

Noisy politics, quiet technocrats? Central banking in contentious times

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Abstract

In a break from the quiet politics of the pre-2008 period, when delegation arrangements were remarkably stable, many policy areas have become increasingly ‘noisy’. How do independent agencies designed for quiet politics react when a contentious public turns the volume up on them? We theorize that depending on the levels of epistemic uncertainty and political salience, agencies choose between different modes of engagement: Whereas strategic ignorance, organized hypocrisy, and strategic silence are aimed at quelling ‘noise’ and sustaining depoliticization, head-on engagement means to enter the political fray to engage critics directly and openly. Focusing on the case of unconventional monetary policy in the aftermath of the global financial crisis, we hypothesize that the high-salience and high-uncertainty conditions under which central banks implemented quantitative easing programs made them prone to seeking to dodge public contention via strategic silence. To test this hypothesis, we study central bank communication on sensitive topics related to quantitative easing. Using panel regression analysis on a dataset of more than 11,000 central bank speeches, we find that central banks conducting QE programs exhibited strategic silence on house prices, private debt, and climate change. Their strategic silence varies in line with countries’ growth models and the parameters of QE programs. These findings point to significant technocratic agency in the de- and re-politicization of policy issues.

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1 Introduction

Delegated authority, designed to shield economic policy-making from political contention, has itself become contentious. 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 “contentious” (Bojar et al. 2021), “politicized” (de Wilde and Lord 2016) and “noisy” (Morgan and Ibsen 2021). This has been true not only for elected governments but also for technocratic bodies.

How do independent agencies designed for quiet politics react when the volume is turned up on them? Building on organizational sociology (Carpenter 2010) and public administration research (Gilad, Maor, and Bloom 2015), recent work in political science has shown technocratic bodies to be responsive to public contention (Rauh 2016; van der Veer 2020). In being responsive, they 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). Engagement is often straightforward to observe, and has been documented in a number of recent studies of technocratic responsiveness (Koop and Lodge 2020; Moschella, Pinto, and Martocchia Diodati 2020). However, to engage means to acknowledge contention and to validate critics, which carries risks for independent agencies. Often, therefore, the default reaction of technocratic bodies is to preempt, evade, or counter politicization.

We propose a typology of four ‘modes of (dis-)engagement’ by technocratic agencies, organized around two variables, epistemic uncertainty and salience (see table 1). When uncertainty is low and salience is high, agencies tend to be forced into *head-on engagement*, which *may* bolster depoliticization but is more likely to politicize the agency’s role. The other three scenarios describe modes of disengagement: *strategic ignorance* when epistemic uncertainty is high and salience are low (McGoey 2012); and *organized hypocrisy* when epistemic uncertainty is high but salience low (Weaver 2008). When both uncertainty and salience are high, ‘sitting it out’ is a tempting option. Drawing on research by Maor, Gilad, and Bloom (2013) and Rimkutė (2020), we call this mode of engagement, which

aims at depoliticization, *strategic silence*.

Of the three modes of engagement aimed at depoliticization, strategic silence is the most difficult to observe and measure. Focusing on the case of central banking, this paper develops and implements a research design to overcome these difficulties. Arguably, no other institution wields more power at such a high degree of *de-jure* independence. The remarkable stability of this delegation arrangement was tested by the global financial crisis of 2008, when central banks deployed unconventional policy instruments far exceeding pre-crisis policies in scale, scope, and distributive consequences. The backlash against these interventions, which came from both civil society and from political parties, brought a level of contention that monetary policymakers had not experienced since the stagflation period of the 1970s (Macchiarelli et al. 2020; Moschella 2024).

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 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). QE was a highly experimental policy intervention that “was not anchored in consensual ideas” (Mandelkern 2016, 227) and during which central banks essentially flew blind (Best 2022; Cassar 2023). In other words, QE was implemented under significant epistemic uncertainty. At the same time, QE was met with considerable opposition and salience was, by the standards of monetary policy, very high. Forms of contention ranged from political attacks to social movements and even street-level protests (Weber 2018; della Porta 2020). We therefore theorize that central banks’ preferred mode of engagement was strategic silence. Specifically, we expect that an active QE program makes a central bank *less* likely to speak about contested, QE-related topics. Moreover, we expect the strength of this effect to vary depending on countries’ growth models and on the precise composition of asset purchases. In the US and UK, where growth is consumption-led and asset purchases geared towards mortgage-backed securities, we expect strategic silence primarily on house prices; in Europe and Japan,

where growth is export-led and asset purchases include corporate securities, we expect central banks to speak less about exchange rates, private-sector debt, and climate change.

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. Once the emergency phase of the financial crisis of 2008-09 had passed, five central banks—the Federal Reserve, Bank of England, Bank of Japan, European Central Bank, and Sveriges Riksbank—conducted QE programs and were confronted with contestation regarding the effects of QE on house prices, exchange rates, private-sector debt, and climate change. Our panel regressions show a significant negative effect for active QE programs on the quantity of central bank communication on these topics. We also find evidence in support of three out of four growth-model and QE-design specific hypotheses. In the US and UK, where growth is consumption-led and asset purchases geared towards mortgage-backed securities, strategic silence is particularly pronounced for house prices; in the euro area and Japan, where growth is export-led and asset purchases include corporate securities, strategic silence is more pronounced for private-sector debt and climate change. For exchange rates, the strategic silence effect is not statistically significant. 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 theorizes strategic silence as one of four modes of (dis-)engagement. 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 Post-delegation politics: Modes of engagement

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.”¹

Principal-agent theory—long the dominant approach to studying those dynamics—has focused on the preferences and credibility of the delegating principal, and of the agent’s desire for autonomy (McCubbins 1985). In recent years, however, students of delegation have increasingly devoted their attention to social and political dynamics that exceed the scope of principal-agent theory. Building on the sociological literature on bureaucratic reputation (Carpenter 2010; Hood 2010; Carpenter and Krause 2012), they have studied how technocratic agencies, as actors in their own right, manage their reputation vis-à-vis multiple audiences (Busuioc and Lodge 2016, 2017). 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 (Koop and Lodge 2020) and at the supranational level (De Wilde 2011; Busuioc and Jevnaker 2020; Koop, Reh, and Bressanelli 2022).

¹This 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).

TABLE 1: Four modes of engagement

		Salience	
		Low	High
Epistemic uncertainty	High	Strategic ignorance	Strategic silence
	Low	Organized hypocrisy	Head-on engagement

Depoliticization strategies can be “assertive” or “restrained”, depending on the perceived nature of the threat from contention (Bressanelli, Koop, and Reh 2020, 335). Thus, delegation does not insulate independent agencies from post-delegation contention. Indeed, as persuasively argued by Onoda (2024, 1352), 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.

How agencies react to such contention remains an open empirical question. We expect that independent agencies such as central banks will opt for genuine engagement only as a last resort. To develop this theoretical argument, we present a typology of four modes of engagement in the face of contention. Table 1 shows a 2-by-2 matrix whose axes display two dimensions of variation between episodes of contention show variation: the degree of *epistemic uncertainty* and the political *salience* surrounding the contentious issue. Regarding the former, contention is easier to ignore or silence when when epistemic uncertainty is high. This is usually the case when a policy is new and not yet supported by an established body of research—a situation in which central bankers have often found themselves (Best 2022). This is bound to change over time, as evidence about the (side) effects of the new policy accumulates. The second dimension—salience—has long been identified as a crucial political variable. Much of what defines politics under “noisy” conditions, such as media attention and electoral competition, falls away under conditions of “quiet politics”, empowering highly organized and motivated actors, such as business groups (Culpepper 2010). Note that all but the bottom-right cell represent engagement-avoidance strategies. As a general rule, independent agencies strive to be in the upper-left cell, where low salience and a high degree of epistemic uncertainty provide cover.

In the 2-by-2 matrix displayed in table 1, the scenario of the upper-left cell is where an agency is likely to opt for “strategic ignorance”—choosing not to know what could, with reasonable effort, be known (McGoey 2012). In central banking, strategic ignorance used to be part and parcel of inflation targeting—a governance paradigm under which central banks steer market expectations by focusing their forecasts exclusively on price stability. (Best 2020). The narrow field of vision that comes with “seeing like the Fed” is a feature, not a bug: When a housing bubble formed in the US, the Fed opted to ignore it and let it run its course (Fligstein, Stuart Brundage, and Schultz 2017).

Where agencies cannot hide behind uncertainty but still seek to avoid head-on engagement, they need to resort to more aggressive engagement-avoidance strategies. This is the realm of “organized hypocrisy”—the practice of systematically saying one thing while doing another (Brunsson 2003). The best-known example is Weaver (2008), who has shown persistent divergence between rhetoric and practice at the World Bank. Albeit without using the concept, scholars of central banking have documented organized hypocrisy by central banks when it comes to the “taboo” of monetary financing of public debt (Diessner 2023; Bateman and van ‘t Klooster 2024).

When salience is high, reducing ‘noisiness’ becomes the first priority—hence “strategic silence” in the upper-right cell. Strategic silence has been demonstrated for policy areas in which independent agencies enjoy a strong reputation and hence do not feel the need to respond to public pressure (Maor, Gilad, and Bloom 2013; Rimkutė 2020). As central banks moved into uncharted territory, the exceptionally high level of epistemic uncertainty made quantitative easing a prime candidate for strategic silence (Best 2022; Cassar 2023).

Only when public contention around high-salience issues persists are independent agencies to shift to head-on engagement with their critics. They tend to stave off engagement for as long as possible because it threatens their epistemic authority and validates contention on the issue in question. What is more, head-on engagement risks creating new forms of de-facto accountability, be it for additional substantive policy issues or towards additional audiences, or both (Dawson and Maricut-Akbik 2021). The case of quantitative easing illustrates this dynamic.

3 Contentious QE and strategic silence

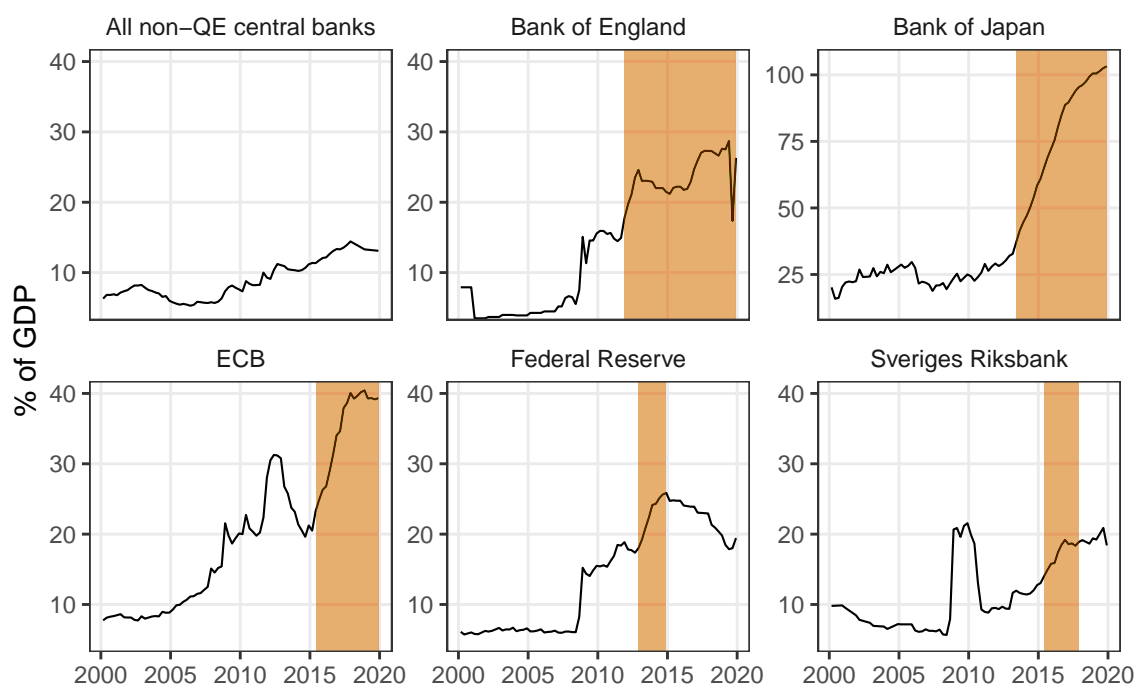
The global diffusion of central bank independence constituted a particularly consequential case of depoliticization via delegation (Polillo and Guillén 2005). Much of this diffusion occurred under the benign macroeconomic conditions of the ‘Great Moderation’—a period of exceptionally ‘quiet’ monetary politics. The global financial crisis of 2008 marked a turning point by greatly increasing the salience of economic policy in general, and of central banking in particular (Moschella 2024). In an environment of “noisy politics” (Morgan and Ibsen 2021), it became much more difficult to contain post-delegation 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 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.²

Although QE-conducting central banks did not see their formal independence rescinded, they did encounter unprecedented public contention over the legitimacy of their actions (Moschella 2024). 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

²The Swiss National Bank, whose asset purchases were geared exclusively towards foreign assets, is not classified as a QE central bank.

FIGURE 1: Central bank assets as a percentage of GDP

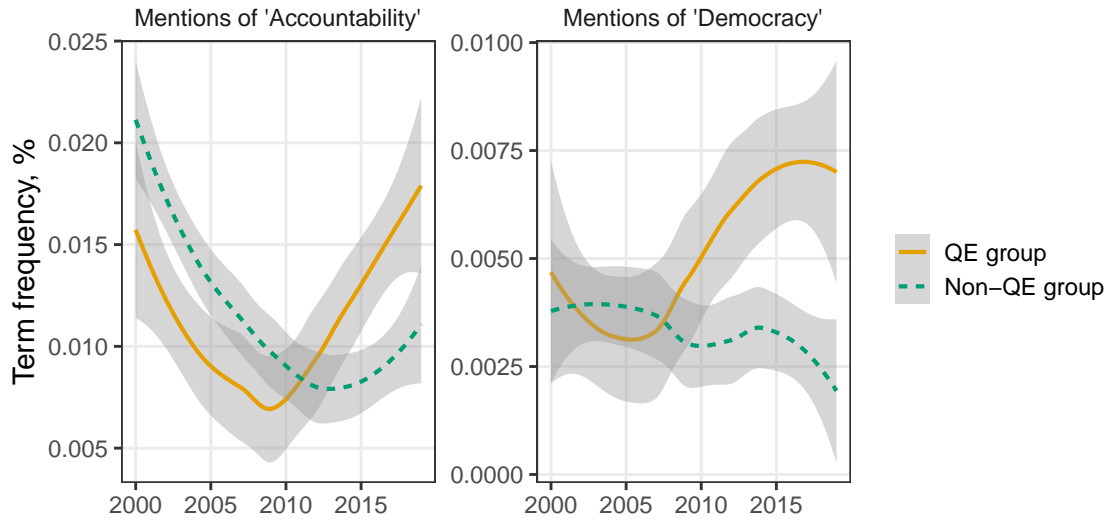


Note: Shaded areas indicate post-2009 QE programs. The first plot shows the unweighted average of 13 non-QE central banks. Where only annual data was available, missing values have been filled in via linear interpolation.

right as well as on the left embraced anti-central bank rhetoric (Jones 2019).

How did central banks respond to this dramatically increased level of public contention? A simple way to gauge their heightened concern for their legitimacy is to track the frequency with which they spoke about “accountability” and “democracy”. As shown in Figure 2, Panel B, became more prominent among central banks conducting QE programs. This concern does not imply, however, that central banks opted for head-on engagement with their critics. To motivate our strategic silence hypothesis, consider two further empirical observations about central bank communication during the QE period. The first is anecdotal, and stems from the recently released transcript of an 2017 meeting of the Fed’s Federal Open Markets Committee (FOMC). Policymakers discussed whether the word “wealth” should be used in a sentence that cites increasing household wealth—as a result of rising asset prices—to lend credence to the FOMC’s positive outlook for aggregate demand. The president of the Minneapolis Fed, who raised the concern, expressed unease over using a word that appeared to imply that the Fed monitored, or perhaps

FIGURE 2: QE central banks talked more about ‘accountability’ and ‘democracy’ during the QE period



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

even influenced fluctuations in the level—let alone the distribution—of household wealth. To bolster his case, he pointed out that “2011 was the last time the word ‘wealth’ was included in a statement” (FOMC 2017). In effect, he documented a pattern of strategic silence, and argued that it should be maintained. A second empirical observation pointing to strategic silence as the preferred mode of engagement of QE-conducting central banks stems from Fabo et al. (2021). Their meta-analysis of the literature on the effects of quantitative easing shows 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.

As indicated above, silence is an unstable strategy. Where salience remains high and public contention persists, technocratic agencies will likely to be forced into engaging their critics head-on. Recent changes in both the form and the substance of central bank communication provide support for this theory. Regarding form, “rethinking how and with whom central banks engage” became a common theme among central bank officials, who sought a “much wider and deeper engagement with society” marked a radical departure from the period when central banks sought to speak only to “MEN”, or ‘Mar-

kets, Economists, and News’ organizations (Haldane 2017, 2, 9). Several central banks launched educational campaigns to explain the workings of the monetary system to the broader public, and established new formats for two-way communication with citizens and civil society actors such as “Fed Listens”, “ECB Listens”, or the Bank of England’s “Citizen Panels” (Braun 2016; Riles 2018). Regarding substance, too, central banks have clearly shifted towards head-on engagement on a number of contentious, QE-related 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). It is also true for asset price inflation and private debt—topics that central bankers have debated much more openly in recent years. In 2020, the president of the Fed acknowledged that “the volume of debt [is] high” and that it has been “concentrated in the riskier forms of debt” (Powell 2019). However, these engagement efforts came late, often coinciding with central banks beginning to shrink their asset portfolios. The following two sections therefore present a research design and method to test the hypothesis that prior to embracing head-on engagement, central banks engaged in rearguard action in the form of strategic silence.

4 Research design and hypotheses

Our focus is on specific, particularly contentious side effects of QE. We distinguish between first-order and second-order effects. As explained in this section, the former are clearly identifiable as asset-price inflation and exchange-rate depreciation; for the latter we focus on the most contested ones, namely the ramifications for private-sector debt and for emission-intensive sectors (and thus for climate change). We expect QE central banks as a group to talk less about all four of these topics.

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

First-order effects: Asset-prices and exchange-rate

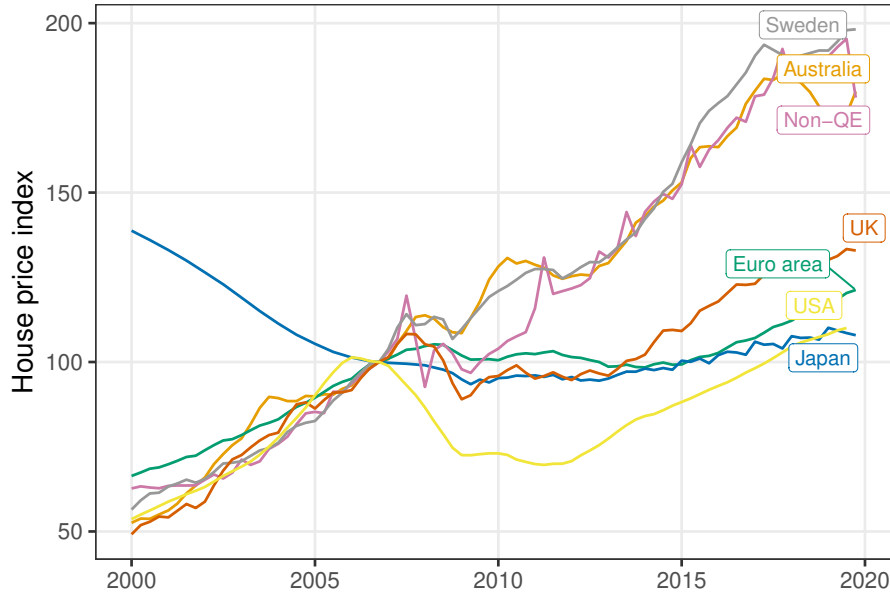
Asset price inflation and exchange rate depreciation are at the core of the transmission channels of QE. Which of these first-order effects prevails depends on the structure of the economy—specifically, whether a country’s growth model is consumption-led or export-led (Baccaro and Pontusson 2016).³ Whereas the Fed and the Bank of England sought to stimulate domestic demand by targeting asset prices (and thus household wealth), the ECB and the Bank of Japan sought to stimulate demand from exports (while “importing” inflation) by targeting the exchange rate (Reisenbichler 2020; Van Doorslaer and Vermeiren 2021). The ECB limited its purchases to sovereign and corporate bonds, whereas the Bank of Japan pioneered the large-scale purchase of corporate equities (via exchange-traded funds) and real estate investment trust shares (Dell’Ariccia, Rabanal, and Sandri 2018). Thus, depending on the structure of their economies and the parameters of their QE programs, central banks confronted different legitimacy challenges.

Monetary policy always has distributional effects, but they become particularly pronounced with QE (IEO 2019; Fontan, Claveau, and Dietsch 2016). That is because QE inflates asset values, and thus household wealth, 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.

House prices were at the center of the politics of QE (Reisenbichler 2020). Figure 3 shows the development of residential nominal house prices for the 18 monetary areas in our panel. With the exceptions of Japan and the euro area, house prices increased everywhere during the QE period, and well beyond 2007 levels. However, the Fed and the Bank of England were the only central banks whose QE programs specifically targeted the housing market (Di Maggio, Kermani, and Palmer 2020). To them, rising house prices were a sign of success. By contrast, house prices were not the primary target variable

³For a historical argument that monetary policymakers do what they can to support their countries’ growth models, see Wansleben (2023).

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



Data: Bank for International Settlements.

for the QE programs of the ECB and the Bank of Japan. For the ECB in particular, grievances over house price inflation in countries such as Germany became a major issue (Baldenius, Kohl, and Schularick 2020).

Hypothesis 2: *Strategic silence on house prices is more pronounced for the US and the UK, where house prices are more politically salient and whose central banks' QE programs specifically targeted house prices.*

The other first-order effect of QE is exchange-rate depreciation. Other things equal, lower bond yields weaken foreign demand for domestic financial assets, putting pressure on the exchange rate. 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, whose QE programs specifically targeted exchange rate devaluation.*

Second-order effects: private debt and climate change

We focus on what emerged as the most contested policy issues during the QE years. 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 the crisis (Walter and Wansleben 2020, 625). It is not surprising, therefore, that the link between QE and newly rising 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 the potential negative consequences of QE for debt levels and financial stability (BIS 2015; Hong, Igan, and Lee 2022).

Hypothesis 4: *Central banks with active QE programs display strategic silence on the topic of private-sector debt.*

Hypothesis 5: *Central banks with active corporate bond buying programs display strategic silence particularly on the topic of corporate debt.*

Climate change 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 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. Here, too, the parameters of QE programs mattered—only the ECB and the Bank of Japan’s programs included *corporate* bonds and equities. Resisting considerable civil society pressure, these central banks insisted on the need for their interventions to remain “market neutral” (van ’t Klooster and Fontan 2019).

Hypothesis 6: *Central banks whose QE programs target corporate securities without regard to climate issues display strategic silence on the topic of climate change.*

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).

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

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.⁴ 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).

Speeches were preprocessed by removing all non-words (URLs and numbers) and by lemmatizing.⁵ 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). Very short paragraphs (four words or fewer), reference lists, stop words, and terms occurring fewer than ten times were excluded. Table 2 summarizes this preprocessing chain.

To trace our topics—which are too small and specific for vector space models or topic models—we used a dictionary-based approach. 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

⁴The 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.

⁵We used *SpaCy* and *quanteda* (Benoit et al. 2018).

this sample we extracted, in a second step, the 250 most frequent bigrams.⁶ 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 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. The duration of those QE programs is indicated by shaded areas in Figure 1 above; their key characteristics are summarized in Table 3.

⁶Bigrams capture multi-word expressions such as “interest rate” or “asset price” and perform better than unigrams in leading to the intended context.

TABLE 3: Key features of quantitative easing programs

	QE periods	Types of securities	Sensitive topics
Bank of England	2011Q4-2019Q4	Government bonds, corporate bonds	House prices, household debt
Federal Reserve	2012Q4-2014Q4	Government bonds, mortgage-backed securities	House prices, household debt
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
ECB	2015Q1-2018Q4, 2019Q4	Government bonds, asset-backed securities, corporate bonds	Exchange rates, corporate debt, climate change

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 = 100.⁷ 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

⁷To obtain legible coefficients, we reduce the magnitude of indexed variables by a factor of 100.

(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.

6 Results

Results are shown in Table 4. 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 private debt 18.5% ($e^{-0.204} = 0.815$).

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, additional institutional control variables (notably central bank transparency and independence), 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 (see B.1). We also perform an event study analysis, which shows that strategic silence is front-loaded for the exchange rate—which indeed tends to adjust instantly to QE announcements—but cumulative for house prices—which indeed increase steadily as more buyers enter the market (see B.4).

So far, we have only tested the general hypothesis of a negative relationship between

TABLE 4: Determinants of central bank communication on contentious topics (OLS)

	House prices		Exchange rate		Climate change		Private 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)	-0.204** (0.102)	-0.469*** (0.128)
Inflation rate (% change of CPI)		-0.034 (0.034)		-0.010 (0.031)		-0.018 (0.027)		-0.046 (0.028)
Interest rate (%)		-0.004 (0.022)		0.033* (0.020)		0.006 (0.018)		-0.015 (0.017)
GDP growth rate (log)		0.199 (0.367)		0.821*** (0.298)		-0.359 (0.258)		-0.166 (0.232)
Financial dev. index		-0.523 (0.760)		0.729 (0.644)		0.756 (0.674)		2.377*** (0.663)
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*** (0.0002)
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

active QE programs and central bank communication about sensitive topics. To test the more specific hypotheses 2-5, we run two sets of models that interact the QE dummy with different central bank pairs. Interacting the QE dummy with the Fed and the Bank of England, we test whether the house-price effect is driven by countries with consumption-led growth models, in which QE programs operate primarily through the housing market (hypotheses 2 and 4). Interacting the QE dummy with the ECB and a Bank of Japan, we test whether the exchange-rate effect is driven by countries with export-led growth models (hypothesis 3, and whether the climate-change effect is driven by central banks whose asset purchases include corporate bonds and equities, and thus the securities of carbon-intensive companies (hypothesis 5). For the purpose of the latter test, we disaggregate the private-sector debt topic into its two components, corporate debt and household debt. Table 5 summarizes the results.

TABLE 5: Central bank-specific determinants of communication on contentious topics

	House prices		Exchange rate		Climate change		Corporate debt		Household debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
QE	-0.206 (0.132)	-0.131 (0.193)	-0.558*** (0.114)	-0.414*** (0.119)	-0.181 (0.139)	-0.566*** (0.136)	0.154 (0.121)	0.053 (0.133)	-0.158 (0.111)	-0.306* (0.170)
Fed-BoE	0.291** (0.141)	1.598 (1.168)							0.144 (0.133)	0.841 (0.696)
ECB-BoJ			0.511*** (0.100)	4.893*** (1.475)	0.678*** (0.122)	-1.152 (1.249)	0.438*** (0.116)	-1.248 (0.829)		
QE x Fed-BoE	-0.394 (0.237)	-0.826*** (0.259)							-0.091 (0.211)	-0.328 (0.248)
QE x ECB-BoJ			0.090 (0.134)	0.423*** (0.158)	-0.581*** (0.194)	-0.470** (0.228)	-0.643*** (0.180)	-0.424** (0.204)		
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1,326	998	1,326	1,017	1,326	1,017	1,326	1,017	1,326	1,017
Adjusted R ²	0.556	0.612	0.569	0.643	0.363	0.419	0.568	0.565	0.306	0.324

Note: Standard errors are corrected for heteroscedasticity.

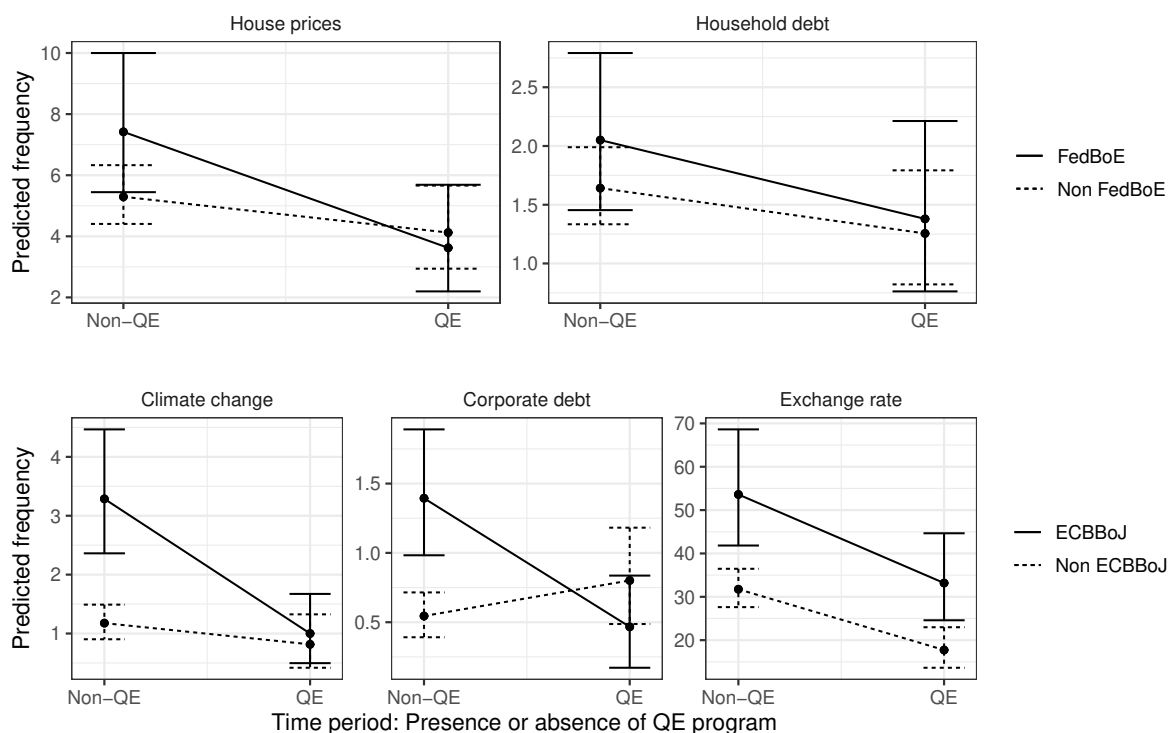
*p<0.1; **p<0.05; ***p<0.01

Note: All models with central bank fixed effects. Controls as in Table 4. Results with all covariates in Table B.5.

Results from the interaction model reinforce the results of the simple OLS regression. Once controls are included, the interaction term for the Federal Reserve and the Bank of England shows a strongly significant negative effect of QE on communication about house prices 56.2% ($e^{-0.826} = 0.438$), providing support for hypothesis 2). The coefficients for household debt are negative but small and not significant, and thus do not support hypothesis 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%, $e^{-0.424} = 0.654$) and, providing support with hypotheses 5 and 6. By contrast, although the QE programs of the ECB and the Bank of Japan have been 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—Janet Yellen’s Federal Reserve may 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. The y-axis shows the predicted frequency of central bank talk about house prices, household debt, etc. This frequency is predicted for non-QE times versus QE times, displayed on the x-axis. The solid lines represent predicted frequencies for topic-specific combinations of QE-central banks, the dotted lines for their non-QE peers. The two panels in the top row show that whereas the Fed and the Bank of England communicate *more frequently* than their peers about house prices and household debt during non-QE times, they mentioned these topics *less* frequently while conducting QE programs. The plot showing results from the baseline model 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, the ECB and the Bank of Japan reduced their communication about climate change and corporate debt while conducting asset purchases.

FIGURE 4: Marginal effects of interactions



7 Testing for alternative explanations

To further validate our results, 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 a concern for stock price inflation, which does not create clearly identifiable losers.⁸ The results presented in Table 6 support this intuition—with control variables included, active QE programs do not have a significant effect on the quantity of central bank communication on share prices.

⁸The delicacy of this distinction for central bankers is illustrated by Ben Bernanke’s waivering 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 is a given that QE pushes up the valuation of both types of assets, stocks and houses.

Another alternative explanation 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 to asset prices, including house prices—emerged as a new master framework for systemic financial regulation (Thiemann 2023). Indeed, the regression results 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.

TABLE 6: The effect of QE on central bank communication on two additional topics

	Share prices		Macroprudential	
	(1)	(2)	(3)	(4)
QE	-0.149*	0.050	0.782***	0.388***
	(0.086)	(0.111)	(0.108)	(0.119)
Inflation rate		0.001		-0.039
		(0.028)		(0.032)
Interest rate		-0.016		-0.003
		(0.017)		(0.020)
GDP growth (log)		0.549**		0.438
		(0.223)		(0.267)
Financial development		0.061		-0.154
		(0.665)		(0.704)
Number of paragraphs	0.002***	0.002***	0.002***	0.002***
	(0.0002)	(0.0002)	(0.0002)	(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

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

8 Conclusion

Central banks conducting QE programs faced intense *public* contention. That does not imply, however, that central banks respond via direct engagement. We theorize that when confronted with contention on an issue that is highly salient and associated with substantial epistemic uncertainty, strategic silence will be central banks' preferred mode of engagement. Testing several variants of this 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.

Interacting the QE dummy with individual central banks shows that effect strength varies as expected—strategic silence on house prices is driven by central banks in countries with consumption-led growth models (Fed and Bank of England), whereas strategic silence on corporate debt and climate change is driven by central banks with QE programs 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.” These results are robust to changes in sample selection and to different text mining methods.

Throughout the 2010s, central banks expected a gradual exit from unconventional monetary policy measures, followed by a return to the status quo ante. These expectations were shattered by the monetary policy response to the Covid-19 pandemic, when quantitative easing returned at an even larger and more global scale, with at least twelve developing and emerging market economies launching their own QE programs ([Smith 2020](#)). Our findings regarding noise-reduction via strategic silence casts these developments in a new light. Under continued advocacy and campaigning by civil society actors who engaged central banks on the distributional impact and the carbon footprint of their asset purchases, strategic silence on these topics was not a sustainable mode of engagement. This is particularly evident in the case of climate change, which central banks have,

by now, acknowledged as a core challenge for monetary policy and financial regulation (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). Where salience is high and where central banks cannot hide behind epistemic uncertainty, strategic silence is bound to give way to head-on engagement—even on topics at the core of technocratic delegation arrangements.

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A Appendix

A.1 Central bank speech dataset

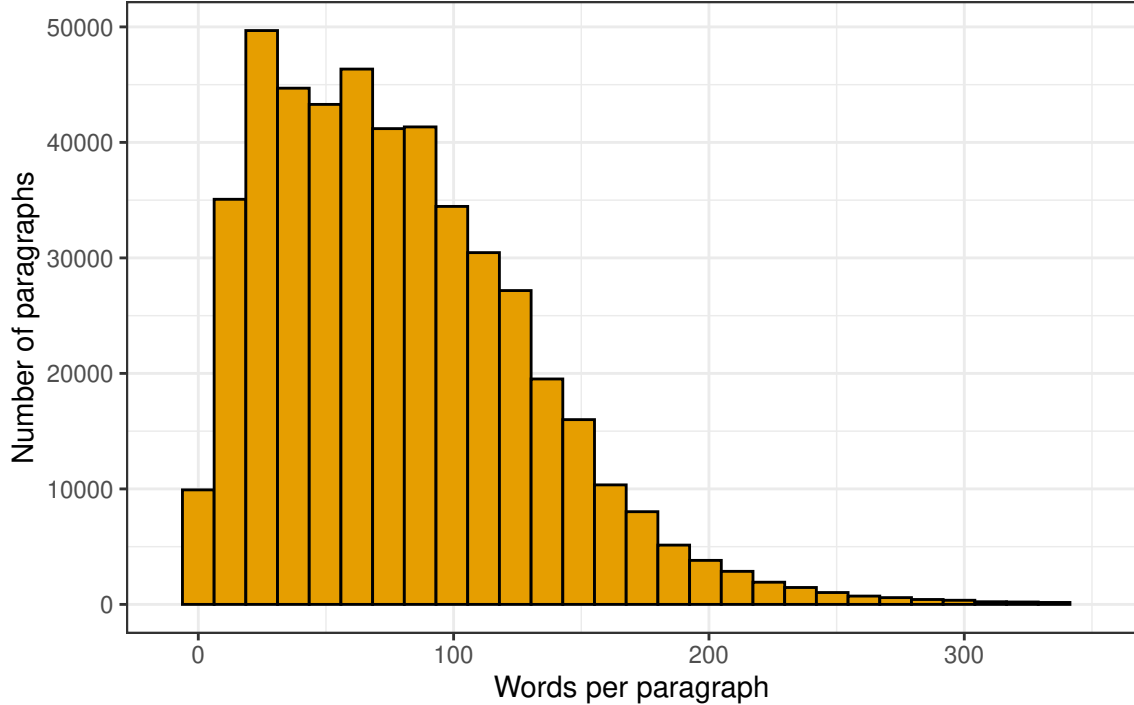
Table A.1 provides a breakdown of the content of the speech dataset. We have sourced 11,243 speeches from 18 central banks, covering the period from 2000 to 2019. For all but the Central Bank of Malaysia, we have sourced speeches directly from the respective central banks’ websites (Source: ‘Local’). 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
Monetary 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
Central Bank of Malaysia	477	1	6	17	BIS	477
Central Bank 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	Private debt	Share prices	Macroprudential
property price	exchange rate	carbon	private debt	stocks	macroprudential
house price	devaluation	environment	private sector debt	stock market	prudential
land price	devalueate	environmental	household debt	stock price	regulation
home price	appreciation	sustainability	mortgage debt	stock valuation	debt
real estate	currency	sustainable	consumer debt	stock value	systemic risk
rent price	export price	climate change	individual debt	equity	financial cycle
residential	competitiveness	climate neutral	private indebtedness	equities	procyclical
		climate risk	household indebtedness	bull market	countercyclical
		impact climate	household leverage	dividend	credit cycle
		stranded asset	corporate debt	buyback	leaning against
		greenhouse	company debt		basel
		fossil	corporate indebtedness		buffers
			corporate leverage		capital requirement
			firm leverage		regulatory capital
					loan value

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 Samvridhhi 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	
	Exchange rate	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
		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	
Reserve Bank 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	Bandit 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	
	Private debt	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
		Fed	26.02.2004	Susan S. Bies	The Economic Outlook and the State of Household and Business Finances
Fed		18.01.2005	Susan S. Bies	The Economy and Challenges in Retirement Savings	
Fed		23.10.2004	Susan S. Bies	The Federal Reserve System and the Economy	
R. B. of New Zealand		10.09.2018	Michele Bullock	The Evolution of Household Sector Risks	
Sveriges Riksbank		08.05.2014	Cecilia Skingsley	Household debt under the microscope	
Bank of Canada		24.02.2016	Lawrence Schembri	Connecting the dots - elevated household debt and the risk to financial stability	
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		24.09.2009	Spencer Dale	Separating Fact from Fiction: Household Balance Sheets	
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
	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
Macroprudential	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 28 to 81 bigrams.

TABLE A.6: Dictionaries of main topics

House prices	Exchange rate	Climate change	Private debt
house price	exchange rate	climate change	household debt
real estate	current account	climate change	corporate debt
housing market	account deficit	run sustainable	mortgage debt
property price	foreign exchange	sustainable development	household indebtedness
housing finance	capital account	sustainable growth	consumer debt
real house	real exchange	corporate sustainability	debt household
housing market	account surplus	highest sustainable	household loan
increase house	foreign currency	carbon economy	private debt
home owner	us dollar	green finance	debt disposable
housing supply	exchange market	environmental issue	consumer loan
housing bubble	account balance	carbon emission	debt income
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 s	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		Private 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)	-0.162 (0.136)	-0.749*** (0.168)
Inflation rate (%)		-0.039 (0.039)		-0.022 (0.016)		-0.009 (0.064)		-0.095 (0.069)
Interest rate (%)		-0.037 (0.027)		0.034*** (0.012)		-0.025 (0.049)		-0.159*** (0.052)
GDP growth (log)		0.428 (0.714)		0.581*** (0.191)		-1.729** (0.700)		-1.358* (0.695)
Financial dev. index		-0.436 (1.052)		-0.570 (0.463)		-1.665 (1.728)		7.238*** (1.707)
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		Private 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)	-0.238** (0.102)	-0.540*** (0.144)
Inflation rate (%)		-0.109** (0.053)		-0.067* (0.038)		0.054 (0.046)		-0.120** (0.053)
Interest rate (%)		0.004 (0.031)		0.006 (0.027)		-0.021 (0.031)		-0.052 (0.033)
GDP growth (log)		2.911*** (1.123)		3.617*** (0.631)		1.282* (0.751)		0.843 (0.827)
Financial dev. index		1.121 (1.107)		0.475 (0.944)		-0.365 (0.981)		4.248*** (1.049)
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		Private 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)	-0.237** (0.102)	-0.567*** (0.139)
Inflation rate (%)		-0.118*** (0.045)		-0.023 (0.042)		0.029 (0.033)		-0.115*** (0.037)
Interest rate (%)		0.008 (0.028)		-0.005 (0.025)		-0.008 (0.028)		-0.035 (0.028)
GDP growth (log)		-0.663 (0.873)		2.132*** (0.594)		0.580 (0.562)		-0.101 (0.551)
Financial dev. index		0.550 (1.120)		0.470 (0.928)		-0.464 (0.952)		3.929*** (1.015)
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		Private 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)	-0.189* (0.101)	-0.491*** (0.171)
Inflation rate (%)		-0.021 (0.072)		0.018 (0.040)		0.072 (0.064)		-0.101 (0.083)
Interest rate (%)		-0.031 (0.046)		0.052 (0.034)		-0.015 (0.046)		-0.062 (0.054)
GDP growth (log)		-0.124 (2.253)		-0.973 (1.102)		-0.538 (1.414)		1.250 (1.794)
Financial dev. index		3.513 (2.334)		-0.780 (1.526)		-1.078 (2.100)		5.935** (2.391)
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

Note: *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

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

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

	Private debt		
	(1)	(2)	(3)
QE	-0.361* (0.188)	-0.511*** (0.129)	-0.481** (0.199)
Inflation rate (% change of cpi)	-0.036 (0.029)	-0.048* (0.027)	-0.019 (0.045)
GDP (log)	-0.425 (0.295)	-0.190 (0.235)	-1.662** (0.726)
Financial development index	2.442*** (0.739)	1.984*** (0.649)	2.787*** (0.944)
Interest rate (%)	-0.016 (0.017)	-0.020 (0.016)	-0.002 (0.027)
CBI index			-0.704 (0.839)
Transparency index	0.014 (0.032)		0.010 (0.038)
Number of paragraphs	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)
Central bank FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	892	1,095	688
Adjusted R ²	0.341	0.341	0.290

Note: *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.

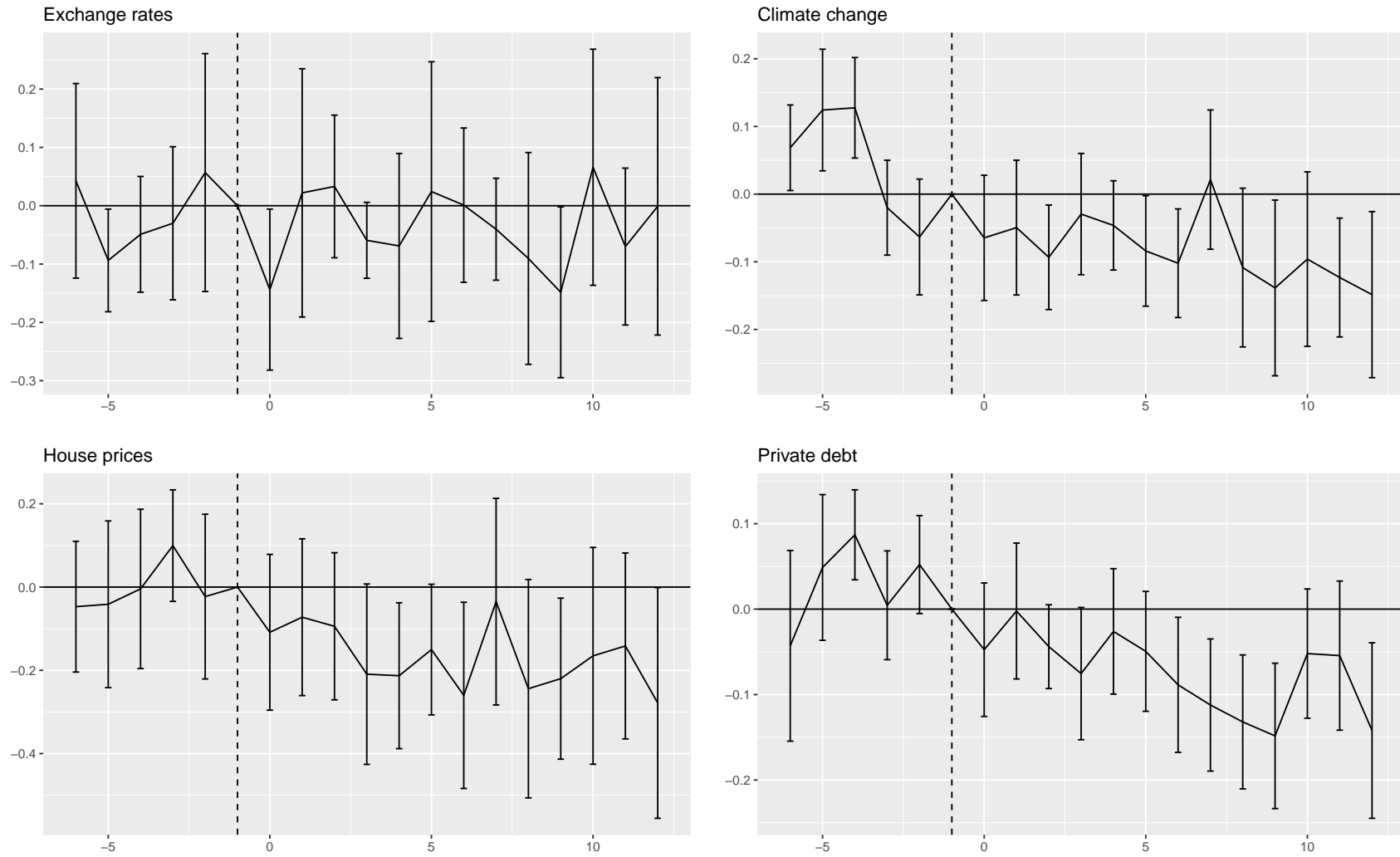
Event studies have been a popular tool for the analysis of financial market data. They aim to assess systematic changes in an outcome variable before and after a specific event of interest. The focus of these analyses therefore is not on calendar year-quarters t but on event year-quarters τ . The objective 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		Household debt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
QE	-0.206 (0.132)	-0.131 (0.193)	-0.558*** (0.114)	-0.414*** (0.119)	-0.181 (0.139)	-0.566*** (0.136)	0.154 (0.121)	0.053 (0.133)	-0.158 (0.111)	-0.306* (0.170)
Fed-BoE	0.291** (0.141)	1.598 (1.168)							0.144 (0.133)	0.841 (0.696)
ECB-BoJ			0.511*** (0.100)	4.893*** (1.475)	0.678*** (0.122)	-1.152 (1.249)	0.438*** (0.116)	-1.248 (0.829)		
QE x Fed-BoE	-0.394 (0.237)	-0.826*** (0.259)							-0.091 (0.211)	-0.328 (0.248)
QE x ECB-BoJ			0.090 (0.134)	0.423*** (0.158)	-0.581*** (0.194)	-0.470** (0.228)	-0.643*** (0.180)	-0.424** (0.204)		
GDP growth (log)		0.415 (0.377)		0.883*** (0.305)		-0.437* (0.258)		-0.284* (0.166)		0.214 (0.218)
Inflation rate		-0.043 (0.034)		-0.014 (0.031)		-0.015 (0.027)		-0.005 (0.022)		-0.062** (0.027)
Interest rate		-0.010 (0.022)		0.032 (0.020)		0.008 (0.017)		-0.020 (0.013)		-0.019 (0.016)
Fin. dev. index		-0.719 (0.758)		0.618 (0.640)		0.873 (0.671)		-0.541 (0.479)		2.765*** (0.636)
Property prices		0.018 (0.065)								
Nominal effective exchange rate				0.002 (0.207)						
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)	0.001*** (0.0001)	0.001*** (0.0001)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1,326	998	1,326	1,017	1,326	1,017	1,326	1,017	1,326	1,017
Adjusted R ²	0.556	0.612	0.569	0.643	0.363	0.419	0.568	0.565	0.306	0.324

Note: Standard errors are corrected for heteroscedasticity.

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

Note: Complete version of Table 5. All models with central bank fixed effects.