committee (MPC) has several advantages, namely, a reduced likelihood of adopting extreme or idiosyncratic positions, and producing less

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[32] See Shannon (1948).
[33] See Issing (2005).
[34] Eusepi & Preston (2010) and Gaballo (2016).

volatile decisions due to "averaging" (Blinder (2004)). For these potential virtues to be realized, the MPC members need to share a common framework to communicate effectively and to reach an agreement.[35] Sibert (2006) pointed to a possible downside of group decision-making that might devolve into "groupthink". Another potential problem of MPCs is that having many actors poses challenges for communication. Any organization with multiple decision-makers is bound to encounter disagreements now and then. Additionally, when the macroeconomic or financial backdrop of monetary policy is complex or ambiguous, such disagreements are apt to be common. Having many voices raises the danger of confusing a disagreement with uncertainty. It may make it more difficult for agents to coordinate on the public signals provided by policymakers.

Some researchers have suggested that to aid coordination, the central bank could hold fewer speeches that would be more precise and targeted at different groups in the population.[36] Lustenberger & Rossi (2020) have recently provided empirical evidence that more communication increases professional forecasters' errors in predicting economic variables and widens forecasts' dispersion. Lustenberger & Rossi (2020) interpret these findings as communication leading to cacophony, perhaps resulting from MPC members making inconsistent statements. Similarly, Armelius et al. (2019) show that central bank communication contains systematic biases that could lead to suboptimal policy outcomes.

The existing literature has mostly equated the outside world with financial market participants. Blinder et al. (2008), p. 941 pointed out that "it may be time to pay some attention to communication with the general public." This is certainly true and consistent with many economic models that presume that central bank communication is aimed at wage-setters, price-setters, consumers, or investors. Yet, a question remains: are they listening? Kumar et al. (2015) studied results of surveys from 2013 to 2015 of inflation expectations and knowledge of monetary policy among business managers in New Zealand, concluding that business managers were not being informed.

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[35] Charness & Sutter (2012).

[36] See Morris & Shin (2007), Chahrour (2014), and Myatt & Wallace (2014).

Managers seemed to pay little attention to the central bank, and inflation expectations were not anchored around the target.[37] Similarly, there is evidence that professionals indeed closely follow central bank communication, but its impact on households and firms seems to be limited. Even when an initial effect can be identified, it tends to disappear within six months.[38]

The evidence reported by Kumar et al. (2015) is particularly interesting in our context. We extend the research question along three dimensions. We consider business executives' opinions in relation to a variety of potentially influencing forces, enlarge the coverage of respondents to an international audience, and analyze their responses over two decades.

Following Lustenberger & Rossi (2020), we proxy central bank communication by compiling a dataset of the number of speeches given by central bankers. The dataset is based on the BIS database of central bankers' speeches, available since 1997. It is a unique proxy for the intensity of central bank communication, the coverage of which has increasingly become more complete over time. Most importantly, as explained in Lustenberger & Rossi (2020), there is no potential endogeneity problem associated with this communication measure. Central bank speeches are announced months in advance. Therefore, the number of speeches is fixed, making it a well-defined exogenous variable. We cannot exclude the possibility that some of the speeches were the result of unexpected events that the central bank considered important enough to justify intervention. However, for most speeches, this is very unlikely.

Figure 3 plots the number of speeches delivered by all central banks in our sample during the period of 1997–2018. As the figure suggests, central banks began to intensify their speaking activities before the GFC. We further observe that central banks do not hold more speeches at particular times, such as during recessions (measured by NBER business cycle dating) or periods of heightened uncertainty (measured by the VIX).

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[37] These results challenge the view that inflation targeting anchors price-setters' inflation expectations since New Zealand is the country with the longest and best-established history of inflation targeting.

[38] Coibion et al. (2019).
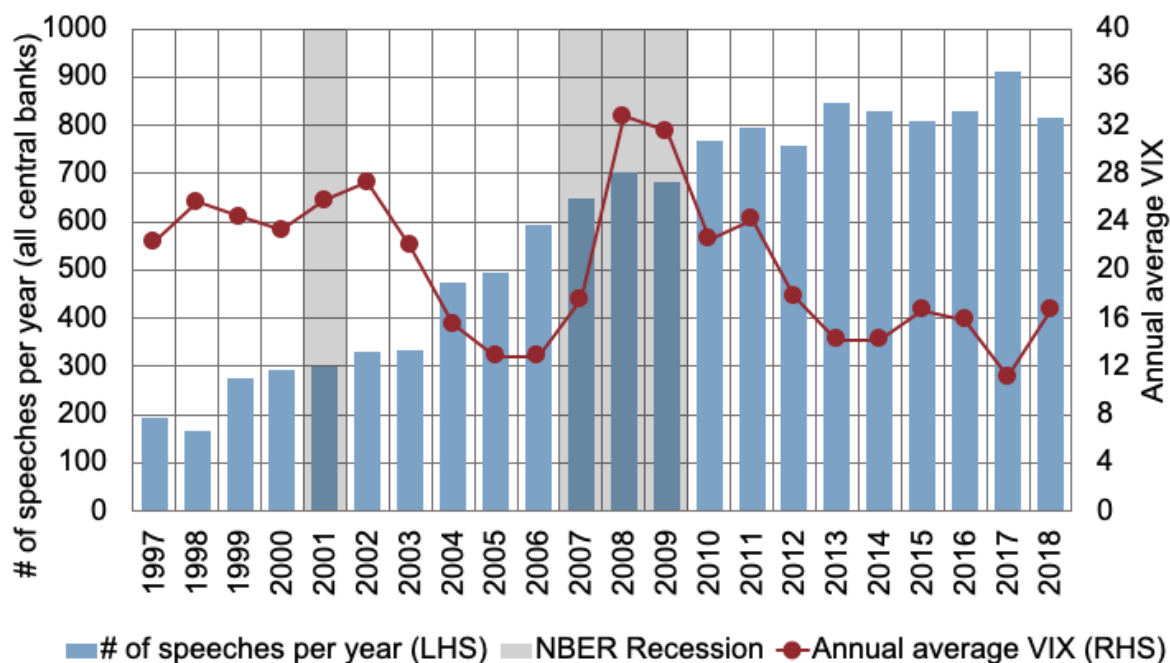
Figure 3: Number of speeches per year (all central banks) and uncertainty

4.9 Interest Rates

One of the mechanisms through which monetary policy affects the economy is through interest rates. This transmission has been a standard feature in the economics literature for over 50 years.[39] Modern macroeconomics textbooks typically suggest that there is an inverse relationship between interest rates and business investment. Changes in real interest rates affect businesses' fixed investment, residential housing investment, consumers' durable goods expenditure and inventory investment. In the textbook description, this inverse relationship is essential to understanding how changes in monetary policy affect the economy. However, empirical studies have had great difficulty in identifying quantitatively important effects of the interest rate channel. The conclusion from empirical studies has been supported by surveys of businesses reporting that their investment decisions were unaffected by changes in the cost of borrowing.[40]

We proxy the interest rate channel by a short-term interest rate.

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[39] Mishkin (1995).

[40] Sharpe & Suarez (2015) and Lane & Rosewall (2015).

4.10 Unconventional Monetary Policy

When a sufficiently negative shock hits the economy, requiring a negative policy rate to stimulate the economy, conventional monetary policy becomes ineffective because policy interest rates cannot be driven significantly below zero. This has become known as the zero-lower-bound (ZLB) problem. Before the GFC, economists believed that even if the ZLB constraint was reached, monetary policy tools would still be effective with the use of nonconventional monetary policy tools to provide sufficient stimulus to the economy.[41] Unconventional monetary policy tools are large-scale asset purchases known as quantitative easing (QE) and used to lower risk and term premiums, forward guidance about the future policy rate so that it would be viewed as staying low for an extended period, and exchange rate interventions to lower the value of the domestic currency or to prevent its uncontrolled appreciation.

The unconventional monetary policy measures adopted to weather the GFC may have affected the perceived belief in the central banks' ability to affect the economy, although it is unclear in which way. On the one hand, they may have benefited the trust-building process and perceived impact by stabilizing or even fostering good macroeconomic conditions. On the other hand, they may have worsened the perception (and credibility) of central banks if the impression arises that they have reached their limits. Hence, a systematic investigation of how unconventional policy measures are perceived by managers may be called for.

4.10.1 Zero Lower Bound

To account for the ZLB's impact on the managers' opinion, we construct a dummy variable that is 0 for interest rates higher than 0.5% and is 1 for interest rates below 0.5%.

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[41] See, e.g., Svensson (2001) and Bernanke (2004).

4.10.2 Quantitative Easing

Mishkin (2017) argues that the ZLB constraint has become of much greater relevance to central banks than was anticipated before the GFC. While early event studies seemed to imply that QE (essentially, central bank purchases of long-term government bonds) can have significant stimulus effects by pushing down long-term interest rates, over time it became clear that most of the action in long-term interest rates stemmed from a trend of a decline that had little to do with QE. Initially optimistic assessments have now been sharply tempered. Similarly, Rogoff (2019) points out that central banks face challenges today that arise from their ineffectiveness in finding ways to deal with the ZLB.

We proxy QE by the growth rate in the monetary base.

4.10.3 Forward Guidance

Traditionally, greater communication was seen as a way to tighten the link between the overnight nominal interest rate and the medium- and long-term interest rates that matter for saving and investment decisions.[42] The idea was to use central bank communication to move the entire yield curve up or down. When short rates hit the ZLB, such movement becomes impossible. In such a case, forward guidance about keeping short-term interest rates low for a prolonged period of time may provide the required policy easing by pulling medium- and long-term interest rates down.[43] However, the initial enthusiasm with respect to forward guidance's effectiveness appears to have faded away.[44]

To capture the forward guidance policy, we construct a dummy variable based on Charbonneau & Rennison (2015).

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[42] Bernanke (2004).

[43] Blinder (2018). In fact, using forward guidance to reduce long-term interest rates immediately is one of the few effective tools left for the central bank to stimulate the aggregate demand. See Eggertsson et al. (2003). Moessner et al. (2017) provide a review.

[44] See Issing (2019).

4.11 Public Debt

One lesson from the "unpleasant monetarist arithmetic" discussed in Sargent & Wallace (1981) and the literature on fiscal theories of the price level is that without long-run fiscal sustainability, no central bank will be able to keep inflation low and stable.[45] Restraining the fiscal authorities from engaging in excessive deficit financing makes it easier for the monetary authorities to keep inflation under control. The bottom line is that no matter how strong the commitment of a central bank to price stability is, fiscal dominance can override it.

We measure government debt by the ratio of the central government's debt to GDP.

4.12 Stock Exchange

Consistently with Ehrmann et al. (2013), we also account for the effect of country stock returns. The hypothesis is that a well-performing stock market may be attributable, at least in part, to the central bank's successful steering of the economy.

Stock market performance is measured by annual averages of countries' stock market indices provided by MSCI.

4.13 Exchange Rate Volatility

Exchange rate volatility may have the potential to strongly affect executives' view on central banks' competence. Volatile exchange rates hurt the economy for several reasons. By increasing uncertainty about future consumption and firm revenues, they reduce welfare (Obstfeld & Rogoff (2003)). Empirical results reveal that higher exchange rate volatility increases the risk of domestic investment (Byrne & Davis (2005)) as well as foreign direct investment (Urata & Kawai (2000)). Several studies also observe a negative impact of higher exchange rate volatility on exports since more volatile exchange rates make export revenues uncertain (Arize et al. (2008)). Exchange rate volatility also increases the home bias in portfolio investment (Mishra (2011)) and

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[45] The relation between politics and, in particular, fiscal policy and CBI has been discussed extensively. See de Haan & Eijffinger (2016) and Baumann, Rossi & Volkmann (2020).

presents an obstacle to consumption risk sharing. Moreover, it reduces economic growth, particularly for less developed economies, by exacerbating the adverse effect of credit constraints on domestic investment (Aghion et al. (2009)).

We proxy the effect of exchange rates by the variance of the domestic exchange rate to USD and consider the variance of monthly foreign exchange rates over one year divided by the average rate over the same period.

4.14 Market Uncertainty

Various authors have documented a decline in trust in central banks in recent years. Against this background, we examine business managers' perception of their central bank's economic impact in relation to global uncertainty. To this end, we use the Chicago Board Options Exchange Volatility Index (VIX) as a general measure of uncertainty in financial markets.

5 Regression Analysis

We run panel regressions with country fixed effects of the form

$$Y_{i,t} = \alpha + \nu_i + T_t + \beta \cdot X_{i,t-1} + \varepsilon_{i,t} \tag{1}$$

where $Y_{i,t}$ contains the IMD survey results of country i in year t, and $X_{i,t-1}$ consists of the lagged exogenous variables.

It is reasonable to assume that business managers' views do not respond contemporaneously to changes in the covariates; instead, managers are more likely to base their opinions on their experience in the recent past. This could lead to an endogeneity problem that might arise because of simultaneously perceived economic impact of central banks and the right-hand variables, e.g., contemporaneous real GDP growth. Studies show that trust plays an important role in determining a country's economic growth. Knack & Keefer (1997) and Zak & Knack (2001) show that higher prevailing

trust has a positive impact on growth. To alleviate reverse causality and a bias resulting from simultaneity, we lag all explanatory variables by one year ($t-1$) since the IMD survey is conducted in the first quarter of each year. Therefore, e.g., the real GDP growth of the previous year is a more plausible choice of variable than the growth in the current year to affect survey results of the current year.

Variable α is the intercept, and ν_i corresponds to the country fixed effect that controls for unobservable country-specific effects. T_t is a yearly fixed effect used to capture a potential temporal trend. We use panel clustered standard errors, clustered around countries. Such errors have three advantages: they correct for potential correlation of the IMD Survey results over the years, take heteroskedasticity into account, and deliver consistent variance estimates.[46]

Due to data availability, we cover the period from 1998 to 2016, including up to 61 countries. **Table 15** in the Appendix summarizes the countries in our sample.

6   Results

This section is divided into two subsections. In the first, we present our results based on the entire set of observations. The second subsection focuses on the effects since the outbreak of the GFC.

6.1   Results for the whole period

Table 1 and **Table 2** summarize the results of fixed-effects estimations based on observations over the entire sample period. **Table 1** focuses on macroeconomic and institutional variables, and **Table 2** on financial variables. As can be deduced from the tables, four variables exert a significant effect: central bank communication (Speech), real GDP growth (Growth), the rate of unemployment, and market uncertainty (VIX). More frequent central bank communication and higher unemployment harm business managers' opinion of central banks' economic impact, while higher output growth

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[46] See Stock & Watson (2008).

and uncertainty improve it. The results for the level of short-term interest rates (Interest Level) are less robust, but the coefficients' signs are negative throughout, i.e., lower interest rates improve the perception of central bank policy. None of the other variables seem to have a significant effect. In particular, transparency is insignificant throughout (though with a negative sign).[47]

In the Appendix, we show that the results of **Table 1** and **Table 2** do not change after the inclusion of Garriga's CBI index (**Table 8** and **Table 9**). **Table 10** echoes the regressions of **Table 2** without the ZLB dummy. This does not affect the main results either. **Table 11** confirms the basic results, and in addition shows that an inflation target has a favorable effect on managers' opinion, while any deviation from it has the opposite effect. Additionally, there is some weak evidence that inflation also affects manager's opinion unfavorably.[48]

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[47] Note that in all regressions featuring money growth, the results shown are obtained using M3 and not M0; the observations of the latter are incomplete. Importantly, the results obtained using M0 are identical to those obtained using M3 and are available upon request.

[48] Using the Dincer-Eichengreen or Masciandaro-Romelli CBI indices leaves the main results unchanged except that doing so reduces the number of observations. Results are available upon request.

Table 1: Managers' opinion on central bank policy and real variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	"Central bank policy has a positive impact on economic development."													
Inflation	-0.007	-0.006	-0.007	-0.006	-0.013									-0.015
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)									(0.02)
Growth	0.073***	0.073***	0.072***	0.071***	0.068***	0.062***	0.062***	0.061***	0.061***	0.062***	0.062***	0.061***	0.061***	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	
Unemployment	-0.079***	-0.082***	-0.082***	-0.085***	-0.081***	-0.061***	-0.060***	-0.063***	-0.058***	-0.061***	-0.060***	-0.063***	-0.058***	-0.102***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Speech	-0.003***	-0.003***	-0.004***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Transparency	-0.058	-0.081	-0.060	-0.084	-0.056	-0.046	-0.022	-0.048	-0.014	-0.046	-0.022	-0.048	-0.014	-0.053
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Interest Level	-0.025	-0.024	-0.025	-0.023	-0.024	-0.028**	-0.030**	-0.028**	-0.027	-0.028**	-0.030**	-0.028**	-0.027	-0.019
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
VIX	0.046**	0.047**	0.046**	0.047**	0.048**	0.071***	0.070**	0.071***	0.073**	0.071***	0.070**	0.071***	0.073**	-0.008
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Inflation Target		0.350		0.353		0.382		0.384		0.382		0.384		
		(0.26)		(0.26)		(0.28)		(0.29)		(0.28)		(0.29)		
Forward Guidance			0.133	0.141			0.073	0.081			0.073	0.081		
			(0.20)	(0.20)			(0.20)	(0.20)			(0.20)	(0.20)		
Money Growth					0.003				0.000				0.000	
					(0.00)				(0.00)				(0.00)	
Turnover						-0.066	-0.060	-0.064	-0.053	-0.066	-0.060	-0.064	-0.053	
						(0.06)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)	
Output gap														0.039
														(0.02)
N	892	892	892	892	878	921	921	921	907	921	921	921	907	710
Countries	60	60	60	60	60	61	61	61	61	61	61	61	61	50
R2	0.29	0.30	0.30	0.30	0.29	0.26	0.25	0.26	0.24	0.26	0.25	0.26	0.24	0.28

Country fixed-effects panel regressions with panel clustered standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and dummies are not shown in the table). All variables on the right-hand side are lagged by one year.

Table 2: Managers' opinion on central bank policy and financial market variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	"Central bank policy has a positive impact on economic development."												
Inflation	0.001							-0.004	-0.005	0.001	-0.005	-0.004	-0.004
	(0.01)							(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Growth	0.066***	0.065***	0.063***	0.061***	0.060***	0.059***	0.063***	0.077***	0.074***	0.073***	0.068***	0.075***	0.074***
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment	-0.078***	-0.055**	-0.052**	-0.053**	-0.051**	-0.053**	-0.053**	-0.073***	-0.074***	-0.074***	-0.074***	-0.074***	-0.075***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Speech	-0.003**	-0.003**	-0.003***	-0.003***	-0.003***	-0.002***	-0.002**	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Transparency	-0.049	-0.020	-0.023	-0.026	-0.018	-0.025	-0.013	-0.055	-0.059	-0.061	-0.053	-0.058	-0.051
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Interest Level	-0.030	-0.032**	-0.032***	-0.033***	-0.027*	-0.030**	-0.032**	-0.029*	-0.029*	-0.034*	-0.020	-0.028*	-0.029
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Debt-to-GDP	0.000	0.001						-0.001					
	(0.01)	(0.01)						(0.01)					
FX Rate	0.000		0.000						0.000				
	(0.00)		(0.00)						(0.00)				
FX Var	-0.000			-0.000***						-0.000			
	(0.00)			(0.00)						(0.00)			
Var Coef.	-1.799				-1.727						-2.486*		
	(1.60)				(1.27)						(1.33)		
Stock Market	-0.000**						-0.000*						-0.000**
	(0.00)						(0.00)						(0.00)
Crisis	0.048					-0.243						-0.056	
	(0.15)					(0.18)						(0.15)	
ZLB	-0.128	-0.299	-0.186	-0.204	-0.220	-0.300	-0.330	-0.237	-0.120	-0.152	-0.146	-0.240	-0.270
	(0.18)	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)	(0.20)	(0.17)	(0.17)	(0.18)	(0.16)	(0.18)	(0.18)
Turnover		-0.068	-0.069	-0.057	-0.052	-0.063	-0.066						
		(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)						
N	844	912	903	903	903	921	900	883	874	874	874	892	871
Countries	59	61	60	60	60	61	61	60	59	59	59	60	60
R2	0.30	0.25	0.25	0.25	0.25	0.26	0.25	0.30	0.30	0.29	0.30	0.30	0.29

Country fixed-effects panel regressions with panel clustered standard errors in parentheses. Significance levels are indicated with asterisks as follows: * p < 0.10, ** p < 0.05, *** p < 0.01.
The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and dummies are not shown in the table). All variables on the right-hand side are lagged by one year.

6.2 Results since the GFC

An important question is whether the eruption of the GFC changed the main results reported above. To answer this question, we constructed a dummy variable intended to capture the GFC, starting in 2008 and with duration limited to 2012. Hence, the dummy variable is set equal to one from 2008 to 2012 and is zero otherwise. **Table 3** summarizes the respective results. It can be observed that the coefficients of speeches, growth and unemployment continue to be significant and exhibit the same sign as above. More interesting is that the interaction of speeches with the crisis dummy is always negative and in approximately 50% of cases significant. This means that the

negative impact of communication on managers' opinion has even worsened during the period we associate with the GFC.[49]

Note also that the interaction of the GFC dummy with growth exhibits a negative sign and is partly significant. In combination with the positive and highly significant effect of economic growth, we conclude that a growth increase during the GFC was less effective in influencing managers' views on the economic impact of their central bank than before and after the GFC. The interaction of the dummy with unemployment is, except in one regression, insignificant. This suggests that an increase in the unemployment rate did not affect the managers' view during the GFC differently from before and after the GFC.

Another result relates to forward guidance, the interaction of which with the crisis dummy becomes significant and negative. This means that during the GFC forward guidance seemed to have backfired in terms of managers' opinion of their central bank's policies. While this result is interesting, we do not overemphasize it due to the limited number of observations. Specifically, only four countries implemented forward guidance during 2008—2012, namely, Canada (2009–10), Japan (2010–12), Sweden (2009–10), and the U.S. (2008–12). Moreover, the interaction term is merely a dummy variable. It does not represent the intensity of forward guidance or crisis. As a result, it is possible that the interaction term captures a spurious effect of a time dummy pertaining to certain countries.[50]

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[49] Extending the dummy variable until 2013 does not alter the results dramatically. However, the speech variable is no longer significant in all regressions.

[50] The results may be affected by common coefficients across countries. For instance, respondents in a high-inflation country may answer differently than those in low-inflation countries. To control for this potential effect, **Table 14** in the Appendix presents regressions using a dummy for emerging market countries. The results do not change.

Table 3: Managers' opinion on central bank policy and the Global Financial Crisis (GFC)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	"Central bank policy has a positive impact on economic development."													
Crisis 2008–12	-0.065	0.056	-0.059	0.051	-0.103	-0.349	-0.527	-0.350	-0.460	-0.349	-0.527	-0.350	-0.460	-0.157
	(0.40)	(0.38)	(0.40)	(0.38)	(0.41)	(0.45)	(0.48)	(0.45)	(0.43)	(0.45)	(0.48)	(0.45)	(0.43)	(0.49)
Inflation	-0.004	-0.003	-0.004	-0.003	-0.009									-0.015
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)									(0.02)
Inflation × Crisis 2008–12	-0.015	-0.015	-0.016	-0.016	-0.010									-0.007
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)									(0.03)
Growth	0.092***	0.092***	0.091***	0.092***	0.086***	0.069***	0.068***	0.069***	0.066***	0.069***	0.068***	0.069***	0.066***	
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	
Growth × Crisis 2008–12	-0.051**	-0.055**	-0.051**	-0.055**	-0.048**	-0.027	-0.020	-0.027	-0.012	-0.027	-0.020	-0.027	-0.012	
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	
Unemployment	-0.082***	-0.084***	-0.082***	-0.084***	-0.082***	-0.067***	-0.065***	-0.066***	-0.065***	-0.067***	-0.065***	-0.066***	-0.065***	-0.098***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Unemployment × Crisis 2008–12	-0.016	-0.018	-0.015	-0.017	-0.016	-0.018	-0.014	-0.017	-0.016	-0.018	-0.014	-0.017	-0.016	-0.023**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Speech	-0.002**	-0.002**	-0.003***	-0.003**	-0.002***	-0.002**	-0.003***	-0.003**	-0.002**	-0.002**	-0.003***	-0.003**	-0.002**	-0.004***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Speech × Crisis 2008–12	-0.002**	-0.002	-0.002	-0.001	-0.002**	-0.001	-0.002*	-0.001	-0.002***	-0.001	-0.002*	-0.001	-0.002***	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Transparency	-0.077	-0.101**	-0.077	-0.099*	-0.077	-0.073	-0.048	-0.070	-0.044	-0.073	-0.048	-0.070	-0.044	-0.078
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Transparency × Crisis 2008–12	0.037	0.019	0.043	0.026	0.040	0.031	0.067*	0.038	0.057	0.031	0.067*	0.038	0.057	0.055
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Interest Level	-0.027	-0.024	-0.026	-0.024	-0.026	-0.027*	-0.030**	-0.027*	-0.028	-0.027*	-0.030**	-0.027*	-0.028	-0.021
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)
Interest Level × Crisis 2008–12	0.015	0.003	0.006	-0.004	0.013	-0.042	-0.039	-0.048	-0.018	-0.042	-0.039	-0.048	-0.018	-0.009
	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)
Inflation Target		0.382		0.355		0.409		0.380		0.409		0.380		
		(0.26)		(0.27)		(0.28)		(0.29)		(0.28)		(0.29)		
Inflation Target × Crisis 2008–12		0.189		0.174		0.291		0.269		0.291		0.269		
		(0.20)		(0.20)		(0.22)		(0.22)		(0.22)		(0.22)		
Forward Guidance			0.188	0.129			0.187	0.124			0.187	0.124		
			(0.23)	(0.26)			(0.24)	(0.27)			(0.24)	(0.27)		
Forward Guidance × Crisis 2008–12			-0.697**	-0.586*			-0.791**	-0.657*			-0.791**	-0.657*		
			(0.32)	(0.33)			(0.32)	(0.34)			(0.32)	(0.34)		
Money Growth					0.003				0.001				0.001	
					(0.00)				(0.00)				(0.00)	
Money Growth × Crisis 2008–12					0.000				-0.013				-0.013	
					(0.01)				(0.02)				(0.02)	
Turnover						-0.064	-0.070	-0.070	-0.066	-0.064	-0.070	-0.070	-0.066	
						(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	
Turnover × Crisis 2008–12						0.052	0.055	0.036	0.096	0.052	0.055	0.036	0.096	
						(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	
Output Gap														0.019
														(0.03)
Output Gap × Crisis 2008–12														0.043
														(0.05)
N	892	892	892	892	878	921	921	921	907	921	921	921	907	710
Countries	60	60	60	60	60	61	61	61	61	61	61	61	61	50
R2	0.31	0.32	0.32	0.33	0.31	0.28	0.28	0.29	0.26	0.28	0.28	0.29	0.26	0.30

Country fixed-effects panel regressions with panel clustered standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and yearly time dummies are not shown in the table). All variables on the right-hand side are lagged by one year. Crisis 2008–12 is a dummy variable for years from 2008 to 2012. We also include interaction terms with this variable.

7 Robustness analysis

To further confirm that our results do not suffer from endogeneity issues, we run different robust regressions based on fixed effects (FE) regressions of **Table 1**. In addition, we use an alternative GFC measure.

7.1 Endogeneity

Table 4 summarizes the results of the two-stage least-squares (2SLS) within estimator, where independent variables are instrumented by the lagged values of themselves and time dummies. The results are similar to the FE results, except that the level of short-term interest rates become insignificant throughout. The p-values of Sargan-Hansen statistics show that over-identification restrictions are satisfied.

Table 4: Managers' opinion on central bank policy – Robustness – two-stage least-squares (2SLS) within estimator

	"Central bank policy has a positive impact on economic development."									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Inflation	-0.022	-0.013	-0.022	-0.013	-0.036					-0.047
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)					(0.04)
Growth	0.147***	0.146***	0.146***	0.146***	0.146***	0.124***	0.127***	0.126***	0.117***	
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	
Unemployment	-0.072***	-0.073***	-0.072***	-0.074***	-0.073***	-0.048***	-0.044***	-0.046***	-0.045***	-0.092***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Speech	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Transparency	-0.039	-0.059	-0.039	-0.059	-0.040	-0.023	0.001	-0.021	0.000	-0.036
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)
Interest Level	0.017	0.009	0.017	0.010	0.026	-0.010	-0.012	-0.011	-0.006	0.040
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)	(0.02)	(0.04)
Inflation Target		0.241		0.241		0.285		0.284		
		(0.18)		(0.18)		(0.18)		(0.18)		
Forward Guidance			0.012	0.018			-0.104	-0.098		
			(0.15)	(0.15)			(0.15)	(0.15)		
Money Growth					-0.002				-0.002	
					(0.00)				(0.00)	
Turnover						-0.002	-0.002	-0.005	0.001	
						(0.07)	(0.07)	(0.07)	(0.07)	
Output gap										0.212***
										(0.07)
N	842	842	842	842	829	861	861	861	848	667
Countries	58	58	58	58	58	58	58	58	58	50
R2 overall	0.125	0.122	0.125	0.121	0.134	0.120	0.130	0.122	0.125	0.092

Estimates are from two-stage least-squares (2SLS) within estimators. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The table shows results of regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." All variables on the right-hand side are lagged by one year.

Table 5 displays the results from the system GMM estimator (a one-step estimator).

Considering the post-estimation results first, the second-order serial correlation test (AR(2)) and the Hansen test for over-identification restrictions show that two moment conditions of the GMM are satisfied. Additionally, the results do not suffer from the "too many instruments" problem (Roodman (2009)) since the number of instruments is smaller than that of countries. Results of the one-step system GMM show that the lagged endogenous variable is significantly positive. Inflation is positive and insignificant. GDP growth is again positive and highly significant. The number of speeches is likewise negative and at least weakly significant in all cases with one exception. In contrast to FE results, unemployment becomes insignificant (but retains the negative sign). Transparency stays insignificant but becomes positive. Interest rate levels are negative throughout, also consistently with the above results.

Table 5: Managers' opinion on central bank policy – Robustness – system GMM estimator (a one-step estimator)

	"Central bank policy has a positive impact on economic development."									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IMD Survey	0.564***	0.556***	0.561***	0.553***	0.581***	0.578***	0.578***	0.576***	0.586***	0.635***
	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Inflation	0.016	0.016	0.016	0.016	0.007					0.020
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)					(0.02)
Growth	0.059***	0.059***	0.057***	0.057***	0.052***	0.044***	0.043***	0.043***	0.039**	
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	
Unemployment	-0.004	-0.011	-0.007	-0.013	-0.010	0.023	0.022	0.022	0.006	-0.014
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Speech	-0.001**	-0.001	-0.001***	-0.001	-0.001*	-0.001*	-0.002***	-0.002*	-0.001**	-0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Transparency	0.025	0.016	0.024	0.014	0.027	0.032	0.034	0.031	0.045	0.017
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)
Interest Level	-0.038**	-0.039**	-0.039**	-0.039**	-0.021	-0.038**	-0.039**	-0.038**	-0.024	-0.035
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Inflation Target		0.103		0.105		0.041		0.041		
		(0.12)		(0.12)		(0.14)		(0.14)		
Forward Guidance			0.153	0.148			0.093	0.088		
			(0.10)	(0.10)			(0.11)	(0.11)		
Money Growth					0.003				0.006*	
					(0.00)				(0.00)	
Turnover						0.007	0.009	0.008	0.017	
						(0.07)	(0.07)	(0.07)	(0.07)	
Output gap										0.052***
										(0.02)
N	879	879	879	879	865	908	908	908	894	700
Countries	59	59	59	59	59	60	60	60	60	50
No. of instruments	55	56	56	57	62	50	50	51	56	53
AR1 (p-value)	8.29e-08	8.76e-08	8.32e-08	8.76e-08	9.74e-08	4.01e-08	3.51e-08	4.02e-08	2.10e-08	0.00000115
AR2 (p-value)	0.547	0.577	0.561	0.591	0.505	0.607	0.594	0.609	0.461	0.350
Hansen-J (p-value)	0.199	0.204	0.196	0.202	0.460	0.488	0.475	0.473	0.508	0.347

Estimates are from system GMM estimators (one-step estimators). Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
The table shows results of regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." IMD Survey shows the coefficient for the lagged survey response. All variables on the right-hand side are lagged by one year.

Table 6 reports the results from the system GMM estimator (a two-step estimator). They are similar to those of one-step GMM estimators in **Table 5**.[51]

Table 6: Managers' opinion on central bank policy – Robustness – system GMM estimator (a two-step estimator)

	"Central bank policy has a positive impact on economic development."									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IMD Survey	0.563***	0.557***	0.561***	0.554***	0.581***	0.588***	0.589***	0.587***	0.588***	0.646***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.09)	(0.09)	(0.09)	(0.06)	(0.08)
Inflation	0.016	0.016	0.016	0.016	0.007					0.022
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)					(0.02)
Growth	0.058***	0.058***	0.058***	0.058***	0.052***	0.049**	0.046**	0.046**	0.045***	
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	
Unemployment	-0.016	-0.023	-0.018	-0.026	-0.010	0.008	0.006	0.007	0.007	-0.018
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Speech	-0.001	-0.000	-0.001*	-0.000	-0.001*	-0.001*	-0.002**	-0.001*	-0.001*	-0.002**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Transparency	0.029	0.020	0.028	0.018	0.027	0.038	0.037	0.037	0.040*	0.011
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.01)
Interest Level	-0.040**	-0.040**	-0.041*	-0.041**	-0.021	-0.036*	-0.037*	-0.036*	-0.023	-0.040*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Inflation Target		0.093		0.098		0.012		0.012		
		(0.13)		(0.13)		(0.14)		(0.14)		
Forward Guidance			0.040	0.037			0.105	0.105		
			(0.13)	(0.13)			(0.10)	(0.10)		
Money Growth					0.003				0.006	
					(0.00)				(0.00)	
Turnover						0.050	0.054	0.050	0.050	
						(0.06)	(0.07)	(0.06)	(0.06)	
Output gap										0.048**
										(0.02)
N	879	879	879	879	865	908	908	908	894	700
Countries	59	59	59	59	59	60	60	60	60	50
No. of instruments	55	56	56	57	62	50	50	51	56	53
AR1 (p-value)	0.000000672	0.000000691	0.000000625	0.000000638	9.74e-08	0.000000362	0.000000312	0.000000355	0.000000391	0.00000514
AR2 (p-value)	0.558	0.589	0.564	0.597	0.505	0.657	0.647	0.652	0.521	0.363
Hansen-J (p-value)	0.199	0.204	0.196	0.202	0.460	0.488	0.475	0.473	0.508	0.347

Estimates are from system GMM estimators (two-step estimators). Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
The table shows results of regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." IMD Survey shows the coefficient for the lagged survey response. All variables on the right-hand side are lagged by one year.

Overall, results of 2SLS and system GMM estimators displayed in **Table 4** to **Table 6** indicate that communication and GDP growth keep influencing managers' opinion of central banks' impact on economic outcomes. Unemployment rates are significant in FE and 2SLS analysis, but insignificant in the system GMM. From these robustness analyses, we conclude that a few variables have a causal effect, namely, lagged opinions (lagged IMD Survey values), central bank communication and GDP growth. Unemployment is less robust, as becomes evident in the one-step and two-step GMM

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[51] **Table 13** summarizes the outcome from the system GMM one-step estimator excluding time fixed effects. Results remain unaffected.

estimators. In the case of the other explanatory variables, it seems more uncertain whether they have any causal effect.

Altogether, the results show that communication is a non-trivial negative factor in business managers' perception of central bank activities in the economy. According to the FE results, one additional speech worsens managers' opinion by 0.003. From GMM, we infer a coefficient of -0.001. How do we interpret this outcome? It suggests that a single speech has, as we would expect, a negligible influence on manager's reaction to the IMD statement. What is crucial is the overall effect of communication as measured by the total count of speeches.

It is also noteworthy that while the output gap was insignificant in the FE estimations, it is highly significant and positive throughout in robustness analyses summarized in **Table 4** to **Table 6**, in which output growth was replaced by the output gap, indicating that a positive output gap contributes to a positive view on central banks in this context. This explanatory power of the output gap is explained by the fact that the two variables capture different aspects of the business cycle. While GDP growth rates are measured as year-on-year changes, the output gap is measured by the difference (or ratio) between the actual GDP and its potential level. The output gap reflects the business cycle more accurately but is less popular than the GDP growth rate. In contrast, unemployment rates are lagging indicators of the business cycle. Improvements in the labor market may occur after the recovery of the GDP growth rate or the output gap. More importantly, unemployment rates are affected by structural factors of the labor market.

Forward guidance turns out to be insignificant in **Table 1** and **Table 4** to **Table 6**. In contrast, in **Table 3** the interaction term between forward guidance and crisis (2008-2012) is significant and negative. However, as already pointed out above, considering the small number of observations (only a few countries implemented forward guidance during 2008-2012), it is difficult to draw reliable conclusions from the interaction term.

7.2 Alternative GFC measure

As can be observed from **Table 7** that contains the results after the GFC (whereby the crisis dummy, unlike in **Table 3**, is set equal to 1 from 2008 onwards, and is zero otherwise), speeches continue to exert a negative effect. However, their interaction with the crisis dummy is no longer significant. Together with the evidence reported in **Table 3**, this suggests that the additional negative effect of speeches noted in **Table 3** was contained within the period from 2008 to 2012.

The results pertaining to forward guidance are again interesting. Unlike in **Table 3**, its interaction is highly significant and positive. From this, we may infer that forward guidance during the crisis period had a positive influence, whereas overall it had a highly significant negative effect, as shown by the negative sign of the forward guidance dummy. However, again, we do not overemphasize this result due to the limited number of observations underlying it.

Table 7: Managers' opinion on central bank policy – Robustness – Global Financial Crisis (GFC) extended

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	"Central bank policy has a positive impact on economic development."													
Crisis 2008	-0.512 (0.36)	-0.397 (0.36)	-0.505 (0.37)	-0.391 (0.36)	-0.561 (0.37)	-0.817* (0.44)	-1.005** (0.47)	-0.823* (0.44)	-0.939** (0.40)	-0.817* (0.44)	-1.005** (0.47)	-0.823* (0.44)	-0.939** (0.40)	-0.218 (0.51)
Inflation	-0.006 (0.01)	-0.005 (0.01)	-0.006 (0.01)	-0.005 (0.01)	-0.012 (0.02)									-0.015 (0.02)
Inflation × Crisis 2008	-0.001 (0.01)	-0.001 (0.01)	-0.001 (0.01)	-0.001 (0.01)	0.005 (0.02)									-0.014 (0.03)
Growth	0.102*** (0.01)	0.101*** (0.02)	0.100*** (0.01)	0.100*** (0.02)	0.096*** (0.02)	0.063** (0.02)	0.061** (0.02)	0.062** (0.02)	0.059** (0.02)	0.063** (0.02)	0.061** (0.02)	0.062** (0.02)	0.059** (0.02)	
Growth × Crisis 2008	-0.051** (0.02)	-0.053** (0.02)	-0.051** (0.02)	-0.053** (0.02)	-0.049** (0.02)	-0.012 (0.03)	-0.007 (0.03)	-0.011 (0.03)	0.000 (0.03)	-0.012 (0.03)	-0.007 (0.03)	-0.011 (0.03)	0.000 (0.03)	
Unemployment	-0.080*** (0.02)	-0.080*** (0.02)	-0.082*** (0.02)	-0.082*** (0.02)	-0.080*** (0.02)	-0.064*** (0.02)	-0.065*** (0.02)	-0.065*** (0.02)	-0.064*** (0.02)	-0.064*** (0.02)	-0.065*** (0.02)	-0.065*** (0.02)	-0.064*** (0.02)	-0.103*** (0.02)
Unemployment × Crisis 2008	-0.012 (0.01)	-0.014 (0.01)	-0.013 (0.01)	-0.014 (0.01)	-0.012 (0.01)	-0.018 (0.01)	-0.016 (0.01)	-0.019 (0.01)	-0.016 (0.01)	-0.018 (0.01)	-0.016 (0.01)	-0.019 (0.01)	-0.016 (0.01)	-0.018 (0.01)
Speech	-0.003** (0.00)	-0.003* (0.00)	-0.004** (0.00)	-0.003* (0.00)	-0.004** (0.00)	-0.003** (0.00)	-0.004** (0.00)	-0.003** (0.00)	-0.004** (0.00)	-0.003** (0.00)	-0.004** (0.00)	-0.003** (0.00)	-0.004** (0.00)	-0.007*** (0.00)
Speech × Crisis 2008	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.001 (0.00)
Transparency	-0.074 (0.05)	-0.089* (0.05)	-0.077 (0.05)	-0.092* (0.05)	-0.077 (0.05)	-0.072 (0.05)	-0.056 (0.05)	-0.072 (0.05)	-0.050 (0.06)	-0.072 (0.05)	-0.056 (0.05)	-0.072 (0.05)	-0.050 (0.06)	-0.069 (0.06)
Transparency × Crisis 2008	0.045 (0.03)	0.021 (0.04)	0.042 (0.03)	0.019 (0.04)	0.047 (0.03)	0.048 (0.04)	0.080* (0.04)	0.047 (0.05)	0.078** (0.04)	0.048 (0.04)	0.080* (0.04)	0.047 (0.05)	0.078** (0.04)	0.056 (0.04)
Interest Level	-0.027 (0.02)	-0.024 (0.02)	-0.027 (0.02)	-0.024 (0.02)	-0.025 (0.02)	-0.022 (0.01)	-0.027* (0.01)	-0.023 (0.01)	-0.020 (0.02)	-0.022 (0.01)	-0.027* (0.01)	-0.023 (0.01)	-0.020 (0.02)	-0.021 (0.03)
Interest Level × Crisis 2008	-0.016 (0.02)	-0.029 (0.03)	-0.014 (0.02)	-0.027 (0.02)	-0.018 (0.03)	-0.035* (0.02)	-0.024 (0.02)	-0.034* (0.02)	-0.021 (0.02)	-0.035* (0.02)	-0.024 (0.02)	-0.034* (0.02)	-0.021 (0.02)	-0.011 (0.04)
Inflation Target		0.315 (0.27)		0.311 (0.27)		0.326 (0.28)		0.317 (0.29)		0.326 (0.28)		0.317 (0.29)		
Inflation Target × Crisis 2008		0.218 (0.22)		0.216 (0.22)		0.289 (0.20)		0.295 (0.21)		0.289 (0.20)		0.295 (0.21)		
Forward Guidance			-0.762*** (0.16)	-0.746*** (0.17)			-0.889*** (0.17)	-0.878*** (0.18)			-0.889*** (0.17)	-0.878*** (0.18)		
Forward Guidance × Crisis 2008			0.909*** (0.22)	0.887*** (0.22)			0.962*** (0.23)	0.948*** (0.23)			0.962*** (0.23)	0.948*** (0.23)		
Money Growth					0.003 (0.00)				0.001 (0.00)				0.001 (0.00)	
Money Growth × Crisis 2008					0.002 (0.01)				-0.008 (0.01)				-0.008 (0.01)	
Turnover						-0.088 (0.10)	-0.097 (0.10)	-0.093 (0.10)	-0.088 (0.10)	-0.088 (0.10)	-0.097 (0.10)	-0.093 (0.10)	-0.088 (0.10)	
Turnover × Crisis 2008						0.079 (0.14)	0.105 (0.14)	0.088 (0.14)	0.096 (0.14)	0.079 (0.14)	0.105 (0.14)	0.088 (0.14)	0.096 (0.14)	
Output Gap														0.009 (0.04)
Output Gap × Crisis 2008														0.059 (0.04)
N	892	892	892	892	878	921	921	921	907	921	921	921	907	710
Countries	60	60	60	60	60	61	61	61	61	61	61	61	61	50
R2	0.31	0.32	0.32	0.33	0.31	0.29	0.28	0.29	0.27	0.29	0.28	0.29	0.27	0.30

Country fixed-effects panel regressions with panel clustered standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The table shows results of fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and yearly time dummies are not shown in the table). All variables on the right-hand side are lagged by one year. Crisis 2008 is a dummy variable equal to one from 2008 onwards. We also include interaction terms with this variable.

8 Discussion

What shapes the business community's opinion of central bank policies? We have found several interesting answers. First, more central bank communication has a negative effect, which was even more so during the GFC. This is striking, given the importance attached to transparent communication in the academic literature, the large empirical evidence supporting its beneficial effects, and the increasing attention paid to it in practice. This finding is the main contribution to the literature we make. Second, central bank independence and transparency exhibit no effect. This is also remarkable, given their importance – much stressed by academics and central bankers – in raising trust, credibility and accountability. Third, our evidence for real variables is consistent with previous findings in the trust literature. Hence, if trust in central banks evolves in accordance with managers' perceptions, then the evidence found in this paper points to potential problems from trust-building actions that are based on central bank communication. Fourth, our results for real variables are obvious at first sight. After all, they are somewhat similar to the idea "It's the economy, stupid." Upon closer inspection, however, they are puzzling. Business executives seem to associate good economic performance with central banks' activities. However, this is at odds with a broad consensus in economic theory, which suggests that monetary policy can influence the business cycle, but not the potential output. There is broad evidence from many economies over many years that in the long run, the central bank can do little about real variables.[52] Yet, Mankiw & Reis (2018) argue that it is not uncommon today to hear central bankers pontificate in speeches about such issues.[53] Fifth, inflation does not seem to be an influencing factor, which is, again, surprising. While the centerpiece of Milton Friedman's 1967 Presidential Address was the proposition that (at most) monetary policy induces only transitory deviations of the real interest rate and the unemployment rate from their natural rates, the message was broader. In the longer run, monetary policy controls only the price level. However, as our results

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[52] See Hall & Sargent (2018) and Mankiw & Reis (2018).

[53] Having said that, we note that several authors found evidence that monetary policy has a large and prolonged effect on real activity. See, e.g., Christiano et al. (1999) and Romer & Romer (2004).

indicate, achieving or not the only variable that central banks are expected to control in the medium to long term does not play a role in determining their perceived role in the economy. Sixth, in times of economic uncertainty, as measured by the VIX, the economic influence of central banks is positively assessed. This suggests that central banks are considered efficient in weathering times of rising global uncertainty.

9   Conclusions

We identified the driving forces of business executives' opinion of the economic impact of their central bank. The panel we used included 61 countries and covered the period from 1998 to 2016. Particular attention was given to central bank communication. The resulting evidence is clear-cut. Increased central bank communication has a harmful effect in this regard. During the Global Financial Crisis, this effect became even stronger, although we would expect that more communication would be particularly important to informing the public, and executives in particular, in times of greater uncertainty. On the other hand, central banks are regarded more positively when the economy grows. While the latter seems intuitive, the question of what causes central bank communication to harm business managers' opinion is intricate. One possibility is that, as Coenen et al. (2017) point out, there have been several changes in the way central banks communicate that occurred after the crisis. Communication became more dispersed, resulting from higher complexity in the policy-making process and greater disagreement regarding the implementation of monetary policy. The researchers also argue that central banks' statements became more forward-looking. In many cases, statements became longer and the difficulty of the language used increased in comparison to those before the crisis. Another possibility, as surmised by Lustenberger & Rossi (2020), is that a cacophony of voices could make it difficult to grasp the main message. The difficulty could also be due to a multitude of communication tools not tailored to the specific audience.

According to Haldane (2017), the revolution in central bank communications over

the recent years, with much wider and deeper engagement with society, has been essential to building central bank trust and credibility during good times and protecting central bank legitimacy and independence during bad times. However, in recent years, central banks have faced mounting criticism, and some mistrust, of their actions, responsibilities and influence. Since trust in institutions seems to have been eroded despite a great deal more being published, including by central banks, building trust and legitimacy has become one of the most pressing issues facing central banks today. Haldane (2017) argues that "complex language is these days more likely to breed mistrust than mystique." Expert opinions have become a source of skepticism rather than reassurance. As can be observed by examining the data on U.S. adult literacy surveys, the penetration rate of various central bank publications is very low compared to that of other communications. Herein lies central banks' challenge. Increased communications are met by a reduction in public trust and understanding and, as we show, in business managers' judgment of central banks' ability to handle economic problems. Haldane (2017) concludes that conventional means of communicating are unlikely to be able to reach the parts of society for which mistrust and misunderstanding are most acute. To reach that wider audience, central banks need new tools and techniques. As emphasized by Haldane & McMahon (2018), with research on the impact of central bank communications on the general public still in its infancy, further research would be valuable for establishing the benefits and feasibility of such strategies. On a practical level, central banks aiming to reach a broader audience will need to continue to innovate and experiment with different methods and media for engaging the general public.

While Blinder (2018) is skeptical about central banks' reaching a wider audience because only a tiny fraction of the citizenry will tune in to these communications, our paper shows that the challenge is not only in addressing the cohorts that are currently out of reach of central banks, such as the young and the less well-off. The problem seems to be deeper than that. Business managers are listening. However, what they hear is conducive not to raising but rather to downgrading the effect on the economy

they attribute to their central bank. The problem is perhaps less in how this important part of the public is approached by communication, but is rather in the quantity and content of communication. Are some addressed topics mainly responsible for influencing the scores of surveys such as ours? This is an important direction for future research, in particular, if, as Blinder et al. (2017) hypothesize, central banks in the future will communicate more.

Appendix A   Data

IMD Survey   We use the Executive Opinion Survey in the World Competitiveness Yearbook published by the Institute for Management Development. The IMD poses the statement "Central bank policy has a positive impact on economic development." The possible responses are 1 (Disagree), 2, 3, 4, 5 and 6 (Agree). We use the average of responses, rescaled to the range of [0 – 10].[54] Data is available from 1995 to 2019.

Inflation   Inflation is the annual percentage change of consumer prices provided by the World Bank.

Inflation Expectation   Inflation expectation is the difference between a forecast for a 12-month horizon and the corresponding "nowcast" (a forecast with a 1-month horizon), both obtained from surveys by Consensus Economics.

Growth   We use the annual percentage growth rate of GDP at market prices based on constant local currency provided by the World Bank. Aggregates are based on constant 2010 U.S. dollars. The GDP is the sum of gross value added by all resident producers in the economy and any product taxes, less any subsidies not included in the value of the products. It is calculated without deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Output Gap   The output gap series is from Baumann, Rossi & Volkmann (2020).

Unemployment   The unemployment rate is the total (% of total labor force) (the modeled ILO estimate), provided by the World Bank.

Crisis   This variable is based on the dataset provided by Laeven & Valencia (2018). We use all types of the cited study's reported country-specific crisis years, i.e., those of banking, currency and sovereign crises.

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[54] The transformation is as follows: ("average rating" $\times 2$) $- 2$.

CBI   We downloaded the CBI indices compiled by Dincer & Eichengreen (2014), Garriga (2016), and Masciandaro & Romelli (2018).

Turnover   The turnover variable is based on Dreher et al. (2010).[55] In addition, we updated the data according to Lustenberger & Rossi (2017*a*)). Higher values mean more frequent changes of central bank governors or lower actual independence.

Transparency   The updated transparency index is from Dincer et al. (2019).[56] For all euro area countries, we assign the transparency values of the ECB. For the countries that entered the currency area after 1998, we assign the ECB value from the respective country's entrance year onwards. For CYP, EST, LVA, LTU, SVK, SVN and VEN, the 2015 update of the transparency index no longer contains values (for euro area countries before they entered the currency area). Therefore, we used the values from the 2014 update. TWN is assigned a value of 11 for 2013 and 2014.[57]

Inflation Target   We constructed a dummy for inflation-targeting countries, following Lustenberger & Rossi (2017*a*), and updated it accordingly.

Speech   Variable Speech represents the number of speeches given by a central bank in a year. We compiled this variable's series based on the BIS database of central bankers' speeches.[58] Speeches from the euro area include all speeches of ECB Board members and the top management of the Eurosystem's member central banks. We counted speeches associated with AUT, BEL, FIN, FRA, DEU, IRL, ITA, LUX, NLD, PRT and ESP as speeches from the euro area, starting in 1998. In addition, we added to the observations of the euro area the values for GRC from 2001, SVN from 2007, CYP and MLT from 2008, SVK from 2009, EST from 2011, LVA from 2014 and LTU from 2015 on.

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[55] See `https://kof.ethz.ch/en/data/data-on-central-bank-governors.html`.
[56] See `https://eml.berkeley.edu/%7Eeichengr/data.shtml`.
[57] See Lustenberger & Rossi (2017*a*).
[58] `https://www.bis.org/list/cbspeeches/`.

ZLB   It is a dummy variable equal to 1 if the Interest Level is below +0.5%. Interest Level is described below.

Money Growth   We use the base money supply as a proxy of QE. The data is from Refinitiv Datastream and is obtained for "Refinitiv Comparable Economics - Money Supply M0 (Standardized)", available for approximately 50 countries. To avoid losing observations, we use the broad money growth (annual, %) from the World Bank that covers all countries considered. For euro area countries, where the World Bank data is unavailable, we rely on OECD data (Broad money, M3).

Forward Guidance   We constructed a forward guidance dummy according to Lustenberger & Rossi (2017*a*) and updated it to 2015.

Debt-to-GDP   This variable is the ratio of Central Government Debt to GDP from the IMF Global Debt database available up to December 2018.

Interest Level   We use the BIS policy rates.[59] If the BIS does not provide a policy rate for a specific country, we use the Refinitiv Datastream policy rate. If the latter is unavailable, we revert to the deposit rate provided by the World Bank.

FX Rate   This variable is the yearly average exchange rate to USD, provided by the IMF International Financial Statistics.

FX Var   This variable is the yearly variance of monthly exchange rates, provided by the IMF Financial Statistics.

Var Coef.   This variable is the ratio of FX Var and FX Rate, described above.

Stock Market   We use annual averages of MSCI country stock market indices taken from Refinitiv Datastream.

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[59] See https://www.bis.org/statistics/cbpol.htm.

Market Uncertainty   The global market uncertainty is measured by the VIX.

Crisis 2008–2012   This variable is a dummy for the GFC and equals one for years from 2008 to 2012.

Crisis 2008   This variable is a dummy for the GFC and equals one from 2008 onwards.

Dev. from Target   This variable is the deviation of inflation from the central bank's official inflation target. We compiled inflation targets for the countries involved and set the dummy variable equal to one (see above). We calculated absolute deviations between CPI inflation forecasts provided by Consensus Economics and the official target.

Dev. from Target 2%   We calculated absolute deviations between CPI inflation forecasts provided by Consensus Economics and a targeted level of 2% annual inflation. We applied a 2% inflation-targeting regime for all countries.

Inflation FE   We computed absolute inflation forecast errors based on average inflation expectations of professional forecasters on a 12-month horizon and subtracted the corresponding nowcast (the forecast for a 1-month horizon), both of which were obtained from surveys by Consensus Economics.

Appendix B   Additional Results

Table 8 adds the Garriga CBI index to the regressions of **Table 1**. Nothing changes compared to **Table 1**, except that VIX becomes insignificant once the Garriga CBI index, which in turn is insignificant, is added as a regressor. This result suggests that the positive impact of central banks in times of global uncertainty shown in **Table 1** vanishes once we control for the (de jure) independence of central banks. From this perspective, VIX does not seem to be robust.[60]

Table 9 displays the results of the regressions shown in **Table 2** including the Garriga CBI index. Again, no appreciable change can be noted, and the CBI index and turnover are still insignificant.

Table 10 includes the same variables as **Table 9** except for the CBI index and the ZLB dummy. These changes do not alter the main results either.

In **Table 11**, we summarize the results for the deviations of professional forecasts from an inflation target. The main results remain unaltered, while the introduction of an inflation target contributes to improving the managers' judgment. However, as the interaction term of inflation forecast deviations from the target and the inflation target dummy suggests, target misses, perhaps unsurprisingly, affect managers' perception negatively.

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[60] Note that CBI (and turnover) are insignificant also if VIX is not controlled for.

Table 8: Managers' opinion on central bank policy – Robustness – central bank and real variables, with Garriga CBI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
"Central bank policy has a positive impact on economic development."														
Inflation	-0.007	-0.006	-0.007	-0.006	-0.013									-0.015
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)									(0.02)
Growth	0.073***	0.073***	0.072***	0.071***	0.068***	0.057***	0.059***	0.058***	0.056***	0.062***	0.062***	0.061***	0.061***	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	
Unemployment	-0.079***	-0.082***	-0.082***	-0.085***	-0.081***	-0.065***	-0.057**	-0.062**	-0.062**	-0.061***	-0.060***	-0.063***	-0.058***	-0.102***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Speech	-0.003***	-0.003***	-0.004***	-0.003***	-0.003***	-0.004***	-0.004***	-0.004***	-0.004***	-0.003***	-0.003***	-0.003***	-0.003***	-0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Transparency	-0.058	-0.081	-0.060	-0.084	-0.056	-0.037	-0.011	-0.031	-0.014	-0.046	-0.022	-0.048	-0.014	-0.053
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Interest Level	-0.025	-0.024	-0.025	-0.023	-0.024	-0.033**	-0.036**	-0.033**	-0.035	-0.028**	-0.030**	-0.028**	-0.027	-0.019
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
VIX	0.046**	0.047**	0.046**	0.047**	0.048**	0.052	0.048	0.050	0.054	0.071***	0.070**	0.071***	0.073**	-0.008
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.05)	(0.05)	(0.05)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Inflation Target		0.350		0.353		0.385		0.377		0.382		0.384		
		(0.26)		(0.26)		(0.33)		(0.32)		(0.28)		(0.29)		
Forward Guidance			0.133	0.141			-0.488*	-0.476			0.073	0.081		
			(0.20)	(0.20)			(0.29)	(0.30)			(0.20)	(0.20)		
Money Growth				0.003					-0.001				0.000	
				(0.00)					(0.00)				(0.00)	
CBI (Garriga)						0.055	0.079	-0.006	0.219					
						(0.90)	(0.83)	(0.90)	(0.86)					
Turnover						-0.059	-0.067	-0.069	-0.043	-0.066	-0.060	-0.064	-0.053	
						(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)	
Output gap														0.039
														(0.02)
N	892	892	892	892	878	734	734	734	724	921	921	921	907	710
Countries	60	60	60	60	60	55	55	55	55	61	61	61	61	50
R2	0.29	0.30	0.30	0.30	0.29	0.27	0.27	0.28	0.26	0.26	0.25	0.26	0.24	0.28

Country fixed-effects panel regressions with panel clustered standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and dummies are not shown in the table). All variables on the right-hand side are lagged by one year.

Table 9: Managers' opinion on central bank policy – Robustness – financial market variables, with Garriga CBI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	\"Central bank policy has a positive impact on economic development.\"												
Inflation	0.001 (0.01)							-0.004 (0.01)	-0.005 (0.01)	0.001 (0.01)	-0.005 (0.01)	-0.004 (0.01)	-0.004 (0.01)
Growth	0.066*** (0.01)	0.056*** (0.02)	0.055*** (0.02)	0.053*** (0.01)	0.053*** (0.02)	0.057*** (0.02)	0.055*** (0.02)	0.077*** (0.01)	0.074*** (0.01)	0.073*** (0.01)	0.068*** (0.01)	0.075*** (0.01)	0.074*** (0.01)
Unemployment	-0.078*** (0.02)	-0.050** (0.02)	-0.056** (0.03)	-0.056** (0.03)	-0.053** (0.03)	-0.056** (0.03)	-0.055** (0.03)	-0.073*** (0.02)	-0.074*** (0.02)	-0.074*** (0.02)	-0.074*** (0.02)	-0.074*** (0.02)	-0.075*** (0.02)
Speech	-0.003** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)
Transparency	-0.049 (0.06)	-0.022 (0.06)	-0.026 (0.06)	-0.026 (0.06)	-0.023 (0.06)	-0.026 (0.06)	-0.023 (0.06)	-0.055 (0.05)	-0.059 (0.05)	-0.061 (0.05)	-0.053 (0.05)	-0.058 (0.05)	-0.051 (0.05)
Interest Level	-0.030 (0.02)	-0.038*** (0.01)	-0.038*** (0.01)	-0.040*** (0.01)	-0.035** (0.02)	-0.039*** (0.01)	-0.037*** (0.01)	-0.029* (0.02)	-0.029* (0.02)	-0.034* (0.02)	-0.020 (0.02)	-0.028* (0.02)	-0.029 (0.02)
Debt-to-GDP	0.000 (0.01)	-0.002 (0.01)						-0.001 (0.01)					
FX Rate	0.000 (0.00)		0.000 (0.00)						0.000 (0.00)				
FX Var	-0.000 (0.00)			-0.000* (0.00)						-0.000 (0.00)			
Var Coef.	-1.799 (1.60)				-1.127 (1.24)						-2.486* (1.33)		
Stock Market	-0.000** (0.00)						0.000* (0.00)						-0.000** (0.00)
Crisis	0.048 (0.15)					0.075 (0.16)						-0.056 (0.15)	
ZLB	-0.128 (0.18)	-0.601** (0.29)	-0.462 (0.34)	-0.457 (0.33)	-0.488 (0.33)	-0.625** (0.31)	-0.623** (0.31)	-0.237 (0.17)	-0.120 (0.17)	-0.152 (0.18)	-0.146 (0.16)	-0.240 (0.18)	-0.270 (0.18)
CBI (Garriga)		0.253 (0.92)	0.301 (0.85)	-0.028 (0.96)	0.188 (0.85)	0.257 (0.86)	0.377 (0.90)						
Turnover		-0.041 (0.08)	-0.055 (0.07)	-0.039 (0.08)	-0.036 (0.08)	-0.050 (0.07)	-0.043 (0.07)						
N	844	728	719	719	719	734	713	883	874	874	874	892	871
Countries	59	55	54	54	54	55	55	60	59	59	59	60	60
R2	0.30	0.28	0.28	0.27	0.27	0.28	0.28	0.30	0.30	0.29	0.30	0.30	0.29

Country fixed-effects panel regressions with panel clustered standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and dummies are not shown in the table). All variables on the right-hand side are lagged by one year.

Table 10: Managers' opinion on central bank policy – Robustness – financial market variables, excluding CBI and the ZLB dummy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	"Central bank policy has a positive impact on economic development."												
Inflation	0.001 (0.01)							-0.006 (0.01)	-0.006 (0.01)	-0.000 (0.01)	-0.007 (0.01)	-0.006 (0.01)	-0.007 (0.01)
Growth	0.065*** (0.01)	0.063*** (0.02)	0.062*** (0.01)	0.059*** (0.01)	0.058*** (0.01)	0.057*** (0.02)	0.060*** (0.02)	0.075*** (0.01)	0.072*** (0.01)	0.071*** (0.01)	0.067*** (0.01)	0.072*** (0.01)	0.071*** (0.01)
Unemployment	-0.081*** (0.02)	-0.061** (0.02)	-0.055*** (0.02)	-0.057*** (0.02)	-0.055** (0.02)	-0.059*** (0.02)	-0.060*** (0.02)	-0.077*** (0.02)	-0.076*** (0.02)	-0.077*** (0.02)	-0.077*** (0.02)	-0.080*** (0.02)	-0.081*** (0.02)
Speech	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)
Transparency	-0.049 (0.06)	-0.018 (0.07)	-0.022 (0.06)	-0.026 (0.06)	-0.017 (0.07)	-0.023 (0.06)	-0.013 (0.07)	-0.054 (0.05)	-0.059 (0.05)	-0.061 (0.05)	-0.052 (0.06)	-0.058 (0.05)	-0.052 (0.05)
Interest Level	-0.029 (0.03)	-0.030** (0.01)	-0.031** (0.01)	-0.032** (0.01)	-0.025 (0.02)	-0.028** (0.01)	-0.029** (0.01)	-0.026 (0.02)	-0.027 (0.02)	-0.032 (0.02)	-0.018 (0.02)	-0.025 (0.02)	-0.025 (0.02)
Debt-to-GDP	0.000 (0.01)	0.000 (0.01)						-0.001 (0.01)					
FX Rate	0.000 (0.00)		0.000** (0.00)						0.000* (0.00)				
FX Var	-0.000 (0.00)			-0.000*** (0.00)						-0.000 (0.00)			
Var Coef.	-1.850 (1.65)				-1.808 (1.38)						-2.568* (1.40)		
Stock Market	-0.000** (0.00)					-0.000 (0.00)							-0.000** (0.00)
Crisis	0.058 (0.15)					-0.238 (0.20)						-0.042 (0.15)	
Turnover		-0.059 (0.07)	-0.064 (0.07)	-0.050 (0.07)	-0.045 (0.07)	-0.055 (0.07)	-0.057 (0.07)						
N	844	912	903	903	903	921	900	883	874	874	874	892	871
Countries	59	61	60	60	60	61	61	60	59	59	59	60	60
R2	0.30	0.25	0.25	0.25	0.25	0.25	0.24	0.29	0.30	0.29	0.30	0.29	0.29

Country fixed-effects panel regressions with panel clustered standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and dummies are not shown in the table). All variables on the right-hand side are lagged by one year.

Table 11: Managers' opinion on central bank policy – Robustness – deviations of professional forecasts from inflation targets and forecast errors (FE)

	\"Central bank policy has a positive impact on economic development.\"							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation	0.011 (0.04)	-0.018* (0.01)	-0.019** (0.01)					
Growth	0.059 (0.04)	0.073*** (0.01)	0.070*** (0.01)	0.070*** (0.02)	0.068*** (0.02)	0.070*** (0.02)	0.068*** (0.02)	0.060*** (0.01)
Unemployment	-0.072 (0.05)	-0.077*** (0.01)	-0.080*** (0.01)	-0.056*** (0.02)	-0.058*** (0.02)	-0.056*** (0.02)	-0.058*** (0.02)	-0.053** (0.02)
Speech	0.008 (0.01)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)
Transparency	-0.052 (0.09)	-0.017 (0.04)	-0.054 (0.04)	0.013 (0.05)	-0.026 (0.05)	0.013 (0.05)	-0.026 (0.05)	0.010 (0.06)
Interest Level	-0.096** (0.04)	-0.023 (0.02)	-0.022 (0.02)	-0.033* (0.02)	-0.032* (0.02)	-0.033* (0.02)	-0.032* (0.02)	-0.029 (0.02)
VIX	0.103 (0.06)	0.067*** (0.02)	0.071*** (0.02)	0.075*** (0.02)	0.080*** (0.02)	0.075*** (0.02)	0.080*** (0.02)	0.094*** (0.03)
Dev. from Target	-0.055 (0.08)							
Dev. from Target 2%		0.020 (0.01)	0.025** (0.01)	0.015 (0.01)	0.018 (0.01)	0.015 (0.01)	0.018 (0.01)	
Dev. from Target 2% $\times$ Inflation Target			-0.096** (0.04)		-0.099** (0.04)		-0.099** (0.04)	
Inflation Target			0.759** (0.31)		0.784** (0.35)		0.784** (0.35)	0.536 (0.32)
Turnover				-0.032 (0.08)	-0.038 (0.07)	-0.032 (0.08)	-0.038 (0.07)	-0.013 (0.08)
Inflation FE								-0.015 (0.01)
N	294	796	796	817	817	817	817	753
Countries	24	54	54	55	55	55	55	55
R2	0.27	0.32	0.34	0.28	0.30	0.28	0.30	0.29

Country fixed-effects panel regressions with panel clustered standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and dummies are not shown in the table). All variables on the right-hand side are lagged by one year.

Table 12 displays the results of cross-sectional regressions. Speeches are no longer significant. Only the rate of inflation (negative), GDP growth and the output gap (positive) and the level of interest rates (negative) are (partly) significant. To some extent, this is also true for the turnover rate (negative). The fact that the results are partly different from those in the FE panel is not surprising. Cross-sectional variations may be totally different from temporal variations within each country. Cross-sectional regressions capture country-by-country differences. The number of speeches may have little power in explaining such differences. However, within each country the relative frequency and strength of communication compared with those in a normal year may be very important.

Table 12: Managers' opinion on central bank policy – Robustness – cross-sectional regressions

	"Central bank policy has a positive impact on economic development."									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Inflation	-0.096***	-0.088**	-0.096***	-0.088**	-0.118***					-0.064
	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)					(0.05)
Growth	0.185***	0.180***	0.185***	0.180***	0.150***	0.188***	0.205***	0.187***	0.201***	
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	
Unemployment	0.007	0.003	0.007	0.003	0.009	-0.009	-0.003	-0.010	-0.001	-0.014
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Speech	-0.003**	-0.002	-0.003	-0.001	-0.003**	-0.001	-0.003	-0.001	-0.003**	-0.003*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Transparency	0.069	0.036	0.069	0.035	0.076*	0.045	0.108**	0.043	0.115***	0.019
	(0.04)	(0.06)	(0.04)	(0.06)	(0.04)	(0.06)	(0.04)	(0.06)	(0.04)	(0.05)
Interest Level	-0.071*	-0.083**	-0.071*	-0.083**	-0.105***	-0.159***	-0.151***	-0.159***	-0.172***	-0.040
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)	(0.05)
Inflation Target		0.303		0.313		0.508		0.526		
		(0.32)		(0.33)		(0.33)		(0.34)		
Forward Guidance			0.034	-0.105			0.048	-0.196		
			(0.72)	(0.74)			(0.77)	(0.77)		
Money Growth					0.036*				0.008	
					(0.02)				(0.02)	
Turnover						0.031	0.237	0.014	0.262	
						(0.76)	(0.77)	(0.77)	(0.87)	
Output gap										0.606***
										(0.21)
N	882	882	882	882	868	911	911	911	897	702
Countries	60	60	60	60	60	61	61	61	61	50
R2	0.63	0.64	0.63	0.64	0.67	0.58	0.56	0.58	0.57	0.60

Cross-sectional regressions with standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and dummies are not shown in the table). All variables on the right-hand side are lagged by one year.

Table 13 summarizes the outcome from the system GMM one-step estimator excluding time fixed effects. Results do not change.

Table 13: Managers' opinion on central bank policy – Robustness – GMM one-step estimator excluding time fixed effects

	"Central bank policy has a positive impact on economic development."									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IMD Survey	0.636***	0.636***	0.637***	0.637***	0.635***	0.660***	0.659***	0.659***	0.666***	0.633***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)
Inflation	0.013	0.013	0.013	0.013	-0.001					0.020
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)					(0.02)
Growth	0.031***	0.031***	0.030***	0.030***	0.023**	0.024**	0.023**	0.023**	0.017*	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
Unemployment	0.022	0.022	0.022	0.022	0.012	0.036	0.034	0.036	0.018	-0.000
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Speech	-0.001***	-0.001**	-0.002***	-0.002***	-0.001***	-0.002***	-0.002***	-0.002***	-0.001***	-0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Transparency	0.006	0.006	0.005	0.006	0.011	0.018	0.016	0.018	0.024	0.007
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Interest Level	-0.031*	-0.031*	-0.032*	-0.032*	-0.009	-0.032**	-0.033**	-0.033**	-0.023	-0.035
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Inflation Target		-0.004		-0.008		-0.007		-0.010		
		(0.10)		(0.10)		(0.12)		(0.12)		
Forward Guidance			0.077	0.078			0.035	0.035		
			(0.09)	(0.09)			(0.10)	(0.10)		
Money Growth					0.005*				0.005*	
					(0.00)				(0.00)	
Turnover						0.033	0.032	0.032	0.046	
						(0.07)	(0.07)	(0.07)	(0.07)	
Output gap										0.063***
										(0.01)
N	879	879	879	879	865	908	908	908	894	700
Countries	59	59	59	59	59	60	60	60	60	50
No. of instruments	38	39	39	40	45	33	33	34	39	38
AR1 (p-value)	1.09e-08	1.00e-08	1.06e-08	9.65e-09	2.01e-08	6.42e-09	6.52e-09	6.26e-09	5.42e-09	0.000000269
AR2 (p-value)	0.376	0.374	0.371	0.367	0.388	0.493	0.491	0.487	0.411	0.558
Hansen-J (p-value)	0.0428	0.0399	0.0418	0.0390	0.0792	0.0558	0.0552	0.0525	0.0659	0.121

GMM one-step estimator excluding time fixed effects with standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and dummies are not shown in the table). IMD Survey shows the coefficient for the lagged survey response. All variables on the right-hand side are lagged by one year.

Table 14 shows regressions using a dummy variable for emerging market countries based on the country classification of the IMF World Economic Outlook.[61]

Table 14: Managers' opinion on central bank policy and real variables with emerging markets dummy

	"Central bank policy has a positive impact on economic development."													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Inflation	-0.052*	-0.052**	-0.051*	-0.051**	-0.053*									-0.072*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)									(0.04)
Inflation × EM Dummy	0.045	0.048*	0.044	0.047*	0.041									0.059
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)									(0.04)
Growth	0.073***	0.073***	0.070***	0.070***	0.071***	0.073***	0.071***	0.071***	0.072***	0.073***	0.071***	0.071***	0.072***	
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	
Growth × EM Dummy	-0.009	-0.009	-0.008	-0.007	-0.016	-0.017	-0.016	-0.015	-0.016	-0.017	-0.016	-0.015	-0.016	
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	
Unemployment	-0.096***	-0.098***	-0.099***	-0.101***	-0.095***	-0.090***	-0.092***	-0.093***	-0.087***	-0.090***	-0.092***	-0.093***	-0.087***	-0.132***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Unemployment × EM Dummy	0.027	0.022	0.030	0.025	0.024	0.067	0.075	0.070	0.072	0.067	0.075	0.070	0.072	0.061*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.03)
Speech	-0.004***	-0.003***	-0.004***	-0.004***	-0.004***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Speech × EM Dummy	0.008	0.009	0.008	0.009*	0.008	0.010*	0.009	0.010*	0.009	0.010*	0.009	0.010*	0.009	0.010
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Transparency	-0.110	-0.115	-0.115	-0.120	-0.113	-0.085	-0.087	-0.089	-0.083	-0.085	-0.087	-0.089	-0.083	-0.140
	(0.09)	(0.08)	(0.09)	(0.08)	(0.09)	(0.09)	(0.10)	(0.09)	(0.09)	(0.09)	(0.10)	(0.09)	(0.09)	(0.10)
Transparency × EM Dummy	0.067	0.026	0.071	0.030	0.076	0.033	0.084	0.037	0.091	0.033	0.084	0.037	0.091	0.099
	(0.11)	(0.10)	(0.11)	(0.10)	(0.11)	(0.10)	(0.12)	(0.11)	(0.12)	(0.10)	(0.12)	(0.11)	(0.12)	(0.12)
Interest Level	-0.091*	-0.090**	-0.089*	-0.088*	-0.096*	-0.121**	-0.120**	-0.119**	-0.127**	-0.121**	-0.120**	-0.119**	-0.127**	-0.107*
	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Interest Level × EM Dummy	0.071	0.072	0.069	0.071	0.082	0.098**	0.094*	0.096**	0.110**	0.098**	0.094*	0.096**	0.110**	0.092
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)
Inflation Target		0.131		0.133		0.095		0.097		0.095		0.097		
		(0.35)		(0.36)		(0.34)		(0.35)		(0.34)		(0.35)		
Inflation Target × EM Dummy		0.440		0.435		0.521		0.518		0.521		0.518		
		(0.47)		(0.48)		(0.51)		(0.51)		(0.51)		(0.51)		
Forward Guidance			0.132	0.127			0.112	0.107			0.112	0.107		
			(0.21)	(0.21)			(0.21)	(0.21)			(0.21)	(0.21)		
Forward Guidance × EM Dummy			0.000	0.000			0.000	0.000			0.000	0.000		
			(.)	(.)			(.)	(.)			(.)	(.)		
Money Growth					0.006				0.006				0.006	
					(0.00)				(0.01)				(0.01)	
Money Growth × EM Dummy					-0.004				-0.009				-0.009	
					(0.01)				(0.01)				(0.01)	
Turnover						-0.050	-0.037	-0.043	-0.050	-0.050	-0.037	-0.043	-0.050	
						(0.07)	(0.06)	(0.06)	(0.07)	(0.07)	(0.06)	(0.06)	(0.07)	
Turnover × EM Dummy						-0.044	-0.058	-0.052	-0.026	-0.044	-0.058	-0.052	-0.026	
						(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	
Output gap														0.045**
														(0.02)
Output gap × EM Dummy														-0.021
														(0.03)
N	892	892	892	892	878	921	921	921	907	921	921	921	907	710
Countries	60	60	60	60	60	61	61	61	61	61	61	61	61	50
R2	0.31	0.32	0.31	0.32	0.31	0.28	0.28	0.29	0.27	0.28	0.28	0.29	0.27	0.31

Country fixed-effects panel regressions with panel clustered standard errors in parentheses. Significance levels are indicated with asterisks as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
The table shows results for fixed-effects panel regressions for the IMD survey statement "Central bank policy has a positive impact on economic development." We include a dummy for each year (the intercept, country fixed effects, and dummies are not shown in the table). EM Dummy stands for emerging markets dummy. All variables on the right-hand side are lagged by one year.

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[61] See https://www.imf.org/en/Publications/WEO.

Table 15: Countries in our sample and their codes

	Code	Country		Code	Country		Code	Country
1	ARE	United Arab Emirates	22	HKG	Hong Kong SAR	43	NZL	New Zealand
2	ARG	Argentina	23	HRV	Croatia	44	PER	Peru
3	AUS	Australia	24	HUN	Hungary	45	PHL	Philippines
4	AUT	Austria	25	IDN	Indonesia	46	POL	Poland
5	BEL	Belgium	26	IND	India	47	PRT	Portugal
6	BGR	Bulgaria	27	IRL	Ireland	48	QAT	Qatar
7	BRA	Brazil	28	ISL	Iceland	49	ROU	Romania
8	CAN	Canada	29	ISR	Israel	50	RUS	Russia
9	CHE	Switzerland	30	ITA	Italy	51	SAU	Saudi Arabia
10	CHL	Chile	31	JOR	Jordan	52	SGP	Singapore
11	CHN	China	32	JPN	Japan	53	SVK	Slovak Republic
12	COL	Colombia	33	KAZ	Kazakhstan	54	SVN	Slovenia
13	CZE	Czech Republic	34	KOR	Republic of Korea	55	SWE	Sweden
14	DEU	Germany	35	LTU	Lithuania	56	THA	Thailand
15	DNK	Denmark	36	LUX	Luxembourg	57	TUR	Turkey
16	ESP	Spain	37	LVA	Latvia	58	UKR	Ukraine
17	EST	Estonia	38	MEX	Mexico	59	USA	United States of America
18	FIN	Finland	39	MNG	Mongolia	60	VEN	Venezuela
19	FRA	France	40	MYS	Malaysia	61	ZAF	South Africa
20	GBR	United Kingdom	41	NLD	Netherlands			
21	GRC	Greece	42	NOR	Norway			

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