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Four Facts about International Central Bank Communication*

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Abstract

This paper introduces a novel database of text features extracted from the speeches of 53 central banks from 1996 to 2023 using state-of-the-art NLP methods. We establish four facts: (1) central banks with floating and pegged exchange rates communicate differently, and these differences are particularly pronounced in discussions about exchange rates and the dollar, (2) communication spillovers from the Federal Reserve are prominent in exchange rate and dollar-related topics for dollar peggers and in hawkish sentiment for others, (3) central banks engage in FX intervention guidance, and (4) more transparent institutions are less responsive to political pressure in their communication.

Keywords: Exchange Rates, Natural Language Processing (NLP), International Spillovers, Monetary Policy.

JEL classification: C55, E42, E5, F31, F42.

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1 Introduction

Our analysis utilizes a database of speeches from 53 central banks worldwide,[1] from which we extract difficult-to-measure text features using a collection of Large Language Models (LLMs) fine-tuned for analysing central bank speech text. The advantage of LLMs is their ability to process sequences of text, such as sentences and paragraphs, and to understand complex linguistic structures, idiomatic expressions, and nuanced phrases often used in central bank communications.[2] Fine-tuning the LLMs allows us to extract a wide variety of text features. This enables us to measure different dimensions of the text, and with greater precision, than would be possible using the traditional NLP methods that to-date have been used to study international central bank communication.[3]

We make two main contributions to the literature. First, we employ state-of-the-art natural language processing methods, LLMs, to accurately identify and analyze the textual content of a large panel of speeches from 53 central banks. This allows us to extract novel textual features that capture important aspects of international central bank communication.

Second, we establish four novel facts based on a subset of 21 central banks that have a sufficiently high frequency of speeches to allow us to construct high-quality quarterly text features: In *Fact 1*, we show that the characteristics of international central bank communication are strongly influenced by exchange rate regimes, and we uncover a systematic difference in the communication focus of central banks with pegged exchange rates in response to changes in the real effective exchange rate. Addressing the key role of the Federal Reserve, *Fact 2* documents spillovers from the Federal Reserve's communication sentiment to other central banks, and shows that the Federal Reserve's exchange rate communication

[1] These speeches are sourced from the Bank for International Settlements (BIS) archive: https://www.bis.org/cbspeeches/index.htm. The original dataset and any subsequent updates will be available for download here: https://www.nber.org/research/data/international-finance-and-macroeconomics-catalogue-data-sources.

[2] The recent advancements demonstrated by ChatGPT, which utilizes technologies akin to those applied in this research, exemplify the capabilities of large language models.

[3] The LLMs used in this paper are based on the Transformer architecture that also underlies the GPT-3.5 and GPT-4 models of OpenAI's ChatGPT. See Bertsch, Hull, Lumsdaine and Zhang (2022) for more details.

appears to play an important coordinating role for central banks with currencies pegged to the U.S. dollar. In *Fact 3*, we show that the novel text features introduced in this paper reveal how central banks use communication to provide guidance on future foreign exchange interventions, thereby confirming the relevance of the information we extract from central bank speeches. Finally, we establish in *Fact 4* that domestic factors, such as political pressures, can be important drivers of central bank communication focus. We find that central bank transparency mitigates the effect of the political pressure on central bank communication.

Our paper builds on the extensive literature on central bank communication by revisiting some of its key issues in an international context. Communication is an important part of a central bank's policy toolkit (Blinder, Ehrmann, Fratzscher, de Haan and Jansen, 2008a) and is released through a variety of different channels, including monetary policy announcements, press conferences, minutes, inflation reports and speeches. Communication helps central banks to achieve their macroeconomic objectives by providing information about the economic outlook (Cieslak and Schrimpf, 2019; Hansen, McMahon and Tong, 2019) and by influencing market expectations about future central bank policy (Hansen and McMahon, 2016). We study central bank speech data not only because of its availability for a large number of countries, but also because speeches are less structured than other forms of central bank communication, such as announcements, which usually follow a rigid format. Consequently, speeches may contain information that reveals subtle changes in central banks' views and policy stances that are intended to prepare markets for future policy actions.

Indeed, recent work by Cieslak and McMahon (2023) highlights the importance of information contained in speeches by central bank officials. Focusing on the large amount of movements in long-term interest rates and aggregate stock market returns in the U.S. that occur in the inter-meeting period, i.e., in the days following a FOMC policy announcement, the authors find that the information contained in speeches by Federal Reserve officials can account for the overall effect on the risk premium. This suggests that our text features constructed from international central bank speeches may be a good source of information that

allows us to uncover the focus of central bank communication across institutions and over time. Moreover, the rich international dimension of the central bank speech database enables us to identify internal and external factors that influence central bank communication.

Our paper is also related to the international finance literature on international spillovers of monetary policy (e.g., Miranda-Agrippino and Rey, 2022) and the central role of the Federal Reserve over the financial cycle. Exchange rate regimes have been studied extensively (Ilzetzki et al., 2022), and research on foreign exchange interventions has documented that exchange rate stabilization (Jansen and De Haan, 2005; Fratzscher, 2006; Eichler and Littke, 2018) is an important goal of central banks, with attempts to influence the level of exchange rates (Fratzscher, 2008; Mirkov et al., 2019) not being uncommon. Finally, we also study the role of institutional factors in international central bank communication, building on the extensive literature on central bank independence (Dincer and Eichengreen, 2007; Grilli et al., 1991; Cukierman, 1992; Alesina and Summers, 1993), transparency (Faust and Svensson, 2001; Lustenberger and Rossi, 2020), and political influence (Geraats, 2002; Binder, 2021).

The paper is organized as follows. Section 2 introduces the various datasets used in this paper and describes the text features and how they are constructed. Section 3 presents the four facts about international central bank communication. Finally, Section 4 concludes. An Online Appendix accompanies this paper.

2 Data

This paper uses several different datasets. First, we use a novel dataset of international central bank communication text features that has been selected to be shared through the NBER program "International Finance and Macroeconomic Data Sources." This dataset provides text features generated from speeches for 53 central banks from 1996Q1 to 2023Q2 and is described in more detail below. Second, we use a dataset that contains macro variables from the FRED database maintained by the Federal Reserve Bank of St. Louis, from

the International Financial Statistics (IFS) database of the International Monetary Fund (IMF), and indirectly from Haver Analytics. Third, we use an FX intervention dataset from Adler, Chang, Mano and Shao (2021), which contains quarterly public data and proxies for FX interventions for 122 central banks from 2000Q1 through 2022Q4. Fourth, we use the Ilzetzki, Reinhart and Rogoff (2019, 2022) dataset classifying exchange rate regimes for 194 central banks from 1946 to 2019. Fifth, we use the central bank transparency database from Dincer, Eichengreen and Geraats (2022), containing annual estimates of political, economic, procedural, policy, and operational transparency for 112 central banks from 1998 to 2019. And sixth, we use the central bank political pressure database from Binder (2021), which provides quarterly measures of political pressure using a narrative approach for 118 central banks from 2010Q1 to 2019Q1.

2.1 Text Features

Our international central bank communication dataset contains text features that are constructed using a collection of large language models (LLMs) introduced in Bertsch, Hull, Lumsdaine and Zhang (2022) to perform two tasks: measurement of semantic textual similarity (STS) and zero shot classification (ZSC). STS allows us to measure the closeness of two statements with respect to their semantic content. We can, for instance, check the extent to which paragraphs from two different speeches are related. And ZSC allows us to classify a passage of text without specifically training the model on the labels used. For example, we can classify whether a sentence discusses inflation.

These models were initially pre-trained on the Toronto BookCorpus (800 million words) and the English language Wikipedia (2500 million words). Bertsch et al. (2022) extended the pre-training and fine-tuning of the model used to perform STS. To do this, they constructed a dataset of central banking-related paper abstracts, derived from the S2ORC database (Lo et al., 2020). A detailed description of the methods and models used can be found in Bertsch et al. (2022). We apply the same models to a different corpus and also extract a different set

of features by using prompts that are focused on international economics and finance topics.

In this paper we use nine text features. The five STS text features – *financial crisis*, *U.S. dollar*, *bank capital or liquidity*, *international trade*, and *hawkish sentiment* – allow us to measure the extent to which a speech paragraph discusses these issues. The STS text features provide a measure of similarity between speech passages and the concept of interest. This comparison is performed by using the model to map both the passage and concept of interest to 768-dimensional embedding vectors. These vectors are then compared using cosine similarity.

Similarly, the ZSC text features – *output growth or employment*, *financial stability*, *inflation*, and *exchange rate* – report a classification score for categories that are external to the model training. The scores can be interpreted as a probability distribution over these categories using intermediate semantic representations that describe each of the new categories. Table A1 in the Online Appendix gives an overview of the nine text features, and Table A2 gives an example of ZSC with an LLM from Bertsch et al. (2022), where we classify whether a statement is about one of four topic categories or candidate classes. Moreover, Tables A6 and A7 in the Online Appendix give five examples of passages with a high classification score for exchange rates and the dollar, from each of the Fed, the ECB, and the rest of the central banks.

2.2 Sample Coverage

The text features are extracted from speeches given by 53 central banks over the period 1996–2023. Each institution included in our database has at least 50 speeches in the BIS archive. All speeches were either delivered in or translated into English prior to inclusion in the archive. For central banks with at least two speeches per quarter on average over the sample period, we construct the text features by taking the average score of the text features extracted from speeches given by the central bank at a quarterly frequency. The resulting dataset contains 21 central banks: the Federal Reserve System, the European Cen-

tral Bank (ECB), the Bank of Japan, and the Bank of England, as well as the central banks of Albania, Australia, Canada, France, Germany, India, Ireland, Italy, Malaysia, Norway, the Philippines, Singapore, South Africa, Spain, Sweden, Switzerland, and Thailand. In this paper, we rely exclusively on the this dataset of 21 central banks and quarterly text features.[4]

2.3 Data Transformation and Missing Values

Each text feature is standardized using the mean and standard deviation calculated over the period 1996–2010. The text feature data contain missing values (NaN) for institutions that do not have speeches in the database for all periods. We use linear interpolation to impute the missing values; however, there are very few missing values in the quarterly text feature database. The quarterly FRED macro dataset is also missing some values for institutions. We tried to look for alternative data sources to assemble a complete dataset with key variables: the central bank policy rate, the inflation rate, and the exchange rate.[5] The list of variables can be further expanded to include more financial and real economic variables.

3 Facts

In this section we present four facts about international central bank communication. Each fact is supported by empirical evidence, presented either graphically (via figures) or quantitatively (via regression tables). We discuss the significance and the broader implications of each fact within the existing literature, highlight the contributions we make in this paper, and outline avenues for further empirical validation.

[4]The regression analysis with the annual sample generates similar qualitative results as the quarterly sample. However, the significance levels are lower due to the limited speech data.

[5]We winsorize the text features and economic variables at 1% and 99%, but the results are robust to no winsorization.

3.1 Fact 1: Communication Clustering and Focus: Peggers vs. Floaters

Central banks around the world grapple with economic fluctuations resulting from common global shocks. They also face potential spillovers or interdependencies in their monetary policy stances. Yet, the way in which central banks tackle these issues is shaped by their specific domestic needs and arrangements. This raises the question of how similar central bank communication is across jurisdictions and whether there are identifiable communication clusters along important dimensions.

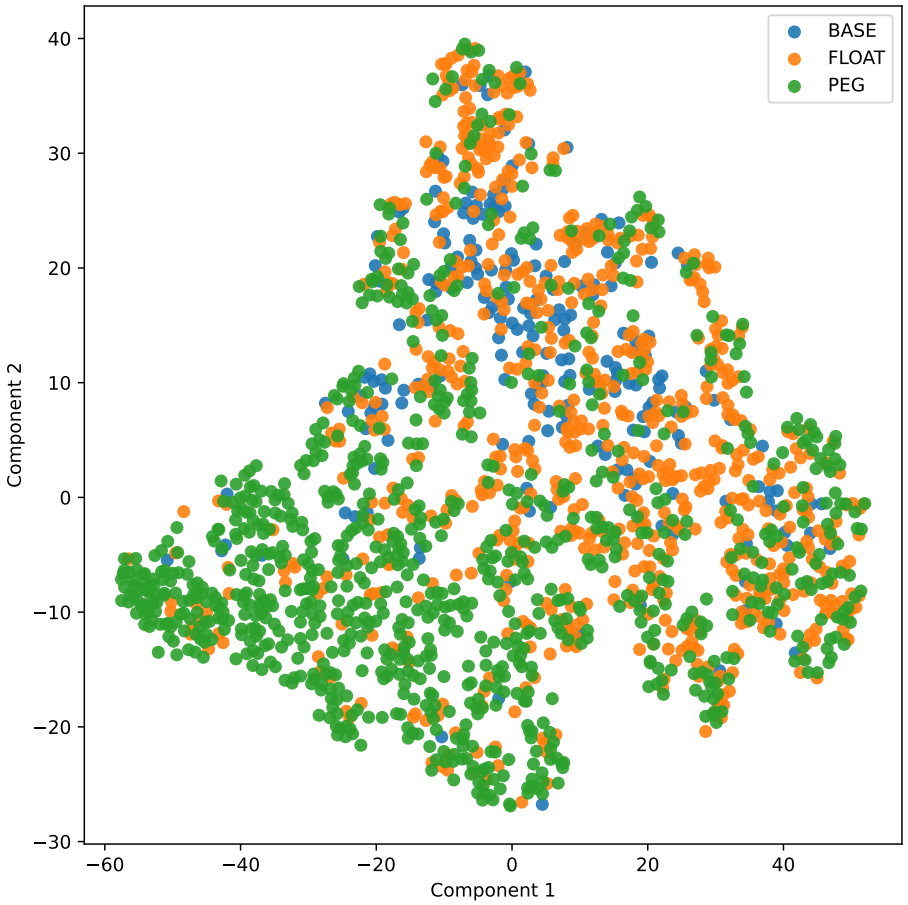
Focusing on central bank speech sentiment, Armelius, Bertsch, Hull and Zhang (2020) document that co-movement in sentiment across jurisdictions is not reducible to trade or financial flow exposures. They also find that there are international spillovers in communication sentiment, as well as from sentiment to policy rates and to unemployment, with the Federal Reserve System generating particularly large and persistent spillover effects. In Fact 1, we go beyond sentiment and analyze the commonalities in the discussion of policy issues across central banks. The main finding is summarized below.

Fact 1. *Central banks exhibit discernible clustering in their communication, which is particularly influenced by their exchange rate regimes. Moreover, there is a systematic difference in the communication focus on the U.S. dollar and on financial stability concerns in response to changes in the real effective exchange rate by central banks with pegged exchange rates, versus those with floating exchange rates.*

To establish Fact 1, we first analyze clustering in the content of speeches. Specifically, we cluster on all text features, aggregated up to an annual frequency. Thereafter, we perform dimensionality reduction using the t-distributed stochastic neighbor embedding (t-SNE) introduced in van der Maaten and Hinton (2008), which is an effective tool for differentiating between and visualizing clusters.

The visualization based on the t-SNE approach is shown in Figure 1, where the markers

Figure 1: t-SNE: Text Features



Notes: The figure visualizes the output of the t-stochastic nearest neighbors (t-SNE) algorithm applied to the exchange rate, U.S. dollar and international trade text features (see Section 2.1) for all 21 central banks with text features aggregated to quarterly frequency over the period between 1996 and 2023. Adopting the Ilzetzki et al. (2019, 2022) and Jordà et al. (2016) classification for floaters and peggers, we construct three categories for the visualization: "base" currencies in blue (U.S. dollar/Federal Reserve System, Euro/European Central Bank), floating currencies in orange, and pegged currencies in green, which includes the national central banks of the euro area.

represent the position of the different central banks at a given time. We can see that there are clearly recognizable clusters when we split the sample into exchange rate floaters (orange markers) and peggers (green markers), using the Ilzetzki et al. (2019, 2022) and Jordà et al. (2016) classification. In particular, the Federal Reserve, together with the ECB, form a distinct cluster (blue markers) inside of the floating exchange rate cluster, but near the edge of the cluster with peggers. The closeness of this cluster to the peg cluster may reflect the sensitivity of peggers to communication about the currency to which they are pegged.

Building on this insight, we next address the broader question of where these systematic differences in the central bank communication lie. To do so, we employ panel data regressions to analyze the communication focus of central banks as captured by the text features generated with large language models. Specifically, we regress the text features on control variables, including a lagged dummy variable $PEG_{i,t-1}$ that takes the value one for central banks operating a pegged exchange rate regime in year $t-1$, which we construct based on Ilzetzki et al. (2019, 2022), and its interaction term with changes in the lagged real effective exchange rate (REER):

$$\begin{aligned}\tau_{i,t} = \quad & \alpha + \beta_0 PEG_{i,t-1} + \beta_1 \Delta REER_{i,t-1} + \beta_2 PEG_{i,t-1} \times \Delta REER_{i,t-1} \\ & + \beta_3 REER_{i,t-1} + \beta_4 X_{i,t-1} + \gamma_i + \delta_t + \epsilon_{i,t},\end{aligned} \tag{1}$$

where $\tau_{i,t}$ are the text features of interest, and $X_{i,t-1}$ contains lagged macroeconomic variables, such as the inflation rate, the central bank policy rate, and the real GDP growth rate. Central bank (CB) fixed effects γ_i and the year-quarter fixed effects δ_t are included in the regressions.

The regression results in Table 1 show that the central bank communication text features are not significantly different between floating exchange rate countries and pegged exchange rate countries, across the six topics we examined: exchange rate, inflation, international trade, U.S. dollar, financial crisis, and financial stability. The quarterly changes in the

Table 1: Central Bank Communication Heterogeneity: Peggers vs. Floaters

	(1) exchange rate	(2) inflation	(3) int. trade	(4) USD	(5) financial crisis	(6) financial stability
$PEG_{i,t-1}$	0.145	0.084	-0.017	0.015	0.155	-0.328
	(0.177)	(0.202)	(0.187)	(0.193)	(0.196)	(0.246)
$\Delta REER_{i,t-1}$	-0.009	0.021*	-0.001	0.005	-0.003	-0.015*
	(0.008)	(0.012)	(0.008)	(0.012)	(0.009)	(0.008)
$PEG_{i,t-1} \times \Delta REER_{i,t-1}$	-0.007	-0.000	-0.010	-0.023*	-0.013	0.024**
	(0.013)	(0.016)	(0.014)	(0.012)	(0.019)	(0.010)
$REER_{i,t-1}$	0.006	-0.009*	0.000	-0.007	-0.001	0.007
	(0.007)	(0.004)	(0.004)	(0.006)	(0.008)	(0.005)
Controls	YES	YES	YES	YES	YES	YES
CB FE	YES	YES	YES	YES	YES	YES
Year-quarter FE	YES	YES	YES	YES	YES	YES
Std. Err.	CB	CB	CB	CB	CB	CB
No of obs	1511	1511	1511	1511	1511	1511
Adj. R^2	0.180	0.204	0.124	0.198	0.249	0.162

Notes: The table reports the coefficient estimates of the regression (1) with standard errors (in parentheses) clustered at the central bank (CB) level. The control variables include the economic controls (interest rates, inflation rates, and real GDP growth rates), as well as central bank and year-quarter fixed effects. Each column shows the result for a central bank communication text feature. * $p < .1$, ** $p < .05$, *** $p < .01$.

REER are significantly positively correlated with the inflation discussion and significantly negatively correlated with the financial stability text feature. The impact of exchange rate appreciations on inflation hinges on the extent of exchange rate pass-through and whether such appreciations align with anticipated improvements in the domestic economic outlook. Consequently, our findings highlighting an evolving discourse on the intricate interplay between exchange rate appreciations and inflation are not unexpected, while the decrease in discussions of financial stability concerns is consistent with an improved domestic outlook and the stabilizing role of capital inflows.

These text features are affected differently by the movements of exchange rates, however, pointing at an interesting heterogeneity between peggers and floaters. Specifically, central banks with a pegged exchange rate are more likely to discuss the U.S. dollar in their communication when the domestic currency faces depreciation pressure. At the same time, appreciation pressure leads to more discussion on financial stability for pegged exchange rate country central banks, which is consistent with their greater susceptibility to surges in capital inflows and the risk of subsequent currency and financial crises (Levy-Yeyati and Sturzenegger, 2003).

Taken together, we document the information content of speeches in terms of text features and find that the exchange rate regimes play an important role. Next, Section 3.2 discusses the sensitivity of peggers to base currency central bank communication, estabishing a coordinating role for the central banks controlling anchor currencies to which other currencies are pegged.

3.2 Fact 2: Communication Spillovers and Exchange Rate Regimes

While central banks with floating exchange rate regimes communicate more with the public overall across several transparency dimensions (Lustenberger and Rossi, 2020), our previous analysis suggests that peggers' communication still closely tracks the major currency discussions (the USD topic, in particular). This proximity likely reflects strong spillovers

from major anchor currency central banks, most notably the Federal Reserve, to peggers. We would expect these effects to play a particularly prominent role in exchange rate related discussions. We first summarize our main findings.

Fact 2. *Communication spillovers are shaped by exchange rate regimes. Speeches by Federal Reserve officials are associated with spillovers of hawkish sentiment for non-dollar peggers and with spillovers of exchange rate and dollar-related issues for peggers.*

Building on the clustering patterns identified in Fact 1 and the nuanced speech content analysis, this section explores the question of how the Federal Reserve's communication influences other central banks in the global monetary system. Going beyond the central bank sentiment spillovers analyzed in previous research (Armelius et al., 2020), we are interested in the coordinating role of the Federal Reserve when it comes to discussing issues such as the exchange rate and the U.S. dollar.

To establish this fact, we include Federal Reserve text features as explanatory variables:

$$\tau_{i,t} = \alpha + \beta_0 \tau_{us,t} + \beta_1 \Delta REER_{i,t-1} + \beta_2 REER_{i,t-1} + \beta_3 X_{i,t-1} + \gamma_i + \delta_t + \epsilon_{i,t}, \qquad (2)$$

where the coefficient β_0 captures the coordination (or correlation) of communication text features between the central bank in country i (which excludes the U.S.) and the Federal Reserve. It is reasonable to assume that there is a common trend in text features that is largely influenced by the Federal Reserve, given the special reserve currency role of the dollar.

Table 2 shows that only the non-USD pegged central banks share the same communication sentiment as the Federal Reserve, which is consistent with the findings in Armelius et al. (2020). On the other hand, the USD-pegged central banks share the same communication pattern on exchange rate and USD topics, with statistical significance on the exchange rate topic.

Taken together, Facts 1 and 2 examine the clustering in central bank communication and document how exchange rate regimes determine differences in the focus of central bank

Table 2: Central Bank Communication Spillovers from the Federal Reserve.

	(1) exchange rate	(2) USD	(3) hawkish sentiment	(4) exchange rate	(5) USD	(6) hawkish sentiment
exchange rate$_{us,t}$	0.009			0.067*		
	(0.043)			(0.026)		
USD$_{us,t}$		-0.007			0.144	
		(0.027)			(0.070)	
hawkish sentiment$_{us,t}$			0.087***			0.142
			(0.023)			(0.094)
$\Delta REER_{i,t-1}$	-0.008	-0.003	0.006	-0.030	-0.008	0.035*
	(0.007)	(0.008)	(0.013)	(0.013)	(0.022)	(0.012)
$REER_{i,t-1}$	0.011	-0.011	-0.011*	-0.000	-0.027*	-0.037**
	(0.010)	(0.008)	(0.006)	(0.009)	(0.010)	(0.011)
Controls	YES	YES	YES	YES	YES	YES
USD Pegging	NO	NO	NO	YES	YES	YES
CB FE	YES	YES	YES	YES	YES	YES
Year-quarter FE	YES	YES	YES	YES	YES	YES
Std. Err.	CB	CB	CB	CB	CB	CB
No of obs	1128	1128	1128	184	184	184
Adj. R^2	0.150	0.233	0.117	0.229	0.324	0.230

Notes: The table reports the coefficient estimates from regression (2) with standard errors (in parentheses) clustered at the central bank level. The control variables, comprising the lagged text features and the economic controls (interest rates, inflation rates, and real GDP growth rates), are always included. The subsequent rows report the use of central bank (CB) and year-quarter fixed effects, the number of observations, and the adjusted R^2. We run the regression on the subsample of non-USD pegged central banks in columns (1)-(3) and the subsample of USD pegged central banks in columns (4)-(6). Each column presents the regression result for a text feature extracted from the central bank communication database. * $p < .1$, ** $p < .05$, *** $p < .01$.

communication and the nature of communication spillovers. Interesting avenues for future research include studying the coordination of central bank communication during episodes such as the Great Financial Crisis, and the comovement of central bank communication over the business and financial cycles.

3.3 Fact 3: FX Intervention Guidance

So far, we have focused on communication patterns and on determinants of communication emphasis. Next, we shift attention to the use of central bank communication to conduct a specific policy, namely foreign exchange (FX) intervention. We are interested in the question of whether the communication of central banks can predict their subsequent FX interventions, and whether there are differences between central banks operating under pegged and floating exchange rate regimes in their use of guidance regarding future FX interventions. Our main findings can be summarized as follows.

Fact 3. *Central bank officials actively use FX intervention guidance in their speeches, especially when discussing exchange rate-related issues, but peggers and floaters differ in the direction of FX intervention guidance.*

Central bank communication aims to achieve certain goals. The existing literature establishes that central bank communication is an important and effective tool to signal future monetary policy changes (Hansen and McMahon, 2016), to provide information about economic conditions (Cieslak and Schrimpf, 2019; Hansen, McMahon and Tong, 2019), and to stabilize (Jansen and De Haan, 2005; Fratzscher, 2006; Eichler and Littke, 2018) or influence (Fratzscher, 2008; Mirkov et al., 2019) exchange rates, especially when followed by actual FX interventions (Beine, Janssen and Lecourt, 2009).

The focus of Fact 3 is on the frequently used policy tool of FX intervention and to establish evidence that the future use of this tool is signaled by communication. Based on a BIS survey of central banks, Patel and Cavallino (2019) state that the goals of FX intervention are to

maintain price stability and to curb speculation. Moreover, intermediate objectives include limiting exchange rate volatility, limiting pressure from international investors, providing liquidity to thin markets, and influencing the exchange rate level. On a conceptual level, FX interventions may influence exchange rates because of inefficiencies stemming from partially segmented markets (Fanelli and Straub, 2021), or because they allow central banks to credibly share information when they have a role in aggregating and disseminating the information from market participants (Popper and Montgomery, 2001).

Using data from press reports, Fratzscher et al. (2019) find that FX interventions are more likely to be successful in moving and smoothing the exchange rate when accompanied by oral interventions by central bank officials. Additionally, officials from central banks with a floating exchange rate regime talk about FX interventions more frequently. In this section, we complement Fratzscher et al. by establishing that communication paves the way for subsequent FX interventions, i.e., our text features from central bank speeches help to predict interventions. This finding resonates with the idea of "FX forward guidance" rationalized in Fanelli and Straub (2021), who study FX interventions theoretically and characterize principles of optimal FX intervention. Importantly, Fanelli and Straub find that optimal policy involves promises of future FX intervention. This result resonates with a BIS survey of central banks in which the respondents confirm the potency of signaling future FX intervention.

To measure whether central bank speeches contain information about future FX interventions and thus provide guidance to market participants, we run a predictive regression:

$$FXI_{i,t} = \alpha + \beta_0 \tau_{i,t-1} + \beta_1 \Delta REER_{i,t-1} + \beta_2 REER_{i,t-1} + \beta_3 X_{i,t-1} + \gamma_i + \delta_t + \epsilon_{i,t}. \quad (3)$$

The dependent variable $FXI_{i,t}$ is the FX intervention measure for country i at time t from Adler et al. (2021), which provides a proxy for FX interventions based on active transactions in spot markets and with derivatives by a country's central bank that change its foreign

currency position, regardless of intent. A positive reading for $FXI_{i,t}$ indicates FX purchases are more frequent than sales in the data (Fratzscher et al., 2019). We employ the quarterly measure, which is based on balance-of-payments (BOP) data, where available, and does not require adjustment for valuation effects. As explanatory variables we use lagged values of central bank communication text features $\tau_{i,t-1}$, as well as lagged values of the real effective exchange rate $REER_{i,t-1}$ and its change $\Delta REER_{i,t-1}$ and a vector of controls $X_{i,t-1}$ that include the lagged macro controls interest rates, inflation, and real GDP growth. All regressions use clustered standard errors at the level of the central bank. Additionally, we include fixed effects specifications, with both central bank fixed effects γ_i and year-quarter fixed effects δ_t.

We run the regression in (3), with the results reported in Table 3. Columns (1)-(3) show that the lagged exchange rate text feature can significantly predict FX interventions. Specifically, more discussion of exchange rate issues is positively associated with subsequent FX purchases.

These results are consistent with Parra-Polanía et al. (2024), who collect and classify public statements on FX communication for Colombia and Mexico, and find that communication aimed at weakening the domestic currency affects the exchange rate in the intended direction, while there is no evidence for the opposite. Therefore, consistent with Beine et al. (2009) and Fratzscher et al. (2019), we would expect communication about exchange rate concerns to be associated with FX purchases, since FX communication is known to be most effective when market participants believe it will be followed by action.

Next, we extend the regression by splitting the sample into two sub-samples, based on whether the currency of a central bank is not pegged (column 4) or pegged (column 5) to the U.S. dollar. Interestingly, the text feature on "USD" appears important for predicting the FX intervention for the subsample based on non-USD-peggers in column (4) and on USD-peggers in column (5), but in different ways. More discussion of the dollar is associated with future FX purchases by non-USD-peggers, while more discussion of the dollar by central

Table 3: Communication about Exchange Rates and FX Interventions

	(1) $FXI_{i,t}$	(2) $FXI_{i,t}$	(3) $FXI_{i,t}$	(4) $FXI_{i,t}$	(5) $FXI_{i,t}$
exchange rate$_{i,t-1}$	0.152*	0.120*	0.129	0.073	-0.033
	(0.077)	(0.065)	(0.079)	(0.056)	(0.056)
inflation$_{i,t-1}$	-0.035	0.008	0.025	-0.019	-0.177
	(0.033)	(0.019)	(0.027)	(0.040)	(0.141)
int. trade$_{i,t-1}$	-0.143	-0.120	-0.114	-0.133*	-0.269
	(0.106)	(0.094)	(0.091)	(0.064)	(0.238)
USD$_{i,t-1}$	-0.055	-0.101	-0.095	0.065*	-0.359*
	(0.045)	(0.077)	(0.073)	(0.035)	(0.140)
$\Delta REER_{i,t-1}$	0.007	0.001	-0.005	-0.007	0.169*
	(0.009)	(0.009)	(0.012)	(0.014)	(0.068)
$REER_{i,t-1}$	0.012*	0.003	0.003	0.015*	-0.043*
	(0.007)	(0.006)	(0.006)	(0.008)	(0.016)
Currency peg	ALL	ALL	ALL	NON-USD	USD
Controls	YES	YES	YES	YES	YES
CB FE	NO	YES	YES	YES	YES
Year FE	NO	YES	NO	NO	NO
Quarter FE	NO	YES	NO	NO	NO
Year-quarter FE	NO	NO	YES	YES	YES
Std. Err.	CB	CB	CB	CB	CB
No of obs	1295	1295	1295	964	231
Adj. R^2	0.024	0.056	0.047	0.068	0.106

Notes: The table reports the coefficient estimates from regression (3) together with standard errors (in parentheses) clustered at the central bank (CB) level. The control variables, comprising the lagged text features and the economic controls (interest rates, inflation rates, and real GDP growth rates), are always included. The subsequent rows report the use of central bank, year, quarter and year-quarter fixed effects, the number of observations, and the adjusted R^2. We run the regression on the full sample in the first three columns and then on two subsamples, the non-USD peggers and the USD peggers. * $p < .1$, ** $p < .05$, *** $p < .01$.

banks with an exchange rated pegged to the dollar is associated with future FX sales. Given that dollar peggers tend to be emerging markets in our sample, this finding resonates with column (4) of Table 1, suggesting that communication on the dollar topic is more frequent when the domestic currency is under devaluation pressure against the world currency.

Taken together, we find evidence of active use of FX intervention guidance for a large sample of countries. Several interesting research directions arise from our novel collection of central bank communication text features, which we leave for future research. Do more granular text features that capture concerns about a currency appreciation or depreciation provide a more nuanced understanding of FX intervention guidance? Can we find any information in the speeches that is indicative of a commitment to a policy of FX intervention over a longer time horizon, or information that indicates likely future actions, i.e. for Odyssean or Delphic forward guidance (Campbell et al., 2012; Hansen and McMahon, 2016)? Does the "leaning against the wind" documented for actual FX intervention (Fratzscher et al., 2019) extend to FX intervention forward guidance? And under what conditions is FX intervention (forward) guidance most effective?

3.4 Fact 4: Transparency and Communication

Previous facts have highlighted the important role of domestic and external economic factors as determinants of central bank communication around the world. In this section, we examine the institutional drivers of central bank communication, in particular central bank transparency, and the role of domestic political pressure. We are interested in the question of how transparency and political pressure affect central bank discussions about the exchange rate and the U.S. dollar, as well as their policy stance, as measured by hawkish sentiment. Our findings are summarized below.

Fact 4. *Central banks that resist political pressure also show this by communicating a more hawkish policy stance. But less so if they have a high level of transparency.*

Central bank transparency is often an expression of central bank independence (Dincer and Eichengreen, 2007). The institutional independence of central banks has clear merits on theoretical grounds and helps central banks to build credibility (Barro and Gordon, 1983; Rogoff, 1985; Persson and Tabellini, 1993; Walsh, 1995). There has been considerable empirical work on this subject, with many studies finding a positive association between greater central bank independence and lower average inflation, without harming other economic outcomes such as growth, financial stability and public finances (Grilli et al., 1991; Cukierman, 1992; Alesina and Summers, 1993; Romelli, 2022).

On a conceptual level, central bank transparency can be used to enhance the credibility of central banks to follow a policy closer to the socially optimal one (Faust and Svensson, 2001) and to help anchor inflation around its target, by clarifying the central bank policy objective function (Blinder et al., 2022). Moreover, clear and transparent communication by the central bank can help to coordinate the beliefs of agents in the economy, especially during market turmoil.

Despite the diversity across central banks in communication strategies and practices, there is a clear trend in central banking towards greater transparency, with central banks across all income levels and monetary policy strategies moving in that direction (Lustenberger and Rossi, 2020). This trend holds for both the strategic and operational long-term orientation of the central bank toward openness, but also for the frequency of speeches. Not surprisingly, the trend toward a higher frequency of speeches is least pronounced for peggers, who communicate less and display systematic differences in communication, as established in Fact 3. While more communication can reduce clarity by creating a "cacophony" of different voices (Blinder et al., 2008a), this problem likely is most pervasive in advanced economies.

In our study we use a transparency measure by Dincer et al. (2022), which captures five broad aspects of central bank transparency: political, economic, procedural, policy and operational. Notably, this measure differs from communication transparency, which is often related to the frequency or content of speeches.

While there are important benefits for monetary policy from institutional independence (Geraats, 2002), central banks may be subject to varying degrees of domestic political pressure even when they are *de jure* independent institutions.

Based on a survey of central bankers and academic economists, Blinder (2000) finds that credibility is earned through a strong track record. Moreover, autonomy from political interference is crucial for central banks' ability to build credibility. In our study we use a measure of political pressure by Binder (2021), who constructs a novel measure for political pressure and documents that such pressure, even for legally independent central banks, is associated with higher inflation outcomes.

We extend these findings by establishing direct evidence on the relationship between central bank transparency, political pressure, and our novel text features extracted from international central bank communication. Specifically, we address the question of how central bank transparency and political pressure shape communication by running the following regression:

$$\begin{aligned} \tau_{i,t} &= \alpha + \beta_0 Transparency_{i,t} + \beta_1 Pressure_{i,t} + \beta_3 Transparency_{i,t} \times Pressure_{i,t} \\ &\quad + \beta_4 \Delta REER_{i,t-1} + \beta_5 REER_{i,t-1} + \beta_6 X_{i,t-1} + \gamma_i + \delta_t + \epsilon_{i,t}, \end{aligned} \tag{4}$$

where $Transparency_{i,t}$ is a quarterly measure constructed from the international central bank transparency index of Dincer et al. (2022), and $Pressure_{i,t}$ is a quarterly measure constructed from the political pressure index of Binder (2021), which takes three possible values: no-pressure, resist-pressure, and succumb-pressure.[6] The measures by Binder (2021) are based on narrative information in country reports from the Economist Intelligence Unit (EIU) and Business Monitor International (BMI). In particular, the political pressure index is only available for a much smaller sample from 2010 to 2019. Therefore, we do not cluster standard errors at the central bank level in regressions that include this index.

[6]The transparency and political pressure indicators are annual, and we use the annual score for each quarter of the year.

Table 4: Central Bank Communication: Transparency and Political Pressure

	(1) exchange rate	(2) exchange rate	(3) exchange rate	(4) USD	(5) USD	(6) hawkish sentiment	(7) hawkish sentiment
$Transparency_{i,t}$	-0.158**		-0.023		-0.199**		0.081
	(0.064)		(0.064)		(0.077)		(0.080)
$Resist_{i,t}$		-0.359**	-0.543	-0.081	1.591	0.346*	2.377**
		(0.148)	(1.076)	(0.159)	(1.081)	(0.193)	(1.171)
$Succumb_{i,t}$		-0.080	-3.127	-0.171	-1.706	0.017	0.159
		(0.183)	(2.851)	(0.146)	(1.846)	(0.193)	(1.994)
$Resist_{i,t} \times$			0.017		-0.162		-0.187*
$Transparency_{i,t}$			(0.096)		(0.103)		(0.107)
$Succumb_{i,t} \times$			0.274		0.138		-0.013
$Transparency_{i,t}$			(0.256)		(0.162)		(0.168)
$\Delta REER_{i,t-1}$	-0.014	-0.016	-0.017	-0.015	-0.011	0.013	0.012
	(0.008)	(0.018)	(0.018)	(0.011)	(0.011)	(0.014)	(0.014)
$REER_{i,t-1}$	0.007	0.015***	0.016***	0.005	0.006	-0.010**	-0.009*
	(0.007)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)
Controls	YES	YES	YES	YES	YES	YES	YES
CB FE	YES	YES	YES	YES	YES	YES	YES
Year-quarter FE	YES	YES	YES	YES	YES	YES	YES
Std. Err.	CB	Robust	Robust	Robust	Robust	Robust	Robust
No of obs	1278	555	555	555	555	555	555
Adj. R^2	0.134	0.348	0.344	0.377	0.385	0.309	0.308

Notes: The table reports the coefficient estimates from regression (4) with standard errors (in parentheses) clustered at the central bank (CB) level in column (1) and with robust standard errors in columns (2)-(7), where the measures for political pressure reduce the sample size. The control variables, comprising the lagged text features and the economic controls (interest rates, inflation rates, and real GDP growth rates), are always included. The subsequent rows report the use of central bank and year-quarter fixed effects, the number of observations, and the adjusted R^2. Each column presents the regression result for a text feature extracted from the central bank communication database. * $p < .1$, ** $p < .05$, *** $p < .01$.

Column (1) of Table 4 shows that central banks with a higher level of transparency are less likely to talk about the exchange rate. This result is consistent with the different communication strategies used by central banks in advanced and emerging economies. Advanced economy central banks typically score higher on the transparency measure and often attempt to convey their decision-making process and mandates with the help of technical indicators or clarified decision rules that are constructed around an inflation targeting objective. On the contrary, emerging market economies tend to be more exposed to exchange rate fluctuations, and central banks in these countries are usually less transparent than central banks in advanced economies.[7]

Columns (2), (4), and (6) in Table 4 report regression results for text features related to exchange rate, USD, and the hawkish sentiment. We find a negative association between exchange rate discussions and the political pressure measure capturing the resistance, or attempted resistance, of central banks to actual, potential, or perceived government pressure. Conversely, there is a positive association with hawkish sentiment. In other words, central banks that resist political pressure talk less about the exchange rate and convey a more hawkish sentiment in their communication. The results for the U.S. dollar text feature are not statistically significant. Interestingly, we see no change in the textual features of central bank communication when the central bank succumbs to political pressure. Taken together, it appears that political pressure only affects central bank communication when the central bank resists it.

Next, we include the interaction terms between the resist-pressure and succumb-pressure measures by Binder (2021) and the transparency index by Dincer et al. (2022) in columns (3), (5) and (7) of Table 4. The results suggest that more transparent central banks communicate less, especially about the U.S. dollar, and more about topics related to their mandate, such as inflation. Moreover, central banks that resist political pressure communicate a more hawkish

[7]The effects of the transparency index on other text features are statistically insignificant and thus not reported in the table. If we restrict the sample to countries covered in the political pressure database, the result on the transparency index in Column (1) is not significant anymore, similar to the result in Column (3).

stance, but more transparent central banks do so less. This may reflect greater credibility and clarity about their strategies.

This section offers a first analysis of how transparency and political pressure shape international central bank communication. There remains considerable room for future research, such as on the role of different institutional aspects and on differences in the communication by individual appointees, depending on their background and political affiliation (Ioannidou, Kokas, Lambert and Michaelides, 2023).

4 Conclusion

Central bank speeches have proven to be an effective means of communication (Blinder et al., 2008b). Memorable phrases from speeches, such as Alan Greenspan's "irrational exuberance," Richard Fisher's "eighth inning," and Mario Draghi's "whatever it takes," are often repeated by the press and serve to anchor expectations about central bank decision-making. Most existing research on central bank communication focuses on a few advanced economies and a small number of text features, which do not fully capture the breadth of central bank communication across countries and over time.

This article introduces a novel database of text features from international central bank communication, generated using a collection of large language models fine-tuned on a corpus of central bank speech text. The use of state-of-the-art techniques from natural language processing allows us to extract difficult-to-measure features from speeches that provide insights into how central bank officials discuss important issues and concerns facing their institutions.

We establish four facts about international central bank communication that demonstrate the power of cutting-edge NLP methods to address research questions that complement previous findings in the existing literature and allow us to open up new directions. Our evidence underscores the diversity of communication strategies employed by central banks across different exchange rate regimes, which we relate to international and domestic eco-

nomic factors, as well as to institutional factors. Moreover, we document that the novel text features introduced in this paper reveal how central banks use communication to provide guidance on future foreign exchange interventions to achieve specific goals related to their exchange rate, thereby confirming the relevance of the information we extract from central bank communication.

We hope that the machine learning based NLP methods and the database we provide will allow researchers to deepen the understanding of the international dimension of central bank communication, building on a flexible construction of text features and narrative measures. There are a number of fruitful research directions, such as to build an LLM-generated credibility measure of central banks, to disentangle the political economy dimension of central bank communication, and to analyze the institutional aspects of central bank communication. We leave them for future research.

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A Online Appendix

Table A1: Text Features and Methods

Text feature	Method
financial_crisis	STS
united_states_dollar	STS
bank_concern	STS
international_trade	STS
hawkish_sentiment	STS
output_employment	ZSC
financial_stability	ZSC
inflation	ZSC
exchange_rate	ZSC

Notes: We use the methods semantic textual similarity (STS) and zero shot classification (ZSC). A detailed description of the methods and models can be found in Bertsch et al. (2022).

Table A2: Zero Shot Classification

Sequence	"Banks continue to play this role but it has become more challenging today to do so because some lenders find themselves capital constrained as a result of recent losses and or sizable unanticipated additions to their balance sheets of formerly off balance sheet instruments."
Candidate Classes	financial stability, output, inflation, labor market
Scores	0.718, 0.203, 0.048, 0.031

Notes: This example is taken from Bertsch et al. (2022), using a passage from a January 2009 speech given by Gary Stern, President of the Minneapolis Federal Reserve Bank.

Table A3: Subsamples with Text Features at Quarterly and Annual Frequencies

Quarterly + Annual	Albania, Australia, Canada, European Central Bank, France, Germany, India, Ireland, Italy, Japan, Malaysia, Norway, the Philippines, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom, United States
Annual	Bahrain, Barbados, Chile, China, Czech Republic, Denmark, Fiji, Finland, Ghana, Greece, Hong Kong, Iceland, Indonesia, Israel, Kenya, Macedonia, Malta, Mauritius, Mexico, the Netherlands, New Zealand, Pakistan, Papua New Guinea, Portugal, Romania, Serbia, South Korea, Sri Lanka, Trinidad and Tobago, Turkey, Uganda, Zambia

Notes: We construct text features at quarterly and annual frequencies for central banks with at least two speeches per quarter on average over the sample period 1996Q1-2023Q2. For all other central banks, we construct text features at an annual frequency only. We generate text features separately for the ECB and for the national central banks in the euro area.

Table A4: Variable Definitions

Variable	Description	Source
Text feature variables		
`exchange_rate`	Information related to the exchange rate in the CB speeches	Authors' calculation with LLMs
`international_trade`	Information related to international trade in the CB speeches	Authors' calculation with LLMs
`united_states_dollar`	Information related to the USD in the CB speeches	Authors' calculation with LLMs
`hawkish_sentiment`	The sentiment hawkishness in the CB speeches	Authors' calculation with LLMs
`financial_crisis`	Information related to financial crisis in the CB speeches	Authors' calculation with LLMs
`financial_stability`	Information related to financial stability in the CB speeches	Authors' calculation with LLMs
`output_employment`	Information related to output or employment in the CB speeches	Authors' calculation with LLMs
`inflation`	Information related to inflation in the CB speeches	Authors' calculation with LLMs
`bank_concern`	Information related to concerns over banks in the CB speeches	Authors' calculation with LLMs
Economic variables		
PEG	A dummy variable indicating whether the country is operating a pegged or floating exchange rate regime	Based on the coarse indicator by Ilzetzki, Reinhart and Rogoff (2019, 2022)
REER	Real effective exchange rate	IMF IFS
Inflation rate	Inflation rate of the country	FRED Federal Reserve Bank of St. Louis
CB policy rate	Central bank policy rate	IMF IFS
Real GDP growth	Real GDP growth rate	Haver / IMF IFS
FXI	The FX intervention measure normalized by GDP	Adler, Chang, Mano and Shao (2021)
Transparency	The transparency index of central banks	Dincer, Eichengreen and Geraats (2022)
Resist	A dummy variable indicating whether the CB resisted to political pressure	Binder (2021)
Succumb	A dummy variable indicating whether the CB succumbed to political pressure	Binder (2021)

Table A5: Summary Statistics

	Mean	SD	P25	Median	P75	N
Text feature variables						
exchange_rate	-0.174	0.849	-0.691	-0.259	0.275	2073
international_trade	-0.140	0.867	-0.722	-0.135	0.422	2073
united_states_dollar	-0.123	0.979	-0.805	-0.202	0.584	2073
hawkish_sentiment	-0.047	0.917	-0.689	-0.062	0.579	2073
financial_crisis	-0.062	0.868	-0.677	-0.090	0.563	2073
financial_stability	0.200	0.901	-0.392	0.203	0.808	2073
output_employment	0.016	1.027	-0.621	-0.018	0.622	2073
inflation	-0.069	1.016	-0.713	-0.261	0.378	2073
bank_concern	-0.035	0.993	-0.713	-0.071	0.570	2073
Economic variables						
REER	97.993	12.536	89.355	96.470	104.768	2310
Inflation rate	1.064	1.399	0.192	0.648	1.535	2278
Central bank policy rate	2.534	2.876	0.300	2.000	4.250	1813
Real GDP growth	0.006	0.021	0.001	0.007	0.012	1980
FXI	0.264	1.914	-0.020	0.000	0.160	1857
Transparency	9.767	2.172	8.500	10.500	11.000	1848

Notes: This table shows the summary statistics for all variables used in the empirical analysis. The sample covers the period 1996–2023. Where possible, we use central bank (country) level variables with quarterly frequencies.

Table A6: Text Feature Examples: Exchange Rate

Date	Institution	Passage
2007-05-04	US Federal Reserve System	How has the world fared under this diverse mixed of flexible and fixed exchange rate regimes? In general, I think, the costs of living with exchange rate volatility have been less than feared and attempts to limit volatility have been more damaging and less effective than expected.
2005-01-13	US Federal Reserve System	The world has lived with this system for some time. But this is not an ideal mix, either for the monetary system as a whole, or for those countries which permit very little variability in their real effective exchange rates, and it's probably not sustainable over time.
2007-05-04	US Federal Reserve System	Governments that found themselves in this position had very limited ability to mitigate the economic damage that was to come, but the policy choices that accompanied the exchange rate change often compounded the problem.
2020-02-21	US Federal Reserve System	... learned from earlier papers that have examined the performance of unconventional policy tools with respect to individual components of financial conditions—most notably, long-term sovereign yields, but also mortgage rates, equities, exchange rates, and corporate debt spreads.
2016-07-31	US Federal Reserve System	Also, trade seems likely to exert a net drag on growth. There are two factors at play here: the sluggish growth rate of aggregate demand abroad and the continuing impact of earlier dollar appreciation on United States export competitiveness.
2019-09-30	European Central Bank	The differences in monetary spillovers through expenditure switching under the exchange rate channel across these different invoicing settings can be illustrated by a scenario analysis using the structural model for the global economy used at the ECB.
2019-02-15	European Central Bank	But it is also true that, in the euro area, exchange rate pass-through has already notably declined over the past two decades, mainly due to the declining share of commodity imports and the increasing role of global value chains.
2017-07-11	European Central Bank	Two questions stand out. Do large-scale asset purchase programmes lead to exchange rate depreciation in the initiating country? And, if so, does monetary easing produce a beggar-thy-neighbour effect for other economies?
2019-02-15	European Central Bank	... to the extent that such flight-to-safety flows affect the exchange rate, the aforementioned reduced pass-through to import prices that international currencies imply also mitigate more direct effects on domestic prices.
2015-01-22	European Central Bank	The Governing Council will continue to closely monitor the risks to the outlook for price developments over the medium term. In this context, we will focus in particular on geopolitical developments, exchange rate and energy price developments, and the pass-through of our monetary policy measures.
2010-07-30	People's Bank of China	... the two reforms affect different enterprises. In the case of exchange rate reform, a stronger yuan is likely to affect the price competitiveness of exporters, but is a favorable change to enterprises that import large quantity of raw materials and semi-finished goods ...
2018-04-05	The Reserve Bank of Fiji	This compares with a transfer of 16.9 million to Government (13.9 million profits and one-fifth RAA totalling $3.0 million) for the seven month period ended 31 December 2015 with no transfers to the General Reserve Account.
2014-09-25	Reserve Bank of New Zealand	The Bank considers that the real effective exchange rate is unjustified when the level of the real exchange rate is inconsistent with the economic factors that typically explain its movement during the business cycle.
2020-06-01	The Bank of Albania	Third, the monetary stimulus has created the premises for a more stable exchange rate during 2019. Although the Bank of Albania was not present in the domestic foreign exchange market to affect the exchange rate, the establishment of a calm monetary environment supported its stabilisation.
2013-04-17	Reserve Bank of India	It should also be clear that a failed defence of the exchange rate is worse than no defence. So, when you are intervening in the forex market, it is important to make sure that your intervention is successful.

Notes: The table provides examples of statements with a high classification score for the `exchange_rate` feature.

Table A7: Text Feature Examples: U.S Dollar

Date	Institution	Passage
2004-03-02	US Federal Reserve System	Other East Asian monetary authorities, in an endeavor to hold their currencies at a par with the yen and the renminbi, accumulated about $120 billion in reserves in 2003 and appear to have continued that rate of intervention since.
2001-11-30	US Federal Reserve System	This point brings us to the question: How does a currency become an international currency? The question is particularly intriguing because, in the reign of fiat currencies, its answer is unlike the explanation of how a currency becomes dominant within a country.
2011-06-07	US Federal Reserve System	In fact, we recognize that the United States, as the issuer of the global reserve currency, has singular responsibilities within the global system. The central role of the dollar and dollar assets rests on several pillars: ...
2005-03-02	US Federal Reserve System	... to keep their own currencies strong, they would run out of the foreign assets to sell to support their own currency. But in keeping the dollar strong, all central banks have to do is to create reserves, and central banks can create reserves.
2017-12-20	US Federal Reserve System	In doing so, we also recognize the individuals past and present who have played a role, often behind the scenes, in managing the Federal Reserve's dollar account operations for the global official sector.
2010-01-19	European Central Bank	I am convinced that the US authorities — both the central bank and the Treasury — consider that a strong dollar vis-a-vis the other major floating currencies is in the interests of the United States. Ben Bernanke and Tim Geithner have made this very clear.
2019-09-17	European Central Bank	The general consensus, however, is that other currencies continue to face considerable obstacles to displacing the US dollar in the international monetary and financial system, and that the broad contours of the system can be expected to remain unchanged in the near term.
2008-07-11	European Central Bank	I have said publicly that it is very important in my eyes that the President of the United States, the Secretary of the Treasury and the Chairman of the Federal Reserve have said that a strong dollar is in the interest of the United States of America.
2010-01-19	European Central Bank	When the financial crisis intensified in 2008, the ECB and the Federal Reserve cooperated closely, together with other central banks, including through swap agreements. We ourselves supplied US dollars on this side of the Atlantic as part of this very close cooperation.
2015-10-02	European Central Bank	Chitu, L., B. Eichengreen and A. Mehl (2014), "When did the dollar overtake sterling as the leading international currency? Evidence from the bond markets", Journal of Development Economics 111, pp. 225-245.
2003-11-03	Bank of Greece	Today, many historians blame the gold standard for helping precipitate the Great Depression that began in 1929. Regardless, the global stock market crash of 1929 and the ensuing global financial crisis of September 1931 saw many countries driven off the gold standard.
2008-07-01	Bank of Italy	On the foreign exchange front, the dollar, in spite of its present weakness, remains the currency of the world's largest economy, with deep, open and liquid financial markets and a central bank with a firmly established reputation for independence.
2017-06-16	The Bank of Spain	The system to which the Bretton Woods agreements gave birth replaced gold with the US dollar, insofar as exchange rates were fixed in relation to the dollar rather than to gold, although an indirect link to gold was maintained through the dollar/gold parity.
2019-09-10	Deutsche Bundesbank	Universally accepted currencies are not a new phenomenon: be it gold during the gold standard, the pound sterling during the Industrial Revolution or the US dollar to this day, all have served as major internationally accepted units of account.
2008-05-30	Sveriges Riksbank	Another factor that has certainly been significant is the depreciation of the dollar. Commodities are priced in dollars, and this may mean that commodities exporters will try to gain compensation through higher prices if the dollar falls.

Notes: The table provides examples of statements with a high classification score for the `united_states_dollar` feature.

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