

Noisy politics, quiet technocrats? Central banking in contentious times

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Abstract

In contrast to the ‘quiet’ politics of the pre-2008 period, macroeconomic policy has become ‘noisy’. This break raises a question: How do independent agencies designed for quiet politics react when a contentious public turns the volume up on them? Central banks provide an interesting case because while they are self-professed adherents to communicative transparency, individual case studies have documented their use of strategic silence as a defense mechanism against politicization. This paper provides a quantitative test of the theory that when faced with public contention on core monetary policy issues, central banks are likely to opt for strategic silence. We focus on the most contested of central bank policies: large-scale asset purchase programs, or ‘quantitative easing’ (QE). We examine four topics associated with particularly contested side effects of QE: house prices, exchange rates, corporate debt, and climate change. We hypothesize that an active QE program makes a central bank less likely to address these topics in public, and that the strength of this effect varies depending on the precise composition of asset purchases and on countries’ growth models. Using panel regression analysis on a dataset of more than 11,000 speeches by 18 central banks, we find that as a group, central banks conducting QE programs exhibited strategic silence on house prices, exchange rates, and climate change. We also find support for three out of four central bank-specific hypotheses. These results point to significant technocratic agency in the de- and re-politicization of policy issues.

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1 Introduction

Gone seem the days of steady growth, stable delegation arrangements, and “quiet politics” (Culpepper 2010). Often comparing it to the preceding ‘Great Moderation’ period, scholars have described post-crisis economic governance as more “contested” (Jabko 2019), “contentious” (Bojar et al. 2021), “politicized” (de Wilde and Lord 2016) and “noisy” (Morgan and Ibsen 2021). In this context, delegated authority, designed to shield economic policy-making from political contention, has itself become contentious.

How do independent agencies designed for quiet politics react when the volume is turned up on them? Political scientists studying this question have built on organizational sociology and public administration research on bureaucratic reputation (Carpenter 2010; Gilad, Maor, and Bloom 2015). In being responsive, technocratic bodies face a choice is between directly engaging with politicization attempts, versus blocking engagement and insisting on the purely technical, depoliticized nature of their authority (Bressanelli, Koop, and Reh 2020). Technocratic responsiveness is often straightforward to observe, and has been documented for a number of agencies and policy areas (Rauh 2016; Maor and Sulitzeanu-Kenan 2016; Koop and Lodge 2020). Responsiveness has also been documented for central banks criticized for overreach or, most recently, for being laggards on climate issues (Moschella, Pinto, and Martocchia Diodati 2020; Blondeel, Van Doorslaer, and Vermeiren 2024; Jabko and Kupzok 2024). In light of this evidence, it is tempting to observe the rise of a “responsive regulatory state” (Koop and Lodge 2020).

However, to engage means to acknowledge contention and to validate critics, which carries risks for independent agencies. The alternative is to preempt, evade, or counter politicization. More difficult to observe, these strategies have engendered a smaller literature on “strategic silence”, which has been theorized to be particularly attractive to agencies that enjoy a strong reputation in the relevant policy area (Maor, Gilad, and Bloom 2013; Rimkutė 2020b). While Maor, Gilad, and Bloom (2013) developed and tested it for the case of financial regulation by the Bank of Israel, the strategic silence hypothesis has not been tested for a larger sample of central banks. In this paper, we develop and implement a research design to do conduct a quantitative test of the theory

that when faced with public contention, central banks, rather than engaging their critics in a responsive manner, are more likely to opt for strategic silence.

To do so, we focus on the most contested of central bank policies: large-scale asset purchase programs, or quantitative easing (QE). Initially launched to stabilize financial markets in the immediate wake of the financial crisis of 2008, QE subsequently morphed into a macroeconomic policy, designed to stimulate aggregate demand by pushing down yields on safe assets, thus pushing up asset prices, and by putting downward pressure on the exchange rate, thus boosting exports ([IEO 2019](#)). Excluding the first round of ‘dealer of last resort’ asset purchases, we study the second-generation QE programs conducted by the central banks of the UK, USA, Japan, Sweden, and the euro area from 2011 through 2019. Both the novelty and the stark distributive impacts of QE sparked public contention on a scale that monetary policymakers had not experienced since the stagflation period of the 1970s ([Macchiarelli et al. 2020](#); [Moschella 2024](#)).

We identify four particularly contested side effects of QE: house prices, exchange rates, corporate debt, and climate change. We hypothesize that an active QE program makes a central bank *less* likely to address these topics in public speeches. Moreover, we expect the strength of this effect to vary depending on the precise composition of asset purchases (see Table 1) and on countries’ growth models ([Baccaro and Pontusson 2016](#); [Reisenbichler 2020](#)). In the US, where the Federal Reserve purchased huge amounts of mortgage-backed securities, both factors contributed to housing affordability becoming a sensitive topic; whereas in the UK and Sweden, where QE purchases were concentrated on government debt, it was ‘merely’ the centrality of their highly financialized housing markets for their consumption-led and balanced growth models that made housing a contested topic. In the euro area and in Japan, the pre-dominance of the export-led growth model means that we expect a stronger effect size for the exchange rate topic. Moreover, since asset purchases by the European Central Bank and the Bank of Japan included corporate securities, we expect these central banks to speak less about corporate debt and climate change than their peers in the other three QE countries.¹

¹See section 4 for a detailed explanation of this classification of QE programs.

To test these theoretical propositions, we construct an original data set consisting of 11,243 public speeches delivered by the world’s 18 major central banks between 2000 and 2019. Our results from panel regressions show a significant negative effect for active QE programs on the quantity of central bank communication on all four sensitive topics. We also find evidence in support of three out of four growth-model and QE-design specific hypotheses: In the UK, US, and Sweden, strategic silence was particularly pronounced for house prices; whereas in the euro area and Japan, where asset purchases included corporate securities, strategic silence was more pronounced for corporate debt and climate change. These results are robust to a battery of robustness checks.

Besides the empirical contribution, the paper also makes a methodological and a theoretical contribution. Part of the purpose of delegating authority to independent agencies is to create the conditions for confidential policy-making, which makes it difficult to identify and measure strategic behavior by technocratic actors ([Tortola 2020](#)). To overcome this difficulty, we develop an innovative research design that is applicable to other empirical settings. Theoretically, our findings raise important questions concerning the relationship between democracy and technocratic delegation. If independent agencies seek to safeguard their depoliticized status by downplaying or obscuring politically contentious issues, the normative case for delegation would be weakened ([Dietsch 2020](#); [Downey 2021](#); [van ’t Klooster 2020](#)). What is more, efforts to preempt or stifle public debate may reinforce group think and reduce the quality of policy-making ([Fligstein, Stuart Brundage, and Schultz 2017](#)).

Section two reviews the literature on post-delegation politics and argues that monetary policy is a least-likely setting for strategic silence. Section three introduces quantitative easing as a high-uncertainty, high-salience case. Section four operationalizes our theory of strategic silence and formulates hypotheses regarding the impact of QE on central bank communication. The remaining sections describe our data and method, and present the main results and tests for alternative explanations. We conclude with a brief discussion of the broader implications of our findings for the political economy of delegation.

2 Contention, strategic silence, and central banking

Depoliticization has been defined as “the process of placing at one remove the political character of decision-making” (Burnham 2001, 128). The most common “depoliticization tactic” during the 1990s and early 2000s was via delegation to independent agencies, which spread rapidly across policy areas and countries (Flinders and Buller 2006). Since then, a growing body of research has studied politicization as a dynamic that continues to play out *after* delegation. As noted by Flinders and Buller (2006, 296), issues do not become “any less ‘political’ through the application of depoliticisation tactics.”²

In recent years, students of bureaucratic politics have documented many cases that hardly fit the narrow theoretical frame imposed by principal-agent theory. Often building on the sociological literature on bureaucratic reputation (Carpenter 2010; Hood 2010), they have shown that treating technocratic agencies as actors in their own right, for whom accountability means “sustaining one’s own reputation vis-à-vis different audiences”, yields a better understanding of bureaucratic politics (Busuioc and Lodge 2016, 248). A key finding from this literature is that such agencies, in spite of their nominal independence, are responsive to public contention, both at the national level (Maor, Gilad, and Bloom 2013; Maor and Sulitzeanu-Kenan 2016; Koop and Lodge 2020) and at the supranational level (De Wilde 2011; Busuioc and Jevnaker 2022; Koop, Reh, and Bressanelli 2022). Crucially, this literature has established that independence does not preempt responsive. Indeed, it is precisely when agencies are sufficiently independent to implement policies with far-reaching distributional consequences that contention “through the public and electoral arenas” becomes *more* likely and effective (Onoda 2024, 1352). In short, delegation does not insulate independent agencies from post-delegation contention.

How do agencies react to such contention? Depending on the perceived nature of the threat from contention, depoliticization strategies can be “assertive” or “restrained” (Bressanelli, Koop, and Reh 2020, 335). Moreover, scholars have documented a variety of responses for different types of agencies (Rimkutė 2020a; Maor 2022). For the specific case

²This argument is consistent with the literature on “central bank politics”, which argues that delegation and independence have not made monetary policy any less contentious (Binder and Spindel 2017; Conti-Brown 2016; Jacobs and King 2016).

of central banks, [Maor, Gilad, and Bloom \(2013, 587\)](#), in an important early contribution, have theorized that an agency’s “choice between silence and talk” is determined by the strength of its reputation in the relevant policy area: A strong reputation allows the agency to ignore public pressure, without risking broader damage. Thus, when the banking regulation department of the Bank of Israel was publicly challenged on macroprudential policy, it opted for “strategic silence”, whereas it openly engaged with critics on topics such as consumer protection or fraud ([Maor, Gilad, and Bloom 2013](#)).

While Maor’s theory of strategic silence has since been applied successfully to environmental and regulatory agencies in the United States and the European Union ([Rimkutė 2020b](#)), it has not been tested for a larger group of central banks. Here, his scope conditions of independence and a strong reputation certainly hold. Central bank independence constituted a textbook case of global institutional diffusion, spreading the depoliticization of monetary policy via delegation across the world ([Polillo and Guillén 2005](#)). At the same time, central banks sought to bolster their reputation, notably by investing in “scientization” ([Marcussen 2009](#); [Ibrocevic 2024](#)). With this strategy, central banks built up “epistemic authority” in the fields of monetary economics and macroeconomics ([Mudge and Vauchez 2016](#); [Claveau and Dion 2018](#)). Epistemic authority bolstered their credibility with financial market audiences, while at the same time serving as a moat against criticism from the ‘non-expert’ public.

On the other hand, given central banks’ strong emphasis on communicative transparency, they might be considered a least-likely case for strategic silence. This emphasis accompanied the rise of inflation targeting—a monetary policy regime characterized by “governance through expectations” ([Braun 2015](#); [Wansleben 2018](#)). In the aftermath of the global financial crisis, central banks leaned into this governance technique by embracing “forward guidance”, which extended their communicative reach further into the future ([Braun 2018](#)). From this perspective, it appears unlikely that central banks’ toolkit during this period should include strategic silence.

However, the political economy literature has shown that central banks are no strangers to strategic communication. Indeed, it has been a crucial element of “governing through

expectations” to combine precise and transparent communication on inflation with ambiguity on other topics, such as growth and employment (Best 2005; Braun 2015). The best-known historical example is chairman Paul Volcker’s narrative that the Fed was pursuing a monetary targeting strategy, designed to mask the Fed’s responsibility for skyrocketing interest rates (Krippner 2011, 114-120), and his subsequent hiding of the “uncomfortable knowledge” that the monetarist experiment had failed (Best 2022, 560). An important example from the era of central bank transparency is the “taboo” of monetary financing of public debt (Diessner 2024; Bateman and van ‘t Klooster 2024).

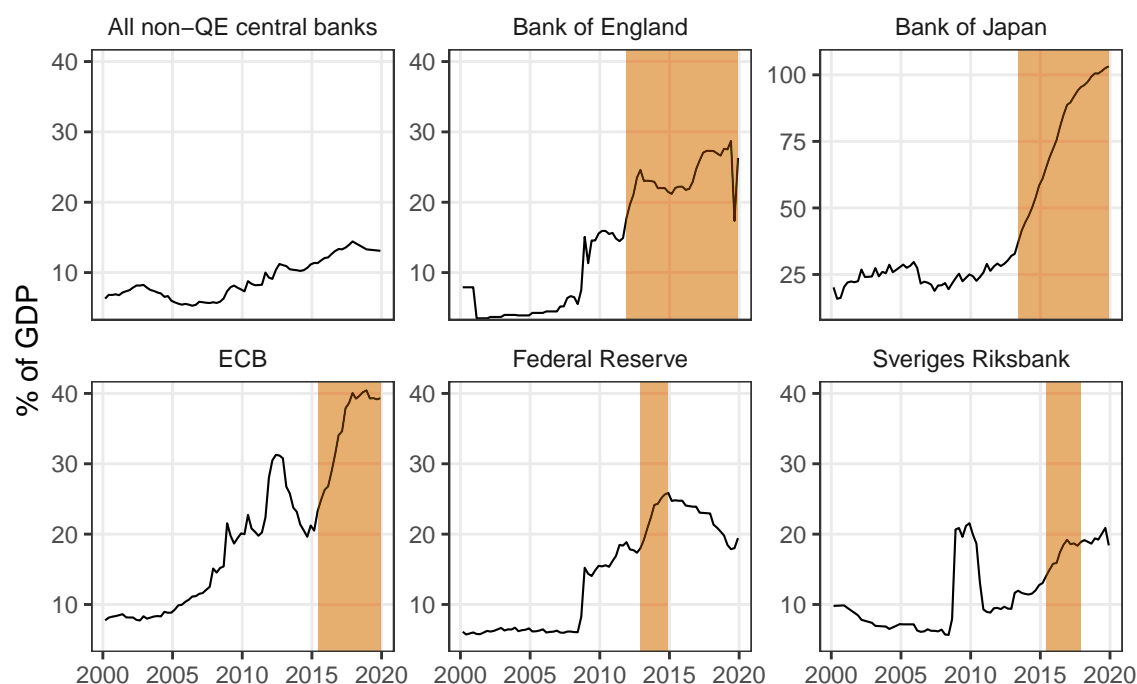
In sum, central banking should not be treated as a least-likely case for strategic silence. However, all available evidence to date stems from qualitative, small-n case studies. We contribute to the literature by studying the communicative behavior of a larger sample of central banks. To do so, we leverage the analytical opportunity presented by the fact that some central banks engaged in quantitative easing, while others did not.

3 The case of quantitative easing

The global diffusion of central bank independence occurred under the benign macroeconomic conditions of the ‘Great Moderation’—a period of exceptionally ‘quiet’ monetary politics. The global financial crisis of 2008 marked a turning point for macroeconomic policy, ushering in an era characterized by “the meltdown of the financial sector, the risk of secular stagnation, and the prospect of prolonged and deep recession” (Moschella 2024, 71-72). This greatly increased the salience of macroeconomic policy in general, and of central banking in particular. In an environment of “noisy politics” (Morgan and Ibsen 2021), it became much more difficult to contain central bank politics within expert circles, and to prevent it from spilling over into the broader political arena (Bertsou and Caramani 2020).

In the wake of the financial crisis, the Fed and the Bank of England launched large-scale asset purchases, soon followed by other central banks. Initially adopted as a financial stability measure, QE subsequently morphed into a macroeconomic policy designed to counter prolonged deflationary pressures (Wansleben 2022). Figure 1 shows the growth

FIGURE 1: Central bank assets as a percentage of GDP



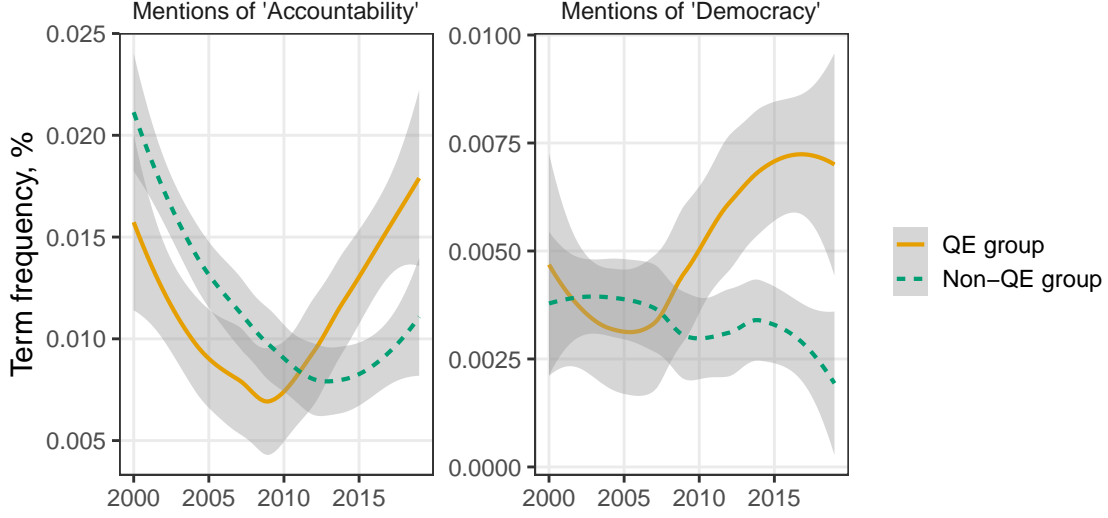
Note: Shaded areas indicate post-2009 QE programs. The first plot shows the unweighted average of 13 non-QE central banks. Where only annual data was available, missing values have been filled in via linear interpolation.

of central bank balance sheets in the post-2008 period. Relative to 2007, the ECB tripled the size of its balance sheet relative to euro-area GDP (QE started in 2015), while the assets held by the Fed and the Bank of England quadrupled (QE started in late 2008 and early 2009, respectively). The Bank of Japan's assets also quadrupled from a much higher base, rising above 100 per cent of GDP (latest QE program activated in mid-2013). Sweden's QE program remained small by comparison.³

The distributional effects of monetary policy became much more pronounced with QE. That is because QE inflates the value of assets, ownership of which is highly unequally distributed. When they conduct asset purchases, central banks push up the prices of the safest securities (sovereign bonds and highly-rated corporate bonds), thereby depressing yields and incentivizing investors to re-balance portfolios towards higher-risk assets, notably equities and (mortgage) loans. In other words, stock and home valuations increase, and households owning those assets become richer (IEO 2019; De Luigi et al. 2023).

³The Swiss National Bank, whose asset purchases were geared exclusively towards foreign assets, is not classified as a QE central bank.

FIGURE 2: ‘Accountability’ and ‘democracy’ in central bank speeches



Note: Term frequencies as a percentage of total number of words. Smoothed conditional means via local polynomial regression fitting.

Notwithstanding the Bank of Japan’s earlier use of asset purchases, quantitative easing “was not anchored in consensual ideas” (Mandelkern 2016, 227). Central banks conducting QE programs operated under exceptionally high levels of epistemic uncertainty (Best 2022; Cassar 2023). Their epistemic authority no longer serving as an effective moat against ‘non-expert’ critics, central banks encountered unprecedented public contention (Moschella 2024, 69-72). This contention ranged from more animated discussions in parliamentary accountability fora (Park, Cheung, and Katada 2022; Fraccaroli et al. 2023), to increased media scrutiny (Koop and di Vettimo 2023), to newly formed grassroots groups—such as Fed Up in the United States and Positive Money in the United Kingdom—giving voice to public discontent (Weber 2018). Moreover, political parties on the right and the left embraced anti-central bank rhetoric (Jones 2019).

A simple way to gauge whether this dramatically increased level of public contention had any impact on central bankers’ public speeches is to track the frequency with which they spoke about “accountability” and “democracy”. As shown in Figure 2, QE central banks mentioned these terms a lot more during the QE period than their non-QE peers. The following section presents a research design to assess how genuine they were.

4 Research design and hypotheses

[Fabo et al. \(2021\)](#) have shown that studies conducted by central bank economists find QE to be *more* effective, and to have *fewer* problematic side effects, than studies produced by academic economists without central bank affiliations. Following their lead, we focus on four specific, particularly contentious side effects of QE: house price inflation; exchange-rate depreciation; corporate debt; and climate change (via the purchase of bonds issued by emission-intensive companies). Our baseline expectation applies to all four of these QE side-effect topics:

Hypothesis 1: *As a group, central banks with active QE programs talk less about contentious, QE-related topics than their non-QE counterparts.*

In order to formulate more fine-grained expectations, we further distinguish between two contributors to the salience of QE side effects: a country’s growth model, and the precise composition of the central bank’s asset purchases. As we shall see, for each side effect, different audiences drive issue salience for central banks.⁴

First, consider growth models. Whether the asset price channel or the exchange rate channel prevails in the transmission of QE depends on the relative contribution to aggregate demand from domestic consumption versus from exports ([Baccaro and Pontusson 2016](#); [Wood and Stockhammer 2024](#)). And while differences in growth models can explain differences in the composition of asset purchases ([Reisenbichler 2020](#)), it is important to note that the transmission mechanism varies between countries *even if* their QE programs were identical. Thus, in the consumption-led growth models of the US and UK, the portfolio channel (via wealth effects) is relatively more important; whereas in export-led economies such as (predominantly) the euro area and Japan, the exchange-rate channel is relatively more important. By definition, both channels matter equally in Sweden’s balanced growth model. It is widely recognized in the literature that the Fed and the Bank of England sought to stimulate domestic demand by boosting asset prices (and thus household wealth); whereas the ECB and the Bank of Japan sought to stimulate export-

⁴We simply note the role of these different audiences—a promising avenue for further research.

led growth (while “importing” inflation) by targeting the exchange rate (Reisenbichler 2020; Van Doorslaer and Vermeiren 2021).⁵

The second driver of issue salience is the composition of asset purchases. A summary is provided in Table 1. While growth models can explain why central banks made those choices, with regard to public backlash we need to treat them as a separate factor. Where a central bank targets a specific asset class, and where that asset class is directly linked to a politically contentious issue, that issue’s salience increases from the perspective of the central bank.

TABLE 1: Key features of quantitative easing programs

	QE periods	Types of assets	Sensitive topics
Bank of England	2011Q4 - 2019Q4	Government bonds	House prices (GM)
Federal Reserve	2012Q4 - 2014Q4	Government bonds, mortgage-backed securities	House prices (GM & QE design)
Bank of Japan	2013Q4 - 2019Q4	Government bonds, corporate bonds, corporate equities	Exchange rates, corporate debt, climate change
Sveriges Riksbank	2014Q4 - 2017Q4	Government bonds	House prices (GM)
ECB	2015Q1 - 2018Q4, 2019Q4	Government bonds, corporate bonds	Exchange rates, corporate debt, climate change

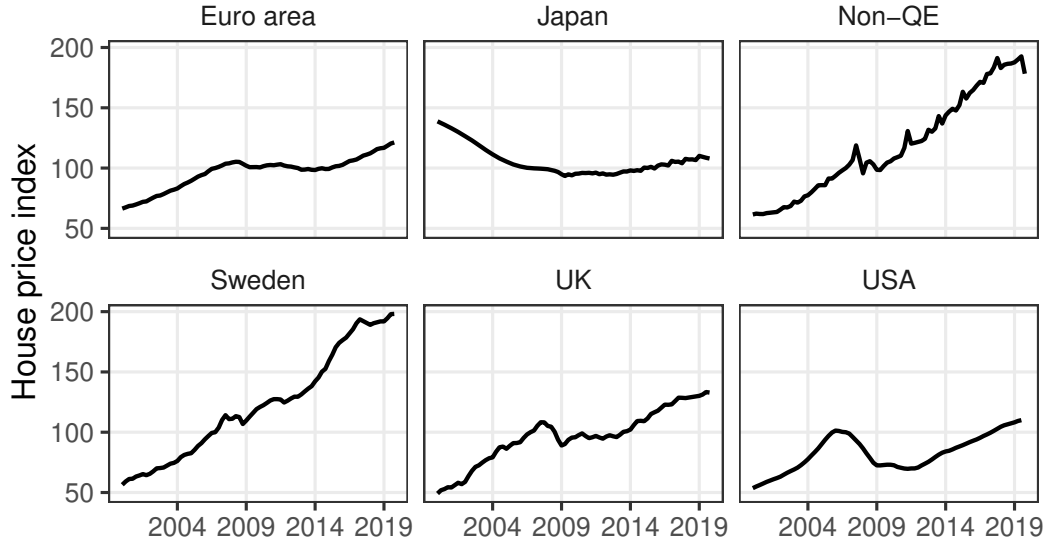
Note on house price topics: ‘GM’ where housing central for growth model; ‘QE design’ where mortgages a major component of asset purchases.

The Federal Reserve was the only central bank whose QE program specifically targeted the housing market on a significant scale (Reisenbichler 2020). Under its ‘QE 3’ program, which lasted from 2012-Q4 until 2014-Q4, the Fed more than doubled its holdings of mortgage-backed securities from just over USD 800 billion to more than USD 1.7 trillion.⁶ On the other hand, only the ECB and the Bank of Japan purchased corporate bonds and,

⁵Finland and the Netherlands have permissive mortgage credit regimes *and* export-led growth models. Even if house prices are more important for their growth performance than has previously been acknowledged (Wood and Stockhammer 2024), the impact of these two countries on ECB monetary policy decisions is small.

⁶The ECB’s cumulative purchase of EUR 28 billion of asset-backed securities—of which the majority mortgage-back—by year-end 2019 can safely be regarded as symbolic.

FIGURE 3: Residential nominal house price index, 2000-2019 (2007 = 100)



Data: Bank for International Settlements.

in the latter's case, corporate equities, on a large scale (Dell'Ariccia, Rabanal, and Sandri 2018).⁷

This leaves us with two groups of QE central banks. On the one hand, the Federal Reserve, the Bank of England, and Sveriges Riksbank conducted QE in countries in which the housing market was central to the growth model. In addition, the Fed purchased mortgage-backed securities directly. We theorize that this group was particularly vulnerable to contention over the contribution of QE to the housing affordability squeeze that made housing such a contentious topic during the QE period. Figure 3 shows the development of residential nominal house prices—at the country-level for the five QE countries; aggregated for the non-QE group. With the exception of Japan, house prices increased steeply during the QE period. Survey data for OECD countries shows a clear upward trend for dissatisfaction with housing affordability, in contrast to other social issues such as health care or public transportation (Romei and Fleming 2024). Thus, the salience of house prices arose from a broad-based perception of an asset price inflation trend favoring richer households over poorer ones.

Hypothesis 2: *Strategic silence on house prices is more pronounced for the Fed, the*

⁷The Bank of England's post-Brexit purchase of GBP 10 billion of corporate bonds can be regarded as insignificant (Bank of England 2022).

BoE, and the Riksbank than for the ECB and the BoJ.

By contrast, we theorize that the ECB and the Bank of Japan were more vulnerable to contention over the exchange rate. This was not due to a specific setting of their QE programs, but because they were widely suspected of seeking to boost their export performance via exchange-rate depreciation.⁸ Here, the salience of the issue is due not to domestic audiences, but to foreign audience. Foreign central banks and governments generally dislike both the beggar-thy-neighbour aspect of competitive exchange rate devaluations and the “spillover effect” in the form of rapid capital inflows. In developing and emerging countries in particular, such inflows tend to be followed by equally rapid capital outflows when core central banks halt or slow down their asset purchases. This global financial cycle is driven, above all, by US monetary policy (Rey 2015). Whereas house price inflation creates a legitimacy challenge for the central bank vis-à-vis domestic audiences, the exchange-rate channel creates a legitimacy challenge primarily vis-à-vis foreign audiences. The unwritten “rules of the game” of international monetary relations include “an international consensus . . . about abstaining from competitive devaluations” (Draghi 2018). In a 2017 FOMC meeting, Fed chair Janet Yellen reminded her colleagues that “we’re very loath to mention the exchange rate” (FOMC 2017, 110). The statements were made after QE by advanced-economy central banks had already provoked accusations, especially from emerging-market central bankers, of currency warfare (Rajan 2015).

Hypothesis 3: *Strategic silence on exchange rate issues is more pronounced for the ECB and the Bank of Japan, who were widely suspected of aiming for competitive exchange rate devaluation.*

Finally, the the ECB and the Bank of Japan were more vulnerable to contention over two issues related to their purchasing of corporate bonds and equities. Most prominent was climate change, which became another major flash point for central banks following the publication of the IPCC (2018) *Special Report on Global Warming of 1.5 °C*. Key

⁸Other things equal, lower bond yields weaken foreign demand for domestic financial assets, putting pressure on the exchange rate.

actors in the global climate movement, including Extinction Rebellion and established groups such as Greenpeace, demanded that central banks “green” their asset purchases by excluding fossil-fuel industries. Although some central banks have recently embraced a more pro-active stance on climate issues, during the period examined here, they resisted pressure from civil society groups, insisting on the need for their interventions to remain “market neutral” (van ’t Klooster and Fontan 2019). Here, too, we expect differences in the composition of asset purchases to impact central banks’ willingness to address the contentious climate issue—only the ECB and the Bank of Japan’s programs included *corporate* bonds and equities.

Hypothesis 4: *Strategic silence on climate issues is more pronounced for the ECB and the Bank of Japan, who purchased corporate bonds and equities.*

In addition, QE raised fears of over-indebtedness in the corporate sector. Private-sector debt had been at the heart of the global financial crisis of 2008, and central banks received much criticism for their “strategic ignorance towards growing amounts of debt” during the run-up to that crisis (Walter and Wansleben 2020, 625). It is not surprising, therefore, that the link between QE and newly rising corporate debt levels became a highly contentious issue for central banks. The most influential source of this criticism was the Bank for International Settlements in Basel, whose 2015 Annual Report—and many subsequent publications—rang the alarm on QE-fueled corporate indebtedness giving rise to so-called “zombie firms” (BIS 2015; Hong, Igan, and Lee 2022). Here, the main driver of issue salience is located within technocratic circles.

Hypothesis 5: *Strategic silence on corporate debt is more pronounced for the ECB and the Bank of Japan, who purchased corporate bonds and equities.*

5 Data and estimation method

Scholars have successfully leveraged interview data (Coombs 2020) or archival documents (Wansleben 2022; Fink 2023) to identify and document strategic communication by central banks. In order to overcome the small-n case study requirement of such approaches,

this paper leverages public speeches, which are available for a large number of central banks and are immediately published online. In the context of the shift towards transparency that accompanied the rise of inflation targeting, public speeches became an key tool for central banks to steer expectations, alongside official announcements and press conferences (Haldane 2017). These speeches serve to “communicate the reasons for domestic institutional choices, increase their legitimacy in front of multiple audiences [...] and facilitate coordination with markets and other regulators” (Thiemann 2019, 566). Speeches occur with sufficient frequency to allow us to aggregate small communicative choices into a larger statistical picture. In using computational text analysis methods on central bank speeches, we follow recent studies on ideational change (Johnson, Arel-Bundock, and Portniaguine 2019; Ferrara 2020), accountability interactions (Fraccaroli et al. 2023), and—closest to our own approach—reputation management (Moschella and Pinto 2019; Moschella, Pinto, and Martocchia Diodati 2020).

Dependent variable

Our dependent variable is the relative intensity of central bank communication on QE-related topics. Our textual corpus consists of 11,243 speeches delivered by central bank officials between 2000 and 2019. Few speeches are available before the year 2000; while 2019, the last year before the onset of the Covid-19 pandemic, marks a natural cut-off point. Our sample size of 18 is the result of including only central banks for which we could obtain at least ten speeches for each year.⁹ Where central banks’ own websites were incomplete, we obtained additional speeches from the online archive maintained by the Bank for International Settlements (see A.1 for an overview).

Table 2 summarizes our preprocessing chain. As suggested by Denny and Spirling (2018, 185), we use theory to choose preprocessing steps suitable to our application.

⁹The corpus includes the following central banks: The Federal Reserve (Fed), European Central Bank (ECB), Bank of England, Bank of Japan, Sveriges Riksbank, Bank of Canada, Reserve Bank of Australia, Reserve Bank of New Zealand, Bank of Israel, South African Reserve Bank, Monetary Authority of Singapore, Monetary Authority of Hong Kong, Bank of Thailand, Reserve Bank of India, Bank of Malaysia, Norges Bank and Central Bank of the Philippines and the Central Bank of the Republic of Turkey. The largest economies whose central banks are absent from our dataset for data availability reasons are China, South Korea, Russia, Brazil, and Mexico.

TABLE 2: Vocabulary and document sets through the preprocessing chain

	Raw speeches	Preprocessing	Paragraph selection	DTM reduction
Vocabulary	205,680	147,164	131,848	26,384
Paragraphs	417,760	417,760	389,408	389,408
Speeches	11,243	11,243	11,218	11,218

First, given our focus on counting specific words via a dictionary-based approach, we need to ensure that denominators for relative words counts are not distorted. Therefore, we removed all non-words (URLs and numbers) from the speeches. Second, we lemmatize in order to reduce the number of permutations of target words that need to be included in our dictionaries, and to reduce the likelihood of missing important permutations.¹⁰ In order to obtain a more fine-grained data structure, we used document tag information to divide speeches into paragraphs (details in appendix Figure 5). Eliminating very short paragraphs consisting of four words or fewer (e.g., a greeting or a page number) and reference lists reduces the total number of paragraphs from 417,760 to 389,408. Before creating the document term matrix (DTM), we also eliminate stop words and terms occurring fewer than ten times across the whole corpus.

To trace topics we use a dictionary-based approach, which brings distinct advantages over alternative approaches. Thanks to a strongly theory-guided research design, our empirical strategy is geared towards tracing a small number of pre-identified topics. Whereas housing and climate take up enough space in central bank speeches in recent years to be traced reliably via topic modeling, private and corporate debt do not, nor does climate change during the 2000s (Johnson, Arel-Bundock, and Portniaguine 2019; Moschella, Pinto, and Martocchia Diodati 2020). And while word-embeddings-based neural network approaches perform mildly better at measuring emotion in political text than dictionary-based analysis methods (Widmann and Wich 2023), our research design does not require the extra step of analysing meaning. Whether central banks speak about the housing with a positive or negative sentiment is immaterial to us. To measure relative quantity of housing talk, the dictionary-based approach offers transparency and robustness.

¹⁰For this task, we used the R packages *SpaCy* and *quanteda* (Benoit et al. 2018).

We constructed dictionaries via a three-step procedure that combines manual and computer-assisted selection of bigrams (King, Lam, and Roberts 2017). First, dictionaries of 10 to 15 highly pertinent uni- and bigrams (see Table A.3 in A.3) served to identify the 20 most relevant speeches for each topic. From this sample we extracted, in a second step, the 250 most frequent bigrams.¹¹ This method ensures that in addition to “house prices”, the relevant dictionary also includes “property prices”, “home prices”, and “real estate prices.” In a final step, misleading or ambiguous bigrams were manually removed, leaving us with 28 to 81 bigrams per dictionary.

We classified each paragraph based on whether it contains topic-specific vocabulary (for summary statistics of dictionary counts, see A.1). The following provides an example of a correctly classified house price paragraph (dictionary words in red):

Household finances and attitudes also have an important influence on the housing market, which has remained depressed, notwithstanding reduced house prices and record-low mortgage rates. The overhang of foreclosed properties and vacant homes remains a significant drag on house prices and residential investment.

— Ben Bernanke, Federal Reserve, October 2010

Word counts for each central bank were aggregated by quarter. To obtain an approximately normally distributed dependent variable, we used paragraph counts in log form.

Explanatory variables

The main explanatory variable is a dummy that switches to 1 when a central bank conducts a QE program. We exclude the Fed’s first two QE programs and the Bank of England’s first program, launched in late 2008 and early 2009, respectively. As noted by the IMF, these first-generation programs were intended and perceived as measures to “support liquidity and preserve financial markets”, whereas subsequent iterations of

¹¹Bigrams capture multi-word expressions such as “interest rate” or “asset price” and perform better than unigrams in leading to the intended context.

QE were designed to “support demand” (IEO 2019, 3). Our theory applies to second-generation QE programs only, whose purpose and goals were explicitly macroeconomic. Shaded areas in Figure 1 highlight the balance sheet impact of those asset purchases; Table 1 summarizes their composition.

To rule out other explanations of communicative patterns, we control for a set of covariates (for a list and sources, see Table A.2). Macroeconomic control variables include the annual consumer price inflation rate, the nominal growth rate of GDP, and the central bank policy interest rate. Some control variables are topic-specific, such as the nominal effective exchange rate (NEER) and residential house prices, both indexed to 2000 = 100.¹² Institutional control variables—notably central bank independence and transparency—show little to no variation for our sample and time period. Including them does not change the main results (see additional regressions in Appendix B.3).

Estimation method

Our panel dataset consists of central banks i and year-quarter time steps t . For the main analysis, we use ordinary least squares (OLS) regression to estimate the following panel regression model:

$$P_{it} = \alpha_t + \phi_i + QE_{it} + \mathbf{X}_{it}'\delta + \epsilon_{it}, \quad (1)$$

where the logged count of relevant paragraphs (P_{it}) is regressed on the QE-indicator (QE_{it}) for each central bank i in a specific quarter t . We include time fixed effects α_t and central bank fixed effects ϕ_i to account for common shocks and central bank-specific characteristics. \mathbf{X}_{it} is a vector of control variables. ϵ_{it} represents the error term. We use heteroscedasticity-robust standard errors.

¹²To obtain legible coefficients, we reduce the magnitude of indexed variables by a factor of 100.

6 Results

Results are shown in Table 3. The baseline model shows that an active QE program has a significant negative effect on the quantity of central bank communication on all sensitive topics, providing solid support for hypothesis 1. Due to our log-linear model, a minor transformation is necessary to interpret coefficients: The effect of an active QE program on central bank communication on house prices is computed by $e^{-0.353} = 0.703$, which translates into an average reduction in the number of house price paragraphs per quarter of 29.7%. For the exchange rate topic, the decrease is 40.2% ($e^{-0.514} = 0.598$), for climate change 37.3% ($e^{-0.467} = 0.627$), and for corporate debt 15% ($e^{-0.163} = 0.85$).

TABLE 3: Determinants of central bank communication on contentious topics (OLS)

	House prices		Exchange rate		Climate change		Corporate debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
QE	-0.353*** (0.109)	-0.525*** (0.147)	-0.514*** (0.065)	-0.255*** (0.089)	-0.467*** (0.096)	-0.739*** (0.117)	-0.163* (0.091)	-0.104 (0.108)
Inflation rate (% change of CPI)		-0.034 (0.034)		-0.010 (0.031)		-0.018 (0.027)		-0.008 (0.022)
Interest rate (%)		-0.004 (0.022)		0.033* (0.020)		0.006 (0.018)		-0.022* (0.013)
GDP growth rate (log)		0.199 (0.367)		0.821*** (0.298)		-0.359 (0.258)		-0.214 (0.068)
Financial dev. index		-0.523 (0.760)		0.729 (0.644)		0.756 (0.674)		-0.647 (0.484)
Property prices		0.010 (0.065)						
Nominal effective exchange rate				0.036 (0.206)				
Number of paragraphs	0.002*** (0.0002)	0.002*** (0.0002)	0.002*** (0.0002)	0.003*** (0.0002)	0.001*** (0.0002)	0.002*** (0.0002)	0.001*** (0.0001)	0.001*** (0.0001)
Central bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Central banks	18	18	18	18	18	18	18	18
Observations	1,326	998	1,326	1,017	1,326	1,017	1,326	1,017
Adjusted R ²	0.555	0.608	0.569	0.641	0.359	0.416	0.328	0.347

Note: Standard errors are corrected for heteroscedasticity.

*p<0.1; **p<0.05; ***p<0.01

After incorporating control variables, the observed results remain consistent. The effect sizes exhibit notable increases for the topics of house prices, climate change, and private debt, whereas a decrease is observed for the exchange rate topic. The significance

of the QE effect for the private debt topic increases to the 0.01% level, suggesting a robust relationship.

We subject these findings to a battery of robustness checks, presented in Appendix B. Results are robust to sample variations (Tables B.8, B.9, B.10); additional institutional control variables, notably central bank transparency and independence (Tables B.11, B.12, B.13, B.14); and alternative methods of topic measurement. Modelling the dependent variable (the number of relevant paragraphs) as count data and using quasi-Poisson panel regressions with an estimated variance parameter confirms the OLS results (B.1). We also perform an event study analysis, which indicates that strategic silence is more front-loaded for the exchange rate—which tends to adjust instantly to QE announcements—versus cumulative for house prices and corporate debt—which increase over time (see B.4).

To test the more specific hypotheses 2-5, we run two sets of models that interact the QE dummy with different central bank pairs. To test whether the strategic silence effect on house prices is stronger for the three QE countries with consumption-led and balanced growth models (one of which—the US—with a QE program explicitly targeting mortgage backed securities) (hypothesis 2), we interact the QE dummy with the Fed, the Bank of England, and Sveriges Riksbank ('Fed-BoE-Riks'). Interacting the QE dummy with the ECB and a Bank of Japan ('ECB-BoJ'), we test whether the exchange-rate effect is driven by countries with export-led growth models (hypothesis 3, and whether the climate-change and corporate debt effects are driven by central banks whose asset purchases include corporate bonds and equities, and thus the securities of carbon-intensive companies (hypotheses 4 and 5). Table 4 summarizes the results.

Results from the interaction model reinforce the results of the simple OLS regression. Once controls are included (even-numbered columns), the 'Fed-BoE-Riks' interaction term shows a strongly significant negative effect of QE on communication about house prices (60%, $e^{-0.924} = 0.4$). The QE programs of the ECB and the Bank of Japan, which targeted corporate securities, do have significant negative effects on the quantity of communication on climate change (37.5%, $e^{-0.470} = 0.625$) and corporate debt (34.6%, $e^{-0.424} = 0.654$). By contrast, although the QE programs of the ECB and the Bank of Japan have been

TABLE 4: Central bank-specific determinants of communication on contentious topics

	House prices		Exchange rate		Climate change		Corporate debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
QE	−0.109 (0.127)	0.096 (0.195)	−0.558*** (0.114)	−0.414*** (0.119)	−0.181 (0.139)	−0.566*** (0.136)	0.053 (0.121)	0.053 (0.133)
Fed-BoE- Riks	0.292** (0.141)	1.675 (1.174)						
ECB-BoJ			0.511*** (0.100)	4.893*** (1.475)	0.678*** (0.122)	−1.152 (1.249)	−1.248*** (0.116)	−1.248 (0.829)
QE x Fed- BoE-Riks	−0.481 (0.217)	−0.924*** (0.243)						
QE x ECB-BoJ			0.090 (0.134)	0.423*** (0.158)	−0.581*** (0.194)	−0.470** (0.228)	−0.424** (0.180)	−0.424** (0.204)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1,326	998	1,326	1,017	1,326	1,017	1,326	1,017
Adjusted R ²	0.557	0.613	0.569	0.643	0.363	0.419	0.565	0.565

Note: Standard errors are corrected for heteroscedasticity.

*p<0.1; **p<0.05; ***p<0.01

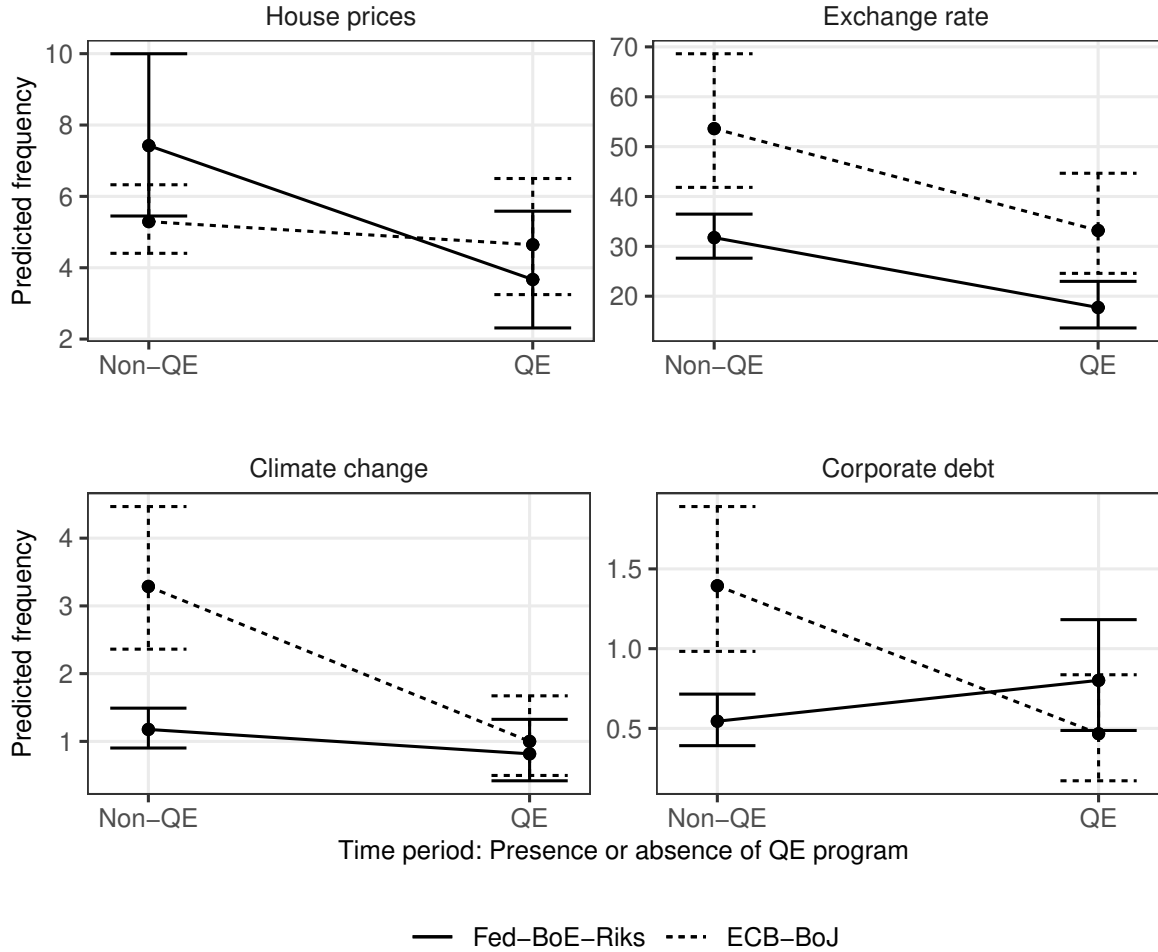
Note: All models with central bank fixed effects. Controls as in Table 3. Results with all covariates in Table B.15.

described as partly aimed at the exchange rate to boost export-led growth, the effect of QE on the quantity of communication about the exchange rate is positive. This runs against hypothesis 3—the other three QE central banks appear to have been more “loath to mention the exchange rate” than the ECB and the Bank of Japan even while the latter engaged in competitive devaluation.

To further illustrate these results, Figure 4 visualizes the marginal effects of the QE–central bank interactions for the baseline specification without controls. The y-axis shows the predicted frequency of central bank talk about the four topics. This frequency is predicted for non-QE times versus QE times, displayed on the x-axis. The solid lines represent the predicted frequencies for the Federal Reserve, the Bank of England, and Sveriges Riksbank, the dotted lines for the ECB and the Bank of Japan. The first plot (top-left) shows that whereas the ‘Fed-BoE-Riks’ group communicated *more frequently* than their peers about house prices while not conducting asset purchases, they mentioned these topics *less* frequently while conducting QE programs. The plot showing results from the baseline specification without controls, this marginal effect just misses the threshold

for statistical significance, which in the plot is indicated by the slight overlap of the solid line's error bars. By contrast, as shown in the two bottom plots, the ECB and the Bank of Japan reduced their communication about climate change and corporate debt while conducting asset purchases (dotted-line error bars do not overlap).

FIGURE 4: Marginal effects of interactions



7 Additional tests

To further explore our results and to address potential objections, we can use the same dictionary approach and regression specification on adjacent topics for which we do *not* expect strategic silence—share prices and macroprudential regulation. The finding of strategic silence on house prices would be weakened if central banks with active QE programs

reduced their communication on *all* asset prices. The theoretical rationale underpinning hypothesis 2 is that house price inflation is special in that it creates housing affordability problems for renters and first-time buyers. This affordability problem should not be a concern for stock price inflation, which does not create clearly identifiable losers.¹³ The results presented in Table 5 support this intuition—with controls included, the QE effect on the quantity of central bank communication on share prices is small and insignificant.

TABLE 5: Effect of QE on central bank communication on two alternative topics

	Share prices		Macroprudential	
	(1)	(2)	(3)	(4)
QE	−0.149* (0.086)	0.050 (0.111)	0.782*** (0.108)	0.388*** (0.119)
Inflation rate		0.001 (0.028)		−0.039 (0.032)
Interest rate		−0.016 (0.017)		−0.003 (0.020)
GDP growth (log)		0.549** (0.223)		0.438 (0.267)
Financial development		0.061 (0.665)		−0.154 (0.704)
Number of paragraphs	0.002*** (0.0002)	0.002*** (0.0002)	0.002*** (0.0002)	0.002*** (0.0001)
Central Bank FE	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes
Observations	1,326	1,017	1,326	1,017
Adjusted R ²	0.644	0.680	0.494	0.659

*p<0.1; **p<0.05; ***p<0.01

Another potential objection is that strategic silence on house prices reflects a discursive pivot towards a different vocabulary. Central banks could have communicated about house prices without directly mentioning this contentious term. The most likely candidate for such an alternative discourse is macroprudential regulation. In the wake of the global financial crisis, the macroprudential paradigm—which assigns a central role

¹³The delicacy of this distinction for central bankers is illustrated by Ben Bernanke’s wavering explanation of the portfolio rebalancing channel of QE, in which he applied one logic to stocks—whose price increase “will boost consumer wealth and help increase confidence”—and the opposite logic to houses, where “lower mortgage rates will make housing more affordable” (Ronkainen and Sorsa 2018, cited on p. 716). Contrary to Bernanke’s statement, most observers take it as a given that QE pushes up the valuation of both types of assets, stocks and houses.

to asset prices, including house prices—emerged as a new master framework for systemic financial regulation (Lepers and Thiemann 2024). Indeed, the results displayed in Table 5 show a significant *positive* correlation between active QE programs and central bank communication about macroprudential regulation (0.386, $p < 0.01$). This suggests that strategic silence on house prices could, in part, be the result of central banks having found a way to talk about house prices without mentioning house prices.

8 Conclusion

Central banks conducting QE programs faced intense *public* contention. That does not imply, however, that central banks respond via direct engagement. Testing several variants of the strategic silence hypothesis, we find that central bankers with active QE programs speak less about politically sensitive, QE-associated topics, notably house prices, exchange rates, climate change, and private debt. These results are robust to changes in sample selection, regression model, and institutional control variables.

Interacting the QE dummy with individual central banks shows that effect strength varies as expected. Strategic silence on house prices is driven by countries with central banks buying mortgage-backed securities (US) and/or with financialized housing markets and consumption-led (UK and US) or balanced growth models (Sweden); whereas strategic silence on corporate debt and climate change is driven by central banks targeting corporate securities (ECB and Bank of Japan). We also show that there is no effect for share prices, consistent with the idea that unlike house price inflation, share price inflation does not create an affordability problem. A positive effect of QE on communication on macroprudential regulation indicates that central banks may have adopted this technical language to avoid politically more sensitive phrases such as “house price inflation.”

Our analysis is limited to a specific mode of engagement with public contention. In particular, we do not examine the conditions under which strategic silence can no longer be sustained. There are strong indications that towards the end of our sample period, strategic silence on the side effects of QE became increasingly untenable, and started to give way to head-on engagement on certain topics. This is certainly true for climate

change, which central banks have, to varying degrees, integrated into their monetary policy frameworks (Deyris 2023; DiLeo 2023; Blondeel, Van Doorslaer, and Vermeiren 2024; Jabko and Kupzok 2024; Massoc 2024). Similarly, public contention surrounding the distributive impact of its policies have contributed to the Fed’s rebalancing of its mandated goals of price stability and maximum employment (Arbogast, Van Doorslaer, and Vermeiren 2023).

This suggests that when salience remains high over significant periods, strategic silence is bound to give way to head-on engagement—even on topics at the core of technocratic delegation arrangements. At the same time, these engagement efforts came late, and often coincided with central banks beginning to shrink their asset portfolios. Up to that point, central banks had engaged in rearguard action in the form of strategic silence. Identifying the determinants of these shifts from one mode of engagement to another should be a fruitful avenue for future research.

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A Appendix

A.1 Central bank speech dataset

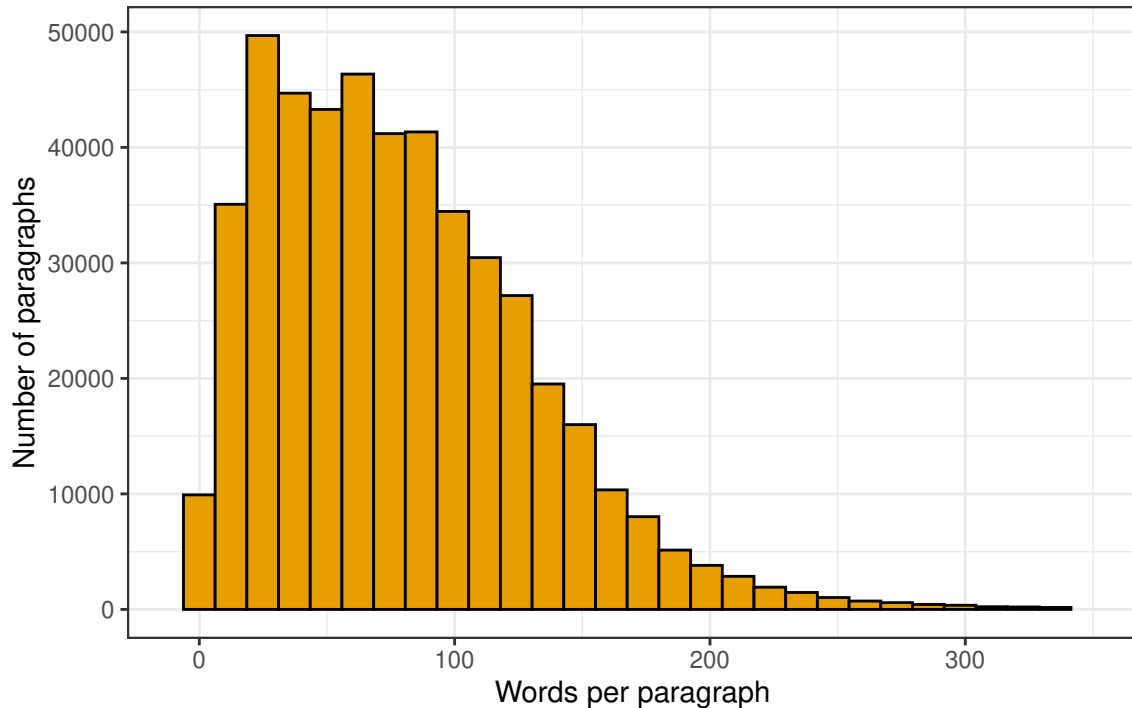
Table A.1 provides a breakdown of the content of the speech dataset. We have sourced 11,243 speeches from 18 central banks, covering the period from 2000 to 2019. For all but the Central Bank of Malaysia, we have sourced speeches directly from the respective central banks’ websites (Source: ‘Local’). Those collections were then augmented with speeches downloaded from the the repository of the Bank for International Settlements (‘BIS’). The column ‘From BIS’ indicates the number of speeches taken of the BIS repository to supplement the locally gathered speeches.

TABLE A.1: Descriptive statistics for the speech dataset

	Speeches	Speeches per quarter			Sources	From BIS
		min	median	max		
European Central Bank (QE)	2151	8	27	52	Local	0
Federal Reserve (QE)	1430	4	17	37	Local	0
Bank of England (QE)	919	1	11	33	Local	0
Bank of Japan (QE)	836	1	10	18	Local & BIS	521
Sveriges Riksbank (QE)	442	1	5	15	Local & BIS	385
Reserve Bank of India	1084	1	11	60	Local	729
Mon. Authority of Singapore	797	3	9	29	Local	0
Reserve Bank of Australia	582	2	7	15	Local	0
Bank of Canada	504	2	6	11	Local & BIS	400
C. B. of Malaysia	477	1	6	17	BIS	477
C. B. of the Philippines	394	1	7	19	Local & BIS	296
South African Reserve Bank	392	1	4	15	Local & BIS	272
Norges Bank	313	1	4	10	Local	227
Hong Kong M. A.	235	1	3	7	Local & BIS	165
Bank of Thailand	234	1	3	10	Local & BIS	196
Bank of Israel	208	1	3	8	Local & BIS	96
R. B. of New Zealand	163	1	2	6	Local & BIS	116
Central Bank of Turkey	82	1	1	6	Local & BIS	82

Figure 5 depicts the length of paragraphs measured by the number of words. The median paragraph length is 76 words.

FIGURE 5: Length of Paragraphs



A.2 Summary statistics of control variables

TABLE A.2: Descriptive statistics for control variables

Variable	Obs.	Min	Median	Max	SD	Source
CPI inflation rate, %	1279	-3.5	0.49	5.4	0.85	BIS
Policy interest rate	1202	-0.5	3	19	3	BIS
Nominal effective exchange rate	1326	0.49	0.99	3.3	0.18	BIS
Nominal GDP growth	1182	-0.18	0.0067	0.28	0.027	Datastream
Share price index	1326	0.41	1.3	7.5	1.4	Datastream
Financial dev. index	1264	0.32	0.7	0.96	0.16	Svirydzenka (2016)
CB bank supervisor	918	0	1	1	0.49	Masciandaro and Romelli (2018)
Transparency index	1059	3.5	10	14	2.4	Dincer and Eichengreen (2014)
Independence index	1067	0.14	0.48	0.93	0.19	Romelli (2022)

A.3 Dictionaries

We constructed dictionaries via a three-step procedure.

Step 1: We manually compiled dictionaries of 10 to 15 highly pertinent uni- and bigrams.

TABLE A.3: Initial, manually generated dictionaries

House prices	Exchange rate	Climate change	Corporate debt	Share prices	Macroprudential
property price	exchange rate	carbon	corporate debt	stocks	macroprudential
house price	devaluation	environment	corporate bond	stock market	prudential
land price	devalue	environmental	corporate leverage	stock price	regulation
home price	appreciation	sustainability		stock valuation	debt
real estate	currency	sustainable		stock value	systemic risk
rent price	export price	climate change		equity	financial cycle
residential	competitiveness	climate neutral		equities	procyclical
		climate risk		bull market	countercyclical
		impact climate		dividend	credit cycle
		stranded asset		buyback	leaning against
		greenhouse		basel	loan value
		fossil		buffers	
				capital requirement	
				regulatory capital	

Step 2: The manually compiled dictionaries served to identify the 20 most relevant speeches for each topic, listed in Table A.4 below.

TABLE A.4: Speeches used for dictionary creation

Topic	Central bank	Date	Speaker	Title of speech
House prices	Fed	17.01.2007	Frederic S. Mishkin	The role of house prices in formulating monetary policy
	ECB	24.11.2011	Peter Praet	Housing cycles and financial stability – the role of the policymaker
	Fed	19.11.2008	Donald L. Kohn	Monetary policy and asset prices revisited
	Sveriges Riksbank	20.09.2004	Irma Rosenberg	Monetary policy, house prices and household indebtedness
	Fed	03.01.2010	Ben S. Bernanke	Monetary policy and the housing bubble
	Bank of India	20.08.2014	R. Gandhi	Real estate and housing – a sensitive sector or Samvridhdi sector?
	Bank of England	14.09.2004	Stephen Nickell	Household Debt, House Prices and Consumption Growth
	R. B. of New Zealand	02.09.2004	Alan Bollard	What's happening in the property sector?
	Bank of England	24.01.2005	Kate Barker	The Housing Market and the Wider Economy
	Bank of Canada	25.08.2015	Lawrence Schembri	The long-term evolution of house prices – an international perspective
	Bank of England	14.11.2013	David Miles	Housing, leverage and stability in the wider economy
	Bank of Canada	15.06.2011	Mark Carney	Housing in Canada
	Fed	11.07.2017	Lael Brainard	Cross-Border Spillovers of Balance Sheet Normalization
	Fed	12.11.2015	Stanley Fischer	The transmission of exchange rate changes to output and inflation
Exchange rate	Fed	07.03.2008	Frederic S. Mishkin	Exchange rate pass-through and monetary policy
	Fed	14.04.2004	Ben S. Bernanke	International monetary reform and capital freedom
	ECB	03.11.2017	Benoît Coeuré	Monetary policy, exchange rates and capital flows
	ECB	11.07.2017	Benoît Coeuré	The international dimension of the ECB's asset purchase programme
	Bank of Japan	20.01.2017	Hiroshi	Monetary Policy Divergence and Global Financial Stability
	Bank of England	11.09.2015	Kristin Forbes	Much ado about something important
	Bank of England	31.05.2000	Sushil Wadhvani	The Exchange Rate and the MPC: What can we do?
	Sveriges Riksbank	13.06.2011	Karolina Ekholm	Do global imbalances pose a risk to the Swedish economy
	Sveriges Riksbank	29.10.2003	Kristina Persson	The impact of the euro
	Norges Bank	29.04.2004	Svein Gjedrem	The krone exchange rate and competitiveness in the business sector
	R. B. of New Zealand	22.11.2013	John McDermott	Understanding the New Zealand exchange rate
	Bank of Israel	15.11.2007	Stanley Fischer	Exchange rate systems, surveillance, and advice
	R. B. of Australia	21.11.2013	Glenn Stevens	The Australian dollar – thirty years of floating
	Bank of Canada	19.11.2013	John Murray	Price puzzles and the exchange rate
Climate change	Bank of Japan	16.03.2006	Toshihiko Fukui	New framework for the conduct of monetary policy
	Bank of England	22.09.2016	Mark Carney	Resolving the climate paradox
	Sveriges Riksbank	16.09.2013	Lars E. O. Svensson	Monetary policy and employment – monetary policy is too tight
	Bank of Thailand	02.08.2008	Bandid Nijathaworn	Is climate change a big deal for the financial system?
	Bank of Malaysia	26.02.2000	Zeti Akhtar Aziz	Globalisation and Open Market - Challenges for Bumiputera Entrepreneurs
	Hong Kong M. A.	29.11.2000	David Carse	Environmental issues and their implications for financial institutions
	Bank of Turkey	12.04.2005	Süreyya Serdengeçti	Basic changes in the Turkish economy - problems and solutions
	Sveriges Riksbank	08.06.2012	Lars E. O. Svensson	Differing views on monetary policy
	Bank of England	29.09.2015	Mark Carney	Breaking the Tragedy of the Horizon – climate change and financial stability
	Bank of Canada	02.03.2017	Timothy Lane	Thermometer rising - climate change and Canada's economic future
	Bank of India	17.10.2014	G. Padmanabhan	Corporate sustainability a panacea for growth – values, convictions and actions
	Bank of India	23.04.2013	K. C. Chakrabarty	Environmental and social sustainability – key issues and concerns
	Norges Bank	09.04.2019	Jon Nicolaisen	Will debt be reduced?
	Fed	30.09.2004	Susan S. Bies	Developments in Financial Markets and Financial Management
Corporate debt	Fed	26.02.2004	Susan S. Bies	The Economic Outlook and the State of Household and Business Finances
	Fed	23.10.2004	Susan S. Bies	The Federal Reserve System and the Economy
	Sveriges Riksbank	21.08.2014	Kerstin af Jochnick	Low inflation and high indebtedness
	Sveriges Riksbank	07.06.2013	Per Jansson	Perspectives on the Riksbank's monetary policy
	Norges Bank	28.11.2007	Svein Gjedrem	Interest rate developments
	Bank of Malaysia	02.01.2004	Zeti A. Aziz	Malaysia - encouraging savings in a dynamic economy
	Bank of England	27.01.2010	Andrew G. Haldane	The Debt Hangover
	Bank of England	23.01.2019	Ben Broadbent	Debt dynamics

TABLE A.5: Speeches used for dictionary creation

Topic	Central bank	Date	Speaker	Title of speech
Share prices	Fed	02.10.2003	Ben S. Bernanke	Monetary policy and the stock market - some empirical results
	Bank of England	04.04.2014	Andrew G. Haldane	The age of asset management?
	Bank of India	12.11.2009	Deepak Mohanty	Global financial crisis and monetary policy response in India
	ECB	13.01.2006	Jean-Claude Trichet	The process of European financial integration: where do we stand?
	Bank of England	26.04.2007	Paul Tucker	A Perspective on Recent Monetary and Financial System Developments
	ECB	12.03.2013	Benoît Coeuré	The way back to financial integration
	ECB	16.12.2005	Jean-Claude Trichet	European financial integration
	Norges Bank	11.03.2003	Jarle Berge	Oil - economic policy challenges
Macroprou	Fed	09.05.2000	Roger W. Ferguson, Jr.	Conversation with leaders of the "New Economy"
	Bank of Japan	16.05.2009	Kiyohiko G Nishimura	Financial system stability and market confidence
	Norges Bank	07.11.2006	Jarle Berge	The Norwegian economy and financial stability
	R. B. of New Zealand	25.03.2011	Alan Bollard	Where we are going with macro- and microprudential policies in New Zealand
	ECB	26.04.2016	Vitor Constâncio	Principles of macroprudential policy
	ECB	25.09.2009	Lorenzo Bini Smaghi	Macro-prudential supervision
	ECB	28.10.2015	Vitor Constâncio	Macroprudential policy in Europe – ensuring financial stability in a banking union
	Sveriges Riksbank	19.11.2015	Stefan Ingves	The housing market and household indebtedness from a central bank perspective
	Bank of England	16.09.2003	Stephen Nickell	Two Current Monetary Policy Issues
	Fed	04.04.2017	Daniel K. Tarullo	Departing Thoughts
	Bank of Sweden	12.06.2013	Stefan Ingves	The role of the central bank after the financial crisis – the challenges ahead
	Bank of India	06.09.2012	Anand Sinha	Financial stability: 2007 to 2012 – five years on
	Bank of India	03.03.2012	B. Mahapatra	Implications of Basel III for capital, liquidity and profitability of banks
	Fed	18.06.2003	Roger W. Ferguson	Basel II - discussion of complex issues
	ECB	13.02.2015	Vitor Constâncio	Financial stability risks, monetary policy and the need for macro-prudential policy
	Fed	10.10.2012	Daniel K. Tarullo	Financial stability regulation
	Fed	20.09.2013	Daniel K. Tarullo	Macroprudential regulation
	Bank of England	12.10.2017	Andrew G. Haldane	Rethinking Financial Stability

Step 3: From this sample of speeches the 250 most frequent bigrams were extracted. From the resulting list, we manually removed misleading or ambiguous bigrams. The final dictionaries, displayed in Table A.6, contain 3 to 81 bigrams.

TABLE A.6: Dictionaries of main topics

House prices	Exchange rate	Climate change	Corporate debt
house price	exchange rate	climate change	corporate debt
real estate	current account	climate change	corporate bond
housing market	account deficit	run sustainable	issuance corporate
property price	foreign exchange	sustainable development	
housing finance	capital account	sustainable growth	
real house	real exchange	corporate sustainability	
housing market	account surplus	highest sustainable	
increase house	foreign currency	carbon economy	
home owner	us dollar	green finance	
housing supply	exchange market	environmental issue	
housing bubble	account balance	carbon emission	
home price	account convertibility	green bond	
home ownership	kong dollar	lower carbon	
demand housing	swap market	low carbon	
rise house	fx swap	environmental social	
ratio house	account surpluses	climate relate	
fall house	australian dollar	physical risk	
policy house	international currency	natural resource	
housing asset	terms trade	renewable energy	
residential investment	account balances	tragedy horizon	
equilibrium house	sterling	impact climate	
house purchase	net foreign	environmental protection	
house value	international financial	response climate	
property market	swiss franc	greenhouse gas	
housing sector	capital control	transition risk	
level house	nominal exchange	risk climate	
rate house	capital inflow		
property investment	foreign liability		
house value	export price		
development housing	global imbalance		
housing price	net export		
value house	non traded		
average house	international capital		
value property	external sector		
housing investment	currency board		
housing equity	foreign export		
residential construction	equilibrium exchange		
residential housing	foreign asset		
new building	fixed exchange		
affordable housing	trade weighted		
housing affordability	change exchange		
rising house	denominated foreign		
change house	exchange reserve		
	foreign asset		
	foreign claim		
	current account		
	foreign reserve		
	effect exchange		
	rate exchange		
	power parity		
	affect exchange		

B Online appendix: Robustness checks

This online appendix presents a variety of robustness checks for our empirical results. Specifically, we model the dependent variable (the number of relevant paragraphs) as count data and run alternative quasi-Poisson panel regressions (section B.1); repeat the OLS regression for alternative sample selections (section B.2) and with additional institutional control variables (notably central bank transparency and independence) (section B.3); and we test for lagged effects via an event study analysis (section B.4). The results from these robustness checks do not materially change our main results.

B.1 Poisson regression

We test whether results are robust to changes in the functional form of the regression model. Our dependent variable (i.e., the number of paragraphs) being count data, Poisson regressions are the relevant alternative for the regression model. Let Y_{it} indicate the number of topic-related paragraphs for central bank $i = \{1, \dots, 5\}$ in quarter $t = \{2000/1, \dots, 2019/4\}$. The indicator T_{it} equals 1 for central bank i conducting a QE program in quarter t . Let \mathbf{X}'_{it} represent the vector of control variables. Since our speech data enters as count data, we use a Poisson model with over-dispersion parameter ϕ , which can be written as $Y_{it} \sim \text{Poisson}(\lambda_{it}, \phi)$, with

$$\lambda_{it} = n_{it} \times \exp\{\gamma T_{it} + \mathbf{X}'_{it}\beta + \delta_i + \tau_t\}, \quad (2)$$

where γ represents the treatment coefficient and δ_i and τ_t are central bank and year-quarter fixed effects. The number of paragraphs n_{it} enters the equation as an offset and ϕ accounts for the fact that there is over-dispersion in the data (the variance is higher than the mean). By choosing a quasi-Poisson specification we assume the residuals to follow a Poisson-distribution, exempting the model from the assumption of homoscedasticity. In Table B.7, we present the coefficients of the QE variable with respect to speech behaviour.

The results are consistent with the results of the OLS model: With the exception of the exchange rate topic, coefficients are negative and significant for all topics of interest.

TABLE B.7: Quasi-Poisson regression with baseline results and control variables

	House prices		Exchange rate		Climate change		Corporate debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
QE	−0.302*** (0.082)	−0.245** (0.107)	−0.436*** (0.044)	−0.079 (0.056)	−0.284** (0.126)	−0.762*** (0.205)	−0.404*** (0.132)	−0.064 (0.160)
Inflation rate (%)		−0.039 (0.039)		−0.022 (0.016)		−0.009 (0.064)		−0.062 (0.053)
Interest rate (%)		−0.037 (0.027)		0.034*** (0.012)		−0.025 (0.049)		−0.081* (0.048)
GDP growth (log)		0.428 (0.714)		0.581*** (0.191)		−1.729** (0.700)		−0.698 (2.159)
Financial dev. index		−0.436 (1.052)		−0.570 (0.463)		−1.665 (1.728)		−5.948*** (2.071)
Property prices		0.210* (0.112)						
Nominal effective exchange rate				−0.353*** (0.121)				
Central Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1,408	1,076	1,408	1,095	1,408	1,095	1,408	1,095

Note: Standard errors are corrected for heteroscedasticity.

*p<0.1; **p<0.05; ***p<0.01

B.2 Sample selection

To check for robustness regarding sample selection, we run the baseline models on different subsets of central banks. First, we reduce the control group of to institutionally similar central banks, namely Norges Bank, the Reserve Bank of Australia, the Reserve Bank of New Zealand and the Bank of Canada (B.8). Second, we expand this group by including the Hong Kong M. A., for a sample representing all highly developed economies (B.9). Third, we only include the group of QE central banks (B.10).

TABLE B.8: Control group of similar central banks

	House prices		Exchange rate		Climate change		Corporate debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
QE	-0.458*** (0.107)	-0.431*** (0.156)	-0.545*** (0.062)	0.0002 (0.087)	-0.519*** (0.093)	-0.635*** (0.121)	-0.188** (0.093)	-0.152 (0.115)
Inflation rate (%)		-0.109** (0.053)		-0.067* (0.038)		0.054 (0.046)		0.006 (0.039)
Interest rate (%)		0.004 (0.031)		0.006 (0.027)		-0.021 (0.031)		-0.043* (0.025)
GDP growth (log)		2.911*** (1.123)		3.617*** (0.631)		1.282* (0.751)		-2.215*** (0.641)
Financial dev. index		1.121 (1.107)		0.475 (0.944)		-0.365 (0.981)		-2.442*** (0.737)
Property prices		0.110 (0.162)						
Nominal effective exchange rate				0.485* (0.282)				
Number of paragraphs	0.003*** (0.0002)	0.002*** (0.0002)	0.003*** (0.0002)	0.003*** (0.0002)	0.002*** (0.0001)	0.002*** (0.0002)	0.002*** (0.0002)	0.001*** (0.0002)
Central bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE		Yes		Yes		Yes		Yes
Observations	786	710	786	710	786	710	786	710
Adjusted R ²	0.357	0.487	0.579	0.660	0.430	0.435	0.188	0.246

Note:

*p<0.1; **p<0.05; ***p<0.01

TABLE B.9: Control group of rich countries

	House prices		Exchange rate		Climate change		Corporate debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
QE	−0.459*** (0.107)	−0.474*** (0.155)	−0.550*** (0.062)	−0.042 (0.088)	−0.520*** (0.093)	−0.659*** (0.120)	−0.188** (0.093)	−0.135 (0.112)
Inflation rate (%)		−0.118*** (0.045)		−0.023 (0.042)		0.029 (0.033)		0.006 (0.027)
Interest rate (%)		0.008 (0.028)		−0.005 (0.025)		−0.008 (0.028)		−0.032 (0.022)
GDP growth (log)		−0.663 (0.873)		2.132*** (0.594)		0.580 (0.562)		−1.807*** (0.438)
Financial dev. index		0.550 (1.120)		0.470 (0.928)		−0.464 (0.952)		−2.387*** (0.717)
Property prices		0.334** (0.132)						
Nominal effective exchange rate				0.830*** (0.281)				
Number of paragraphs	0.003*** (0.0002)	0.002*** (0.0002)	0.003*** (0.0002)	0.003*** (0.0002)	0.002*** (0.0001)	0.002*** (0.0002)	0.002*** (0.0002)	0.001*** (0.0002)
Central bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE		Yes		Yes		Yes		Yes
Observations	854	778	854	778	854	778	854	778
Adjusted R ²	0.430	0.529	0.590	0.657	0.445	0.447	0.249	0.304

Note:

*p<0.1; **p<0.05; ***p<0.01

TABLE B.10: QE group only

	House prices		Exchange rate		Climate change		Corporate debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
QE	-0.375*** (0.106)	-0.125 (0.164)	-0.479*** (0.057)	-0.140 (0.095)	-0.499*** (0.092)	-0.506*** (0.150)	-0.210** (0.094)	-0.259* (0.144)
Inflation rate (%)		-0.021 (0.072)		0.018 (0.040)		0.072 (0.064)		0.113** (0.056)
Interest rate (%)		-0.031 (0.046)		0.052 (0.034)		-0.015 (0.046)		-0.074 (0.046)
GDP growth (log)		-0.124 (2.253)		-0.973 (1.102)		-0.538 (1.414)		-2.354* (1.263)
Financial dev. index		3.513 (2.334)		-0.780 (1.526)		-1.078 (2.100)		-7.356*** (1.871)
Property prices		-0.388* (0.227)						
Nominal effective exchange rate				-0.483 (0.344)				
Number of paragraphs	0.002*** (0.0002)	0.002*** (0.0002)	0.002*** (0.0001)	0.002*** (0.0001)	0.002*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)
Central bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE		Yes		Yes		Yes		Yes
Observations	395	339	395	339	395	339	395	339
Adjusted R ²	0.353	0.504	0.633	0.725	0.458	0.483	0.178	0.216

Note:

*p<0.1; **p<0.05; ***p<0.01

B.3 Institutional control variables

The main institutional control variables for central banks are indices that measure their transparency ([Dincer and Eichengreen 2014](#)) and independence ([Romelli 2022](#)). Since these variables show virtually no variation during the sample period, they were not included in the main analyses. Including them does not change the main results.

TABLE B.11: Communication about house prices with institutional controls

	House prices		
	(1)	(2)	(3)
QE	−0.693*** (0.161)	−0.622*** (0.213)	−0.684*** (0.218)
Inflation rate (% change of cpi)	−0.012 (0.040)	−0.024 (0.034)	−0.009 (0.041)
GDP (log)	0.283 (0.747)	−0.591 (0.461)	−0.025 (0.877)
Interest rate (%)	0.002 (0.028)	0.037* (0.021)	0.030 (0.030)
Financial development index	−2.112** (0.960)	−0.268 (0.858)	−1.182 (1.082)
Property price index	0.030 (0.095)	0.129 (0.082)	0.041 (0.116)
CBI index	0.419 (1.033)		−0.045 (1.090)
Transparency Index		−0.026 (0.042)	−0.042 (0.048)
Number of paragraphs	0.002*** (0.0002)	0.002*** (0.0003)	0.002*** (0.0003)
Central bank FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	792	873	688
Adjusted R ²	0.614	0.628	0.621
<i>Note:</i> *p<0.1; **p<0.05; ***p<0.01			

TABLE B.12: Communication about the exchange rate with institutional controls

	Exchange rate		
	(1)	(2)	(3)
QE	−0.419*** (0.095)	−0.428*** (0.117)	−0.447*** (0.105)
Inflation rate (% change of cpi)	−0.060* (0.031)	−0.024 (0.032)	−0.078** (0.031)
GDP (log)	2.022*** (0.533)	0.880** (0.345)	2.911*** (0.526)
Interest rate (%)	0.017 (0.026)	0.042** (0.020)	0.012 (0.028)
Financial development index	−0.787 (0.852)	−0.117 (0.776)	−1.342 (1.007)
NEER index	−0.174 (0.216)	0.115 (0.239)	−0.058 (0.242)
CBI index	0.224 (0.813)		0.484 (0.811)
Transparency index		−0.102*** (0.031)	−0.049 (0.036)
Number of paragraphs	0.002*** (0.0002)	0.003*** (0.0002)	0.003*** (0.0002)
Central bank FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	792	892	688
Adjusted R ²	0.636	0.635	0.658

Note: *p<0.1; **p<0.05; ***p<0.01

TABLE B.13: Communication about climate change with institutional controls

	Climate change		
	(1)	(2)	(3)
QE	−0.593*** (0.147)	−0.762*** (0.116)	−0.572*** (0.158)
Inflation rate (% change of cpi)	−0.027 (0.028)	−0.019 (0.026)	−0.060 (0.037)
GDP (log)	−0.428 (0.321)	−0.323 (0.258)	0.389 (0.609)
Interest rate (%)	0.021 (0.017)	0.008 (0.017)	0.004 (0.026)
Financial development index	0.450 (0.750)	0.439 (0.646)	0.266 (0.899)
CBI index			0.672 (0.905)
Transparency index	0.005 (0.034)		0.025 (0.036)
Number of paragraphs	0.002*** (0.0002)	0.002*** (0.0001)	0.001*** (0.0002)
Central bank FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	892	1,095	688
Adjusted R ²	0.477	0.418	0.520
<i>Note:</i> *p<0.1; **p<0.05; ***p<0.01			

TABLE B.14: Communication about corporate debt with institutional controls

	Corporate debt		
	(1)	(2)	(3)
QE	0.157 (0.154)	-0.095 (0.108)	0.057 (0.163)
Inflation (% change of cpi)	-0.008 (0.023)	-0.006 (0.021)	0.011 (0.037)
GDP (log)	-0.467** (0.200)	-0.273 (0.168)	-1.437** (0.661)
Financial development index	-0.665 (0.564)	-0.463 (0.476)	-0.804 (0.728)
Interest rate (%)	-0.029** (0.013)	-0.025** (0.012)	-0.050** (0.022)
CBI Index			0.366 (0.648)
Transparency Index	0.021 (0.027)		0.039 (0.036)
Number of paragraphs	0.001*** (0.0001)	0.001*** (0.0001)	0.001*** (0.0002)
Central bank FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	892	1,095	688
Adjusted R ²	0.542	0.538	0.532
<i>Note:</i> *p<0.1; **p<0.05; ***p<0.01			

B.4 Lagged effects from QE on communication

The impact of QE is near-instant for some economic variables, but comes with lags for others. Whereas the announcement of a QE program tends to have an immediate effect on the exchange rate, the impact on asset prices—and thus on housing affordability—tends to increase over time. To test whether the cumulative effect on strategic silence increases with the accumulation of the economic effects of QE, we conduct an event study.

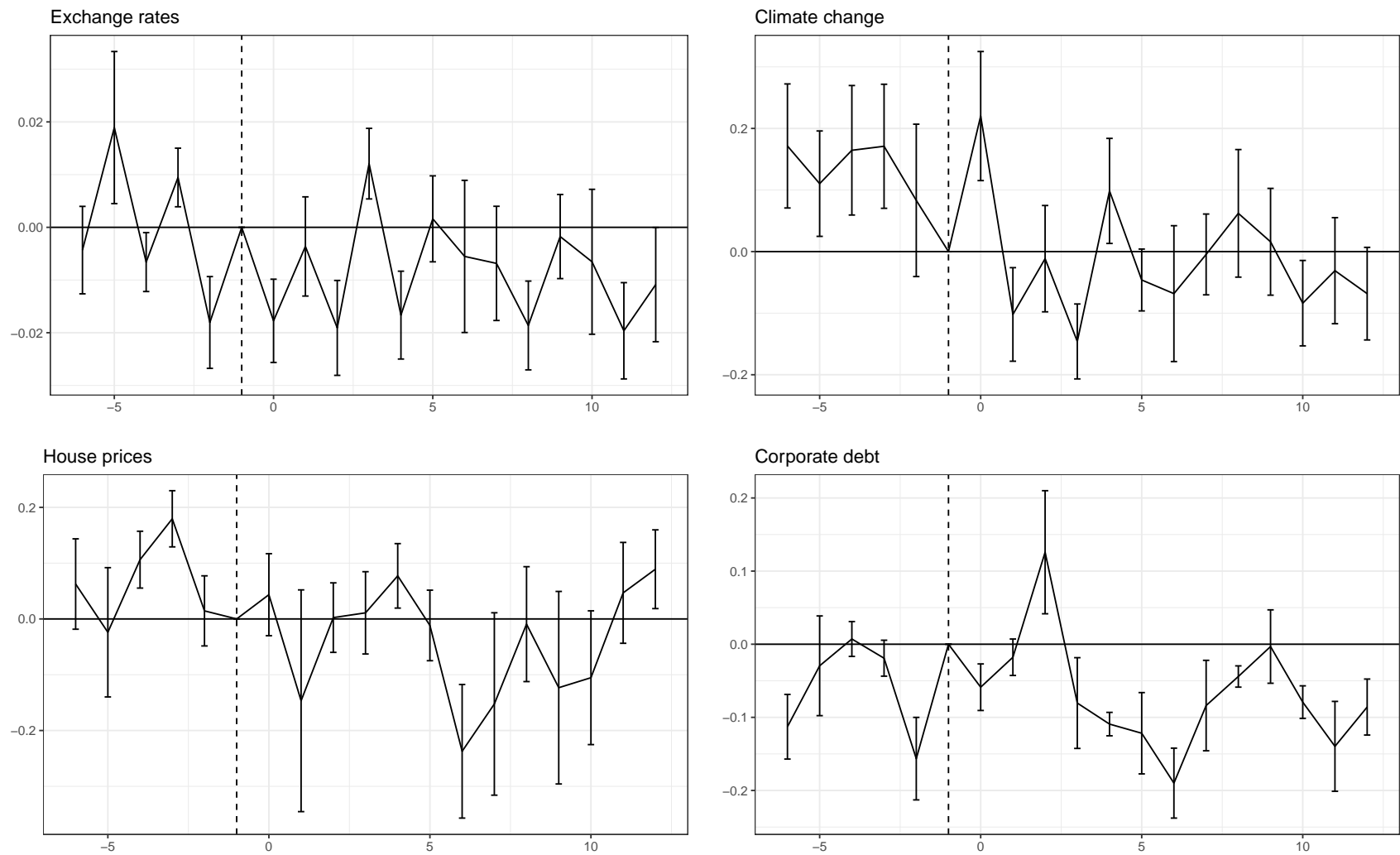
Event studies have been a popular tool for the analysis of financial market data. They aim to assess systematic changes in an outcome variable before and after a specific event of interest. The focus of these analyses therefore is not on calendar year-quarters t but on event year-quarters τ . The objective of our event study is to examine the evolution of topics.

We examine topic proportions before and after the start of a QE program. $\tau = 0$ is defined as the beginning of the quarter in which a QE program is launched. Taking into account that it takes time for public contestation to build, we look at a time window of six quarters before and after the introduction of QE ($\tau = -6, -5, \dots, 12$). Our event study models the expected level of proportions of a certain topic for central bank i in event year-quarter τ and corresponding calendar year-quarter t as

$$P_{it\tau} = \sum_{\tau=-5}^{12} \alpha_{\tau} * Z_{\tau} + \sum_{\tau=-5}^{12} \beta_{\tau} * Z_{\tau} \times QE_{it\tau} + \mathbf{X}'_{it}\delta \quad (3)$$

where Z_{τ} denotes event year dummies, which are equal to 1 for event year τ and 0 otherwise. The coefficients α_{τ} of these dummies vary over event years and thus capture systematic changes in topic proportions within the considered time frame. Given that our hypotheses imply different topic proportions for the QE group and the control group, the second term on the right hand side of equation B.2 introduces interactions between the event quarter dummies and the QE dummies with regression coefficients β . All time effects are estimated relative to a baseline event year. We choose six quarters before the start of QE ($\tau = -6$) as the reference point. The set of control variables \mathbf{X}'_{it} is the same as in the panel data regressions described above.

FIGURE 6: Point estimates for interaction effects of event quarters and QE central banks.



Note: Error bars indicate 90% confidence intervals.

Event study results are visualized in Figure 6, which shows topic proportions for our four topics. The smaller cross section for QE central banks means that confidence intervals are larger. Results for the house price topic provide support for the idea that strategic silence becomes more pronounced over time. The difference in communication intensity between QE and non-QE central banks begins to increase after one year of QE and turns statistically significant after six quarters. This pattern is consistent with the economic intuition that house prices—unlike exchange rates—adjust to the policy change more gradually, as demand from newly subsidized mortgage borrowers increases.

By contrast, for the exchange rate topic, the event study shows a strong effect for the quarter during which QE is launched. This is consistent with the intuition that foreign exchange markets are highly liquid and react almost instantly to changes in expectations of future developments. More broadly, the results for the exchange rate topic show a strong correlation between QE and non-QE central banks before the introduction of QE. This correlation breaks down after QE is introduced, when exchange-rate talk in the QE group becomes much more volatile. The private debt topic shows a lagged decrease after the start of QE. QE central banks gradually talk less about private debt issues than the control group, especially after 5 to 9 quarters after the start of QE. The climate change topic shows a strong decrease after the start of QE. After a particularly strong first-quarter effect, QE central banks consistently talk less about climate change than the control group.

To sum up, the event study adds texture to the panel regression results and provides further support for our hypotheses. It shows that strategic silence can be instant when the underlying variable—here: the exchange rate—adjusts instantly, whereas in the case of a gradually changing variable, public pressure and strategic silence build cumulatively over time.

B.5 Table 4 with all covariates

TABLE B.15: Central bank-specific determinants of communication on contentious topics

	House prices		Exchange rate		Climate change		Corporate debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
QE	-0.107 (0.126)	0.081 (0.194)	-0.562*** (0.115)	-0.440*** (0.119)	-0.191 (0.139)	-0.594*** (0.136)	0.059 (0.120)	0.059 (0.134)
Fed-BoE- Riks	0.259** (0.122)	2.024* (1.180)						
ECB-BoJ			0.517*** (0.091)	5.066*** (1.460)	0.667*** (0.112)	-1.060 (1.247)	-1.446*** (0.104)	-1.446* (0.832)
QE x Fed- BoE-Riks	-0.506 (0.218)	-0.944*** (0.243)						
QE x ECB-BoJ			0.094 (0.134)	0.439*** (0.158)	-0.571*** (0.193)	-0.456** (0.226)	-0.417** (0.179)	-0.417** (0.206)
GDP growth (log)		0.550 (0.381)		0.939*** (0.300)		-0.395 (0.257)	-0.339 (0.257)	-0.339** (0.167)
Inflation rate		-0.059* (0.033)		-0.022 (0.031)		-0.016 (0.027)	-0.003 (0.027)	-0.003 (0.021)
Interest rate		-0.009 (0.021)		0.034* (0.019)		0.011 (0.017)	-0.023 (0.017)	-0.023* (0.012)
Fin. dev. index		-1.249* (0.726)		0.374 (0.612)		0.543 (0.643)	-0.367 (0.643)	-0.367 (0.471)
Property prices		0.082 (0.066)						
Nominal effective exchange rate				0.038 (0.199)				
Number of paragraphs	0.002*** (0.0002)	0.002*** (0.0002)	0.002*** (0.0002)	0.003*** (0.0002)	0.001*** (0.0002)	0.002*** (0.0001)	0.001*** (0.0001)	0.001*** (0.0001)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1,408	1,076	1,408	1,095	1,408	1,095	1,095	1,095
Adjusted R ²	0.554	0.613	0.565	0.638	0.361	0.421	0.540	0.540

Note:

*p<0.1; **p<0.05; ***p<0.01