MASTER IN INTERNATIONAL FINANCE

Research Paper

Academic Year 2025-2026

When Words Move Markets: Forward Guidance and the Power of Federal Reserve Communication.

Célia Chopelin & Emma Dufaure[1]

Under the supervision of Professor Irina Zviadadze

President of the Jury: Professor Alina ROSU

Submission date: 07/05/2026

Keywords: Forward Guidance, Federal Reserve communication, Monetary policy shocks, Qualitative policy communication, Quantitative policy communication, Financial Market Reactions

☒ PUBLIC REPORT ☐ CONFIDENTIAL REPORT

Disclaimer Regarding the Use of Large Language Models: We acknowledge the use of large language models as tools to support the research process, improve formatting, structure the regression code and enhance grammatical clarity in this paper. The intellectual content, arguments, and findings in this paper are those of the authors, except where specific citations and quotes are provided.

[1] Célia Chopelin, +33648089920, celia.chopelin@hec.edu, 1 rue de la Libération, 78350 Jouy-en-Josas, France
Emma Dufaure, +33651018443, emma.dufaure@hec.edu , 1 rue de la Libération, 78350 Jouy-en Josas, France

Abstract

This thesis examines how Federal Reserve forward guidance affects financial markets between 2008 and 2018 using a high-frequency event-study framework based on Swanson's (2021) research. Monetary policy surprises are decomposed into three factors namely current rate surprises (MP1), forward guidance shocks (MP2), and large-scale asset purchase shocks (LSAPs). Results show that forward guidance has economically significant effects, particularly on exchange rates and equity prices, these effects are strongest on announcement dates but less persistent over time.

Acknowledgements

We would like to express our sincere gratitude to Professor Irina Zviadadze for her support, guidance and valuable feedback throughout the entire development of this thesis. Her advice helped us not only refine our research question but also strengthen our empirical approach and deepen our understanding of the effects of conventional and unconventional monetary policy. We are also grateful to HEC Paris, and more specifically the Master in International Finance program, for giving us access to the resources, knowledge and discipline to write this research paper.

- Célia Chopelin & Emma Dufaure

Table of Contents

1. Introduction: 4

2. Literature Review: 8

3. Data and Methodology: 11

3.1. Choice of independent variables 11

3.2. Choice of dependent variables 11

3.3. Sample and data 12

3.4. Construction of monetary policy shocks 14

3. 5. Econometric approach 15

3.6. Qualitative versus quantitative announcements 16

3.7. Dynamic effects 17

4. Empirical Analysis 18

4.1. The effects of forward guidance on asset prices 18

4.1.a. Stock Prices 18

4.1.b Exchange Rates 19

4.1.c. Broad Dollar Index Response 20

4.1.d. Overall Findings – Full sample 20

4.2. Forward Guidance Across Economic Regimes 21

4.3. Qualitative versus Quantitative Monetary Policy Announcements 24

4.4. The Persistence of Forward Guidance Effects 27

5. Conclusions: 29

6. Tables and Figures 31

6.1 Tables 31

6.2 Figures 41

7. Bibliography 43

1. Introduction:

After the Global Financial Crisis, the Federal Reserve's Open Market Committee (FOMC) had lowered the federal fund rate to its effective lower bound, making this traditional monetary policy inefficient. As the economic conditions continued to deteriorate, the Federal Reserve (FED) started to rely increasingly on unconventional monetary policies to stimulate the economy (Campbell et al., 2019).

In the following years, the FED announced its intention to keep future policy rates exceptionally low, and such communication, known as forward guidance, began having a key role influencing financial conditions through expectations about future rates.

More precisely, forward guidance involves a central bank issuing public statements concerning the likely future path of its policy instruments, to shape expectations far enough into the future to affect the longer-term interest rates that matter for investment and spending decisions (Nelson, 2021).

A notable example is the FED's adoption of date-based guidance in August 2011, when the FOMC stated that exceptionally low levels for the federal funds rate were likely to be warranted "at least through mid-2013." This episode is widely regarded as a successful use of forward guidance because it lowered market interest rates by shifting expectations about future policy (Crump, Eusepi and Moench, 2013).

This thesis studies whether forward guidance effectively influences financial markets, whether its effects vary across economic environments, whether the type of announcement matters, and whether these effects persist beyond the immediate announcement window.

These questions are important because modern monetary policy increasingly operates not only through current rate changes, but also through communication and balance-sheet policies.

Understanding which component of policy communication matters most is therefore essential for evaluating the transmission of monetary policy in both normal times and crisis periods. The thesis builds directly on the identification strategy used by Swanson (2021), "*Measuring the Effects of Federal Reserve Forward Guidance and Asset Purchases on Financial Markets*.". We replicated Swanson's methodology, employing an event-study framework using high-frequency changes in federal funds futures around FOMC announcements to isolate exogenous monetary policy surprises.

The focus on FOMC announcements is particularly useful because these events occur at well-defined and pre-announced dates. The Federal Open Market Committee holds eight regularly scheduled meetings per year, roughly one every six weeks, and may also hold unscheduled meetings when economic conditions require a more immediate policy response. At the end of each scheduled meeting, the Committee releases a policy statement summarizing its decision and its assessment of the economic outlook. Because these announcements are closely followed by financial markets and released at a precise time, they provide a natural setting in which to measure how asset prices respond to unexpected monetary policy news.

Following Swanson's framework, monetary policy surprises are decomposed into three factors, MP1 which captures unexpected cuts or rises in the current federal funds rate target, MP2 which captures unexpected signals that rates will stay higher or lower in the future. It does not mean that the FED will change rates today, but instead changes markets expectations about future rates, which we interpret as forward guidance. Lastly, Large-Scale Asset Purchases (LSAPs) reflect unexpected changes in large-scale asset purchases. Those three factors will be explained in more detail later in this research.

Under Swanson's identification strategy, LSAP shocks represent movements in longer-term Treasury yields that cannot be explained by contemporaneous changes in the federal funds rate or by forward guidance. Under the expectations hypothesis of the term structure, long-term interest rates and asset prices reflect anticipated future short-term rates. Consequently, if forward guidance credibly shifts expectations about the future policy path, financial markets should respond immediately, even in the absence of a change in the federal funds rate.

The empirical analysis focuses on the S&P 500, the EUR/USD exchange rate, the USD/JPY exchange rate, and the dollar index. These assets are chosen because they capture different dimensions of financial market adjustment. The S&P 500 captures the response of equity markets and reflects changes in expected corporate earnings, discount rates, and overall risk sentiment. The EUR/USD exchange rate measures the external value of the dollar against the currency of another major advanced economy, allowing us to assess the international spillovers of U.S. monetary policy. The USD/JPY exchange rate is also especially informative, as the yen is widely regarded as a safe-haven currency and often reacts strongly to shifts in global risk conditions and unconventional monetary policy, and the DXY captures the dollar's performance against a wider basket of major trading partners. Taken together,

these assets provide a broad picture of how monetary policy affects both domestic financial conditions and international currency markets.

The thesis makes two extensions to Swanson's analysis. First, it examines whether the effects of monetary policy shocks vary across economic environments by comparing the full sample with the Covid crisis period as well as the 2008 financial crisis.

Second, it distinguishes between qualitative communication-driven announcements and quantitative policy events related to balance-sheet actions. This distinction makes it possible to examine whether financial markets react differently to central bank communication that primarily shapes expectations, as opposed to policy announcements involving direct quantitative intervention.

The results show that the effects of monetary policy announcements are both state-dependent and communication-dependent. In the full sample and in qualitative announcements, forward guidance has clear and statistically significant effects on several asset prices, especially in foreign exchange markets. During crisis periods, however, LSAP shocks became more important, suggesting that unconventional policy become increasingly effective in those periods.

Moreover, the comparison between qualitative and quantitative announcements also indicates that the effectiveness of FOMC announcements depends not only on the monetary shock itself, but also on the form of communication. Indeed, according to our results, communication seems to be more powerful when it is qualitative, and expectation driven.

Finally, the thesis analyses the persistence of forward guidance effects by estimating local projection regressions across multiple horizons to assess whether the impact of forward guidance shocks extends beyond the immediate announcement window and continues to influence Treasury yields over subsequent FOMC meetings.

The existing literature shows that forward guidance can influence financial markets, particularly through revisions to the expected path of policy rates. However, three issues remain open to further investigation: the relative importance of contemporaneous rate surprises and forward guidance across macroeconomic environments, the role of announcement type, and the persistence of forward guidance effects across subsamples. By adopting Swanson's identification strategy while extending the analysis across different

policy contexts and communication formats, this thesis contributes to a better understanding of when, how, and through which channels forward guidance affects financial markets.

2. Literature Review:

Forward guidance works through the expectations channel of monetary policy transmission. Under the expectations hypothesis of the term structure (Shiller, 1978; Campbell & Shiller, 1991), long-term interest rates reflect the expected path of future short-term rates. When central banks credibly signal future policy intentions, financial markets adjust by revising expectations of future rates. At the effective lower bound (ELB), where conventional rate cuts are strained, this communication channel becomes particularly important (Eggertsson & Woodford, 2003). The literature separates Odyssean forward guidance, which commits the central bank to a future policy path, and Delphic forward guidance, which only provides information about the central bank's economic outlook (Campbell et al., 2012). Odyssean guidance operates through commitment and time-consistency mechanisms, while Delphic guidance primarily transmits information about future fundamentals. Empirically separating these effects remains challenging, as both can influence market expectations simultaneously.

A key empirical challenge is identifying exogenous monetary policy shocks. Traditional macroeconomic approaches relying on monthly data often confound policy decisions with economic fundamentals. To address this, the literature increasingly relies on high-frequency identification methods around policy announcement windows. Kuttner (2001) pioneered the use of federal funds futures to extract unexpected changes in monetary policy. Gürkaynak, Sack, and Swanson (2005) extended this framework by decomposing policy surprises into multiple factors, including a "path factor" capturing revisions to the expected future rate path. Their findings show that long-term yields respond strongly to forward-looking components of policy communication, often more than to contemporaneous rate changes. Swanson (2021) further refines this identification strategy by separating conventional rate surprises, forward guidance, and asset purchase shocks using high-frequency financial data. He demonstrates that forward guidance has economically large effects on financial markets, particularly at the ELB, and that its impact differs from that of large-scale asset purchases (LSAPs). Our thesis builds directly on this literature by adopting Swanson's event-study framework using the three factors structure: a contemporaneous rate surprise (MP1), a forward guidance component (MP2) and lastly a surprise changes in large-scale asset purchase policies (LSAP).

Empirical evidence generally supports the view that forward guidance affects financial markets. Gürkaynak et al. (2005) show that revisions to the expected path of policy rates

explain movements in longer-term Treasury yields. Campbell et al. (2012) find that forward guidance affects both real yields and risk premium, although its informational content can make the interpretation of these effects more complex. Forward guidance also appears to be especially powerful when policy rates are constrained by the effective lower bound.

Swanson and Williams (2014) show that long-term yields continue to respond to macroeconomic news even when short-term interest rates are constrained, suggesting that forward guidance remains an effective transmission channel for monetary policy. In a similar way, Hanson and Stein (2015) find that communication about the future path of policy rates can significantly influence asset prices through duration-risk channels.

However, some studies suggest that forward guidance may lose effectiveness in certain contexts. Andrade et al. (2019) find that overly persistent guidance may reduce credibility if it conflicts with economic fundamentals. The impact of guidance may therefore depend on several factors such as economic conditions, credibility, or market expectations. During periods of extreme uncertainty or financial stress, markets may respond differently to policy signals. Bauer & Neely, (2014) shows that during crisis periods, investors may priorities observable and immediate policy actions over conditional communication.

The COVID-19 crisis provides a natural example in this regard. Research suggests that during early 2020, markets reacted strongly to conventional rate cuts and liquidity interventions (Faria-e-Castro, 2021), while the relative effectiveness of forward guidance remains debated. This raises the possibility that communication may play a secondary role during acute crises but regain importance in more stable environments. By comparing full-sample results with COVID subsamples, our thesis contributes to this state-dependent perspective. In addition, the literature considers whether the format of forward guidance affects its impact. Some central banks publish clear and explicit projected rate paths (e.g., Sweden, Norway, New Zealand), while others rely more on qualitative or state-contingent language (Federal Reserve, ECB). Research suggests that explicit numerical guidance may enhance transparency but can also reduce flexibility (Nelson, 2024). In the U.S. context, Federal Reserve guidance has evolved from calendar-based language (“rates will remain low until mid-2015”) to state-contingent and reaction-function-based communication. Markets appear to respond primarily to revisions in the expected future path rather than to contemporaneous rate changes (Gürkaynak et al., 200; Swanson, 2021). However, the relative sensitivity of equities versus exchange rates

remains less explored, particularly across qualitative versus quantitative policy events. Our subsample analysis contributes to this debate by distinguishing communication-driven announcements from quantitative balance-sheet measures. Finally, an important question concerns persistence and whether forward guidance shifts expectations about future rates or if its effect restrained to the announcement window. Swanson (2021) documents persistent downward shifts in Treasury yields following major forward guidance announcements, notably in March 2009. Such findings support the interpretation that forward guidance alters the expected policy path rather than generating temporary price movements.

3. Data and Methodology:

This thesis examines the effects of U.S. monetary policy announcements on major financial markets using a high-frequency event-study framework. After having identified the unexpected monetary policy shocks around Federal Open Market Committee (FOMC) announcements, this paper aims to estimate their impact on different asset classes, variables that we will define later in this chapter. The choice of using high-frequency event studies is particularly important in this research as this method enables us to reduce the likelihood that observed asset price movements are driven by unrelated macroeconomic or financial news. By using very narrow windows around policy announcements, changes in market prices can be interpreted as responses to the monetary policy surprise component of the announcement rather than to the announcement itself, which can be partly anticipated by market participants.

3.1. Choice of independent variables

Our main variables of interest are three monetary policy factors, respectively denoted MP1, MP2, and LSAP, which capture distinct dimensions of central bank announcements.

Following the approach used by Eric T. Swanson (2021), we decompose monetary policy surprises into multiple components rather than relying on a single indicator. MP1 represents the surprise change in federal funds rate target for current FOMC meeting, implied by fed funds futures. MP2 captures the change in expected funds rate target for next scheduled FOMC meeting, as implied by fed funds futures. Finally, LSAP reflects unconventional monetary policy corresponding to the purchases by the Federal Reserve of hundreds of billions of dollars of longer-term U.S. Treasury bonds and mortgage-backed securities. These variables are derived using a factor-based approach applied to high-frequency asset price changes around policy announcements, allowing us to isolate the unexpected component of each policy dimension.

3.2. Choice of dependent variables

The analysis focuses on four financial variables: the S&P 500, the EUR/USD exchange rate, the USD/JPY exchange rate and the DXY.

The S&P 500 is used as a broad measure of U.S. equity market reactions. Monetary policy announcements can affect equity prices through different mechanisms, including changes in discount rates, revisions to expected future earnings, and shifts in overall risk sentiment. As a

benchmark U.S. stock market index, the S&P 500 provides a natural indicator of how monetary policy influences domestic financial conditions.

The EUR/USD exchange rate is included to measure the international transmission of U.S. monetary policy relative to another major advanced economy. Because the euro area represents one of the largest monetary jurisdictions outside the United States, movements in the dollar against the euro provide useful evidence on how U.S. policy shocks affect exchange rate expectations and cross-border capital flows.

Furthermore, the USD/JPY exchange rate is also particularly informative because the Japanese yen is widely regarded as a safe-haven currency. It often responds strongly to changes in global uncertainty, risk appetite, and unconventional monetary policy measures. Including both USD/EUR and USD/JPY therefore makes it possible to assess whether exchange-rate responses differ depending on the international role and risk characteristics of the counter-currency.

Finally, the inclusion of DXY complements the bilateral exchange rates. While EUR/USD and USD/JPY show how the dollar moves against two specific currencies, DXY captures the dollar's performance against a wider basket of major trading partners. This makes it a more general indicator of the international transmission of U.S. monetary policy.

Taken together, these four assets allow the analysis to capture both domestic and international dimensions of monetary policy transmission, while also reflecting different forms of market adjustment across equities and foreign exchange.

3.3. Sample and data

The empirical analysis uses a sample of FOMC announcements over the period in which forward guidance and unconventional monetary policy became central to the Federal Reserve's policy framework, from 2008 to 2018. This period is relevant because it covers the years during which the federal funds rate was constrained by the effective lower bound and the Federal Reserve relied increasingly on communication and balance-sheet tools. In the second part of our analysis, we also later use data from the covid period (2020-2022) to compare our results across different economic environments. This is made possible as the database used previously by Swanson (2021) is continuously updated, therefore allowing us to have data over the COVID-19 pandemic.

To measure high-frequency changes in interest rates and asset prices around FOMC communication events, this study uses the U.S. Monetary Policy Event-Study Database (USMPD). The USMPD is a public and regularly updated dataset constructed using a transparent methodology described in Acosta et al. (2025). This database contains high-frequency interest rate changes and asset returns over different windows around FOMC communication events.

Figures 1, 2 and 3 plot the three dimensions of monetary policy namely surprise target (MP1), path (MP2), and balance sheet (LSAP) across 92 FOMC announcements between 2008 and 2018, separated by whether the accompanying forward guidance was qualitative (72 meetings, orange) or quantitative (20 meetings, green). It can be seen that monetary policy shocks were particularly volatile in 2008, reflecting the exceptional uncertainty surrounding the Global Financial Crisis. Overall, MP1 shocks remain relatively close to zero across the sample, suggesting that target-rate surprises were generally limited after the initial crisis period. By contrast, MP2 and LSAP shocks display greater dispersion, indicating that announcements affecting the expected future path of interest rates and asset purchase programs had a stronger and more variable market impact. Visually, the figures therefore highlight an important difference between the three dimensions of monetary policy: forward-guidance and balance-sheet-related shocks that generated larger market reactions than conventional monetary policy.

For our research, we have decided to use the “statement” window which is a 30-minute window from 10 minutes before to 20 minutes after the release of the FOMC statement. Following the literature initiated by Kuttner (2001) and extended by Gürkaynak, Sack, and Swanson (2005), futures prices are used because they provide a market-based measure of policy expectations immediately before and after the announcement. The surprise component of policy is therefore identified as the change in these market expectations within the event window.

The dependent variables are the corresponding high-frequency changes in the selected asset prices over the same 30-minute announcement window. For equities, the dependent variable is 100 times the change in the logarithm of the S&P 500 index. For exchange rates, the dependent variables are 100 times the log changes in the dollar-euro and dollar-yen exchange rates. Using log changes scaled by 100 ensures that coefficients can be interpreted directly as percentage point responses per standard deviation change in each monetary policy instrument.

3.4. Construction of monetary policy shocks

While the independent variable MP1, MP2, and LSAP were previously defined in our data section, we believe it is important to explain how these shocks are constructed. This paper follows the same methodology as Swanson (2021) which is to apply a high-frequency factor-based approach to changes in interest rate instruments around FOMC announcements.

More precisely, we collect high-frequency changes in a set of financial variables, including federal funds futures, Eurodollar futures, and Treasury yields across maturities within the event windows for each FOMC announcement. These changes are organized into a data matrix X, where each row represents an announcement and each column corresponds to a specific financial instrument.

Following Swanson (2021), we assume that these price movements are not independent across instruments but are jointly driven by a small number of common underlying policy shocks.

The author came to this conclusion by observing that interest rates of different maturities tend to move together in response to FOMC announcements.

He therefore models the data as follows:

$$X=F\Lambda+\varepsilon$$

where F represents the latent monetary policy factors, Λ is a matrix of factor loadings, and ε is an error term.

The number of underlying factors is determined empirically using the rank test of Cragg and Donald (1997), which tests the hypotheses that the observed variation in asset prices can be explained by a given number of common factors or if more needs to be added. Consistent with Swanson (2021)'s findings, we find that $k = 3$ factors are needed, as the hypotheses of zero, one, and two factors are all significantly rejected, while the hypothesis of three factors cannot be rejected (***Table 1***).

While the three factors are initially estimated as the first three principal components of X, principal components are purely statistical and do not have a direct economic interpretation. Since any orthogonal rotation of these three components produces an alternative factor model that fits the data equally well, an additional step is required to assign meaningful economic content to each factor.

This step consists of selecting a specific rotation of the principal components such that each factor corresponds to a specific type of monetary policy shock, namely a surprise change in the federal funds rate, a forward guidance surprise, and an asset purchase surprise. Since the rotation involves three factors, three identifying restrictions are required to uniquely determine them.

They are defined as follows:

First, forward guidance shocks (MP2) are assumed not to affect the current federal funds rate which reflects the idea that forward guidance only changes expectations about future policy.

Second, LSAP shocks are also assumed not to affect the current federal funds rate, reflecting the fact that large-scale asset purchases operate primarily through long-term interest rates and not through the policy rate itself.

Third, the LSAP factor is constrained to be negligible in the pre-crisis period (1991–2008), when large-scale asset purchases were not yet implemented by the Federal Reserve. Although our empirical analysis focuses on the post-2008 period, this restriction remains important as it is used in Swanson (2021) paper to distinguish unconventional monetary policy shocks from other policy announcements.

Rather than re-estimating these factors ourselves, we directly use the monetary policy shocks constructed by Swanson (2021), which already incorporate this identification procedure. This ensures consistency with the original methodology and improves comparability with existing results.

3. 5. Econometric approach

After obtaining the three monetary policy factors, we measure the impact of monetary policy shocks on financial markets, using a standard ordinary least squares (OLS) regression.

For each dependent variable, we estimate the following regression:

$$\Delta Y_t = \alpha + \beta_1 MP1_t + \beta_2 MP2_t + \beta_3 LSAP_t + \varepsilon_t$$

where ΔY_t denotes the high-frequency change in the asset price Y. More it corresponds to 100 times the log change in the S&P 500, EUR/USD, USD/JPY, or DXY, measured over the same 30-minute window as the policy factors, for each FOMC announcement t. MP1t, MP2t,

and LSAPt on the other hand, represent the three monetary policy shocks.

Furthermore, the coefficients β1, β2, and β3 measure the average effect of a one-standard-deviation surprise in each policy instrument on the asset price, expressed in percentage points.

Because the explanatory variables are constructed as unexpected changes in policy expectations, and the dependent variables are measured over a very narrow event window, we believe that the estimated coefficients can be interpreted as causal effects of monetary policy shocks on asset prices.

3.6. Qualitative versus quantitative announcements

Beyond the baseline specification, the thesis also distinguishes between different types of FOMC communication. In particular, the sample is divided into qualitative communication-driven announcements and quantitative policy events related to balance-sheet actions[2]. The purpose of this distinction is to test whether financial markets respond differently to central bank communication that primarily shapes expectations and to announcements that involve concrete policy implementation.

Qualitative announcements include statements in which the central bank provides guidance about the future path of policy, the economic outlook, or the likely stance of future decisions without necessarily announcing a direct balance-sheet intervention. Quantitative announcements, by contrast, refer to events involving asset purchases or other measures that alter the size or composition of the central bank's balance sheet.

This distinction is important because the effectiveness of forward guidance may depend on the broader policy environment. Communication may be especially powerful in periods in which markets are attentive to central bank signaling, whereas quantitative interventions may dominate when policy rates are constrained and central banks rely more heavily on direct

[2] The classification of FOMC announcements into qualitative and quantitative policy events was conducted manually using the official meeting statements and transcripts available on the Federal Reserve website (Board of Governors of the Federal Reserve System, n.d.). Each announcement was reviewed individually to determine whether the policy action primarily reflected communication about the future policy path (qualitative forward guidance) or balance-sheet-related measures such as asset purchases (quantitative policy). The documents were obtained from the Federal Reserve's historical archive of FOMC materials (**Table 2**).

market operations.

To understand how we made this distinction, Table 2 illustrates how we classified several FED statements, randomly chosen over the 2008-2018 period.

3.7. Dynamic effects

Finally, the thesis investigates whether the effects of forward guidance persist beyond the immediate event window. If forward guidance genuinely changes market expectations about the future path of interest rates, then its impact should not vanish immediately after the announcement. To explore this issue, the analysis extends beyond the contemporaneous event-study regression and examines the dynamic response of asset prices following policy announcements, following the logic of Swanson (2021). This makes it possible to assess whether forward guidance has only a temporary announcement effect or whether it generates more persistent adjustments in financial markets.

4. Empirical Analysis

4.1. The effects of forward guidance on asset prices

After gathering the data on the federal fund rate, forward guidance and LSAP component for each FOMC announcement from 2008 to 2018, we estimate the effect of these policies on a variety of asset prices using, like Swanson (2021), high frequency regressions, described earlier in the empirical strategy.

Table 3 reports the estimated effects of the three monetary policy shocks, MP1 (current federal funds rate surprises), MP2 (forward guidance shocks), and LSAPs, on equity and exchange-rate market. Overall, these results show that forward guidance plays a central role in the transmission of monetary policy, with MP2 significant across all assets and often larger in magnitude than MP1. To ensure that coefficients can be interpreted directly as percentage point responses per standards deviation change in each monetary policy instrument, we use log changes scaled by 100.

4.1.a. Stock Prices

The full-sample estimates establish our baseline and reveal a clear and theoretically coherent pattern. Regarding the S&P500, the coefficient on MP1 is +0.290, which is statistically significant and economically meaningful. This positive sign is counterintuitive at first glance, as one might expect that an unexpected rate increase (a tightening surprise) should depress equity prices through a higher discount rate on future earnings. However, in the post crisis period, a surprise rate increase can also be interpreted as a signal that the FED perceives the economy as strong enough to support tighter financial conditions, which markets may read as a positive signal about economic fundamentals. This could lead to the standard discount rate channel to be dominated by the information content of the policy surprise as discussed in Nakamura and Steinsson (2018). The coefficient on MP2 is significantly larger in absolute terms, and significant at the 1% level. Indeed, a one-standard-deviation tightening of forward guidance causes stocks to fall by around 0.37%. This reflects the standard asset-pricing chain: higher expected future rates imply a higher discount rate applied to future corporate cash flows, which compresses equity valuations. The larger magnitude of MP2 relative to MP1 is a central finding of our analysis: markets appear more sensitive to revisions in the *expected path of rates* than to immediate target surprises. This is consistent with the theoretical prediction that long-duration assets are particularly exposed to changes in the entire expected

rate trajectory, not just the current setting. LSAP shocks also have a negative and significant effect on equities of -0.172, suggesting that balance-sheet policy matters but is less influential than policy-path communication in the market.

4.1.b Exchange Rates

Turning to exchange rates, the EUR/USD response to MP1 is not statistically significant at the 5% level, suggesting that the current meeting rate surprise has limited explanatory power for the euro-dollar rate over the full sample. By contrast, MP2 generates a coefficient of -0.250, significant at the 1% level. This negative coefficient implies that an unexpected tightening in forward guidance is associated with an appreciation of the dollar against the euro. This result is consistent with standard exchange-rate theory, particularly uncovered interest parity, since a hawkish forward-guidance surprise raises expected future U.S. interest rates relative to euro-area rates. As dollar-denominated assets become more attractive, capital flows toward the dollar, increasing demand for the U.S. currency and causing EUR/USD to fall. In other words, fewer dollars are required to buy one euro, which corresponds to a stronger dollar. Regarding LSAPs, the coefficient is again highly significant, and equal to -0.274. This indicates that balance-sheet surprises also had an important effect on the EUR/USD exchange rate. The negative sign suggests that an unexpected increase in the LSAP factor is associated with a fall of the EUR/USD, meaning a depreciation of the dollar against the euro. This result seems logical as asset purchases should lower US yields and weaken the dollar.

For USD/JPY, all three monetary policy factors are statistically significant at the 1% level, showing that this exchange rate is particularly sensitive to U.S. monetary policy surprises. The coefficients on MP1 and MP2 are -0.217 and -0.268 respectively, while the coefficient on LSAPs is 0.309. The fact that all three shocks matter suggests that the yen-dollar exchange rate is responsive not only to policy-rate expectations but also to liquidity and balance-sheet conditions. This is plausible given the international role of the yen and its frequent safe-haven status in global markets: during much of our 2008–2018 sample, unexpected U.S. rate tightening could trigger risk-off dynamics and yen appreciation, while hawkish forward guidance might have different safe-haven implications depending on the risk environment. Compared with EUR/USD, USD/JPY appears more broadly sensitive to all dimensions of U.S. monetary policy, which may reflect the stronger interaction between U.S. monetary conditions, global risk sentiment, and Japanese financial markets.

4.1.c. Broad Dollar Index Response

The results for DXY, the U.S. dollar index, follows this broader interpretation. MP1 is significant but smaller in magnitude (-0.125) than MP2 (0.241) and LSAPs (0.265), both of which are highly significant. This again suggests that the broad external value of the dollar reacts more strongly to forward guidance and balance-sheet policy than to current rate surprises. The inclusion of DXY is particularly useful because it provides a broader measure of dollar strength than bilateral exchange rates alone. While EUR/USD and USD/JPY may reflect currency-specific influences, DXY captures the dollar's value against a basket of major currencies and therefore helps confirm that the effects identified are not driven solely by idiosyncratic developments in the euro area or Japan. In this sense, DXY serves both as a measure of international monetary transmission and as a robustness check for the bilateral exchange-rate results.

4.1.d. Overall Findings – Full sample

Taken together, these findings strongly support the conclusion that forward guidance affects financial markets in a powerful way. MP2 is statistically significant in all markets, and in all cases its coefficient is larger than that of MP1, especially for the S&P 500 and the exchange rates. This indicates that markets care more about the future path of policy than about the current rate decision alone. The results also show that LSAP shocks are highly relevant, particularly in foreign exchange markets, confirming that unconventional balance-sheet policies played an important role in the transmission of monetary policy over the sample period.

The explanatory power of the regressions is also notable as the R^2 values range from 0.28 for the S&P 500 to 0.72 for USD/JPY, with 0.49 for EUR/USD and 0.54 for DXY. These results suggest that monetary policy surprises explain a substantial share of the variation in high-frequency asset price movements within the narrow window surrounding FOMC announcements.

Moreover, we decided to perform the same analysis but using a different sample as a robustness check, visible in **Table 11**. We used the "Monetary Events" sample, which is composed of a 100-minute window from 10 minutes before the statement was released to 60 minutes after the beginning of the press conference. The result of our analysis allows us to confirm our previous findings that forward guidance do have an impact on the financial market

(**Table 11**).

4.2. Forward Guidance Across Economic Regimes

The COVID-19 sub-sample produces the most striking results in our analysis and reveals a fundamentally different monetary policy transmission mechanism operating during crisis. The contrast with the full-sample estimates is significant and warrants careful interpretation.

During the pandemic, financial markets were characterized by high uncertainty, sharp volatility, and an exceptional demand for liquidity and safe assets. At the same time, the FED operated under the constraints of the effective lower bound, which limited the scope for conventional interest-rate policy and increased the importance of forward guidance and large-scale asset purchases. Studying this subsample therefore allows us to test whether the effects of monetary policy shocks are state-dependent, that is, whether markets respond differently in periods of crisis than in more stable conditions. It helps assess whether investors place greater weight on concrete policy interventions such as LSAPs during episodes of severe stress, while communication about the future path of rates may play a different role than in normal periods.

Table 4 presents the estimated effects of monetary policy shocks during the COVID subsample. Compared with the full-sample results, the crisis period reveals a clear change in the transmission of monetary policy across asset classes, pointing to strong state dependence in financial market reactions.

For the S&P 500, both MP1 and MP2 are large, statistically significant at the 1% level, and economically meaningful, but with opposite signs. The coefficient on MP1 is 2.784, which, compared to the result of the full sample regressions, reflects the important responsiveness of equity markets to current rate surprises during the pandemic. Indeed, this positive effect is unusual compared to “normal” times and shows that in times of crisis, changes in federal fund rate may have been interpreted as signals of policy support and stabilization. The R^2 of 0.79, compared with 0.28 in the full sample is particularly useful: MP1 alone explains almost 80% of the variations in S&P 500 returns around FOMC announcements during the COVID-19 period, which confirms that conventional monetary policy actions where the dominant driver of equity market dynamics at this time. The MP2 coefficient also has a stronger magnitude as the full sample but is negative (-2.348). This is interesting as it shows that MP1 and MP2 pull in opposite directions in times of crisis for equities: an unexpected rate cut (negative MP1)

boosts equities, while a conservative revision in forward guidance (negative MP2) is also associated with equity declines. This can be explained through the “bad news” channel of forward guidance as defined Andrade et al. (2019). During COVID, the FED expected to keep rates lower for longer, it signalled to markets that the Central Bank was pessimistic about the economic growth, making markets more uncertain. This is consistent with the findings of Nakamura and Steinsson (2018), that the information effect of monetary policy can reverse the sign of conventional policy in crisis environments. LSAP shocks, however, are not statistically significant for equities once MP1 and MP2 are included. This suggests that, during COVID, equity markets reacted more strongly to interest-rate and policy-path information than to balance-sheet expansions.

For EUR/USD, the results show that MP1 is not statistically significant, while MP2 is weakly negative and significant at conventional levels, with a coefficient of -0.146. This implies that tighter forward guidance led to a decline in EUR/USD, that is, an appreciation of the dollar against the euro. Here, the strongest result comes from LSAP shocks, which are highly significant and strongly negative, with a coefficient of -0.242. This indicates that LSAP-related surprises generated dollar appreciation relative to the euro during the pandemic. This confirms an important asymmetry: forward guidance was nearly irrelevant for FX pricing during the COVID crisis, even as it was crucial for equity markets. This finding is consistent with the interpretation that currency markets responded primarily to the observable, immediate policy actions of the Fed (the rate cuts themselves) rather than to the Fed's communication about future rate paths. This may reflect increased uncertainty about the economic outlook making forward-looking rate expectations harder to price, or it may reflect the dominance of safe-haven and liquidity flows in FX markets during acute stress periods.

For USD/JPY, the pattern is even more striking. Neither MP1 nor MP2 are statistically significant, with coefficients of 0.140 and 0.032 respectively. In contrast, LSAP shocks are positive and highly significant, with a coefficient of 0.188. This indicates that balance-sheet policy was the main channel through which U.S. monetary policy affected the dollar-yen exchange rate during COVID. Given the yen’s role as a safe-haven currency, this result is consistent with the idea that large-scale asset purchases influenced global portfolio allocation, liquidity conditions, and safe-haven flows in ways that strengthened the dollar relative to the yen.

The results for DXY, the broad dollar index, confirm this interpretation. MP1 is positive and weakly significant, with a coefficient of 0.564, suggesting that conventional rate surprises slightly strengthened the dollar during the crisis. MP2 is not statistically significant, indicating that forward guidance did not have a clear independent effect on the broad dollar index in this period. By contrast, LSAP shocks are positive and highly significant, with a coefficient of 0.258, implying that asset purchase surprises led to broad-based dollar appreciation. This reinforces the idea that, during COVID, balance-sheet policy announcements had powerful effects on global capital flows and international demand for dollar assets.

Taken together, the COVID subsample highlights a marked shift in monetary transmission relative to the full sample. Large-scale asset purchase shocks have become the dominant driver of exchange-rate movements, with strong and highly significant effects on EUR/USD, USD/JPY, and DXY. Forward guidance remains important for equities, where it exerts a large and negative effect, but appears much less influential in foreign exchange markets during the crisis. Meanwhile, conventional rate surprises play a more limited role, especially in currency markets, which is consistent with the fact that the policy rate was constrained by the effective lower bound and that markets were therefore more responsive to unconventional tools.

The explanatory power of the regressions is also substantially higher during the COVID period, with R^2 values of 0.79 for the S&P 500, 0.66 for DXY, 0.78 for EUR/USD, and 0.64 for USD/JPY. For a high-frequency event-study setting, these are very strong values and suggest that monetary policy shocks explain a large share of asset-price variation within announcement windows during the crisis. This reinforces the conclusion that monetary policy communication and unconventional interventions played an amplified role in times of severe economic stress.

However, it is important to underline a methodological caveat: the COVID sub-sample contains only N = 25 observations, which reduces statistical power relative to the full sample, increases the leverage of individual observations (particularly the extraordinary March 2020 meetings), and may contribute to inflated R^2 values through over-fitting dynamics. Nevertheless, the statistical significance of MP1 across all three assets, with very large t-statistics, provides some reassurance that the qualitative conclusions are valid.

Overall, the COVID results reveal strong state dependence in monetary policy transmission: while forward guidance remains central for equity markets, LSAP shocks dominate exchange-

rate adjustments, confirming the increased importance of unconventional policy tools during periods of crisis.

Moreover, in order to strengthen our findings, we decided to perform the same analysis but using another crisis sample, namely the financial crisis of 2008 as shown in **Table 10**. We therefore did the same regression but using a sample from the first January of 2008 until December 2008. Our findings coincide with the one above namely that forward guidance has a significant effect on the SP500 as well as the USD/JPY exchange rate but a less pronounced one for the EUR/USD and DXY (**Table 10**).

4.3. Qualitative versus Quantitative Monetary Policy Announcements

As described in the Data Section, this study extends Swanson's analysis by examining whether the style of communication used in FOMC announcements leads to different financial market responses. More specifically, the analysis distinguishes between qualitative and quantitative announcements. This distinction makes it possible to assess whether markets react differently when the Federal Reserve communicates through broad, qualitative guidance about the future path of policy, as opposed to more quantitative announcements involving explicit numerical commitments or balance-sheet measures. By separating these two types of communication, the paper aims to identify whether the effects of monetary policy shocks depend not only on their content, but also on the way they are communicated to financial markets.

An important observation is that qualitative and quantitative announcements are not randomly mixed over time but instead, they appear in clusters. **Figure 1, Figure 2 and Figure 3** show the evolution of monetary policy surprise shocks associated with forward guidance announcements between 2008 and 2018. The graphs distinguish between qualitative forward guidance announcements (orange points) and quantitative forward guidance announcements (green points). The announcements appear concentrated as we can see from 2012-2013 that most of them are quantitative, and the following ones, from March 2014 to end of 2018, are all qualitative forward guidance announcements.

This could be explained in three ways. First, it depends on the economic context. In crisis or at the lower bound, the FED tends to rely more on quantitative tools and more explicit state-contingent guidance, because conventional policy space is limited.

Second, it may partly reflect the leadership and policy framework of different Fed chairs, but probably less than the macroeconomic environment itself. Bernanke's period (2006-2014) is especially associated with the development of unconventional tools, including LSAPs and more explicit forms of forward guidance, because the post-2008 environment required them.

Third, this pattern matters econometrically because if most qualitative events occur in one set of years and most quantitative events occur in another, then differences in coefficients may capture not only communication style, but also differences in the surrounding macroeconomic regime, market volatility, lower-bound conditions, or crisis intensity. In other words, announcement type is not fully exogenous to the environment. This does not invalidate the analysis, but it means that the comparison should be interpreted carefully: both communication formats and policy regimes are being compared at the same time.

As observed in **Table 5** focusing on the qualitative sample, the coefficients are economically large and mostly highly significant across all asset classes.

For the S&P 500, MP2 and LSAP shocks are both negative and significant, while MP1 is insignificant. This suggests that equity markets do not react much to the immediate policy-rate surprise itself, but they do react strongly when the announcement changes expectations about the future policy path or signals large-scale asset purchases. The coefficients of -0.225 and –0.249 are consistent with the fact that higher expected discount rates and less supportive discount rates lowers equity prices.

The foreign exchange results in the qualitative sample are even stronger. For EUR/USD, all three shocks are negative and significant, meaning that policy surprises tend to strengthen the dollar against the euro. For USD/JPY, MP1 is negative whereas MP2 and LSAPs are positive and highly significant with coefficients of 0,321 and 0,321 respectively. A similar effect is visible for SXY, where MP2 and LSAPs are again positive and highly significant, and even MP1 is significant.

This illustrates that when communication is qualitative, markets seem to revise expectations sharply, and the dollar responds strongly across currencies.

The high R^2 values, especially 0.63 for EUR/USD, 0.81 for USD/JPY and 0.68 for DXY reinforce the idea that these shocks explain a substantial share of the high frequency asset price movements during those events.

By contrast, our results in **Table 6** show that the quantitative sample is much weaker.

For the S&P 500, none of the coefficients is significant, and the R^2 is only 0.03. This needs to be underlined because it suggests that during quantitative-policy episodes, equity prices are not being driven in a systematic way by those surprise components, at least not within our announcement window. This could mean that quantitative measures were not anticipated that their effects were noisier, or that the small sample size of only 20 events reduces statistical power.

Regarding exchange rates in the quantitative sample, the pattern is more selective. EUR/USD reacts significantly only to MP1, with a negative sign, so conventional policy surprises still matter somewhat. USD/JPY reacts significantly to LSAPs and weakly to MP1, while DXY reacts significantly only to MP1. This suggests that in quantitative episodes, the response is narrower and less broad-based than in the qualitative sample. The strongest surviving result is the positive and significant LSAP coefficient for USD/JPY, which may indicate that Japanese markets are particularly sensitive to U.S. balance-sheet shocks.

We can therefore draw the conclusions, according to our results, that communication seems to be more powerful when it is qualitative and expectation driven. Indeed, markets appear to focus on the future path of rates and revise asset prices accordingly in this case. In quantitative policy episodes, by contrast, the role of forward guidance becomes weaker and less systematic, while the effects of unconventional tools such as LSAPs are more isolated and asset specific.

The evidence suggests that the transmission of FOMC announcements depends not only on the monetary policy shock itself, but also on the form of communication. Qualitative announcements generate broader and more statistically robust market responses, whereas quantitative-policy announcements produce weaker and less uniform effects, consistent with the idea that balance-sheet policies operate through different channels than pure communication.

One important caution is that the two samples are very different in size, with $\mathrm{N} = 61$ for qualitative events and only $\mathrm{N} = 20$ for quantitative events. So, part of the weaker significance in the quantitative table may reflect lower power rather than genuinely smaller effects. Still, the contrast is strong enough that the substantive difference looks meaningful, especially given the much lower R^2 values and the lack of significance for equities in the quantitative

subsample.

4.4. The Persistence of Forward Guidance Effects

To analyze the persistence of the effects of the FOMC's monetary policy announcements, we use the local projection method of Jorda (2005). This method estimates how a shock affects an outcome variable over time by running a separate regression for each future horizon h, rather than relying on a single model repeated forward. More precisely, for each horizon, one meeting ahead, two meetings ahead, and so on we directly regress the cumulative change in Treasury yields on the monetary policy surprises MP1 and MP2. More precisely we first estimate a series of horizon h corresponding to the number of meetings ahead, and for each of those horizons we then regress the cumulative change in Treasury yields from just before the FOMC meeting to h meetings later. The regression can be expressed as follows:

$$Y_{t+h} - Y_{t-1} = \alpha_h + \beta_{1,h} MP1_t + \beta_{2,h} MP2_t + \varepsilon_{t,h}$$

where MP1t captures the current policy rate surprise and MP2t represents the forward guidance shock. We decided to add the control variable MP1t in order to avoid omitted variable bias, as changes in the current policy rate are correlated with forward guidance and may otherwise contaminate the estimated effect of MP2t. The coefficient β2,h therefore isolates the true impact of forward guidance on Treasury yields at each horizon.

Figure 4 and Tables 7, 8 and 9 report the full set of local projection estimates across the three Treasury maturities and all horizons from h = 0 to h = 12 FOMC meetings ahead. The result shows that forward guidance shocks have a positive and significant impact on Treasury yields at the time of the announcement, especially for 5 years Treasury (**Table 8**) and 10 years Treasury (**Table 9**), however this effect dissipates almost entirely by h = 1 and remains insignificant at all longer horizons. For the 5 years Treasury, the coefficient at h = 0 is 0.036 and statistically significant at the 5% level (t = 1.99), indicating that a one-standard-deviation forward guidance shock raises 5-year yields by approximately 3.6 basis points on the announcement. **Figure 4** visualizes this dynamic across all three maturities, the impulse response functions peak at h = 0, and cross zero within one to two meetings, confirming that the effect of forward guidance on Treasury yields while present on the announcement date does not persist in a statistically meaningful way beyond the immediate window.

This finding slightly differs from Swanson's one that finds little but significant persistence over time. One explanation for this finding may be the fact that when the Fed gives guidance, the markets instantly and fully incorporate expected future policy paths thus yields adjust on the announcement date not afterward.

4.4.Limitations

Throughout this research, we find a significant relationship between forward guidance and the financial market. However, we believe it would be important to acknowledge some of the limitations to consider when drawing such conclusions.

Firstly, our analysis exclusively focuses on financial market variables (equity prices and exchange rates) leaving open the question of whether forward guidance has the same impact on real macroeconomic outcomes such as employment or inflation. We therefore believe it would be interesting for following research to extend the analysis of other real macroeconomic measures.

Secondly, we need to consider the size of our sample when making conclusions, especially for our analysis of the COVID crisis period (N=25) and the quantitative announcements subsample (N=20), which reduces statistical power and makes cross-sample comparisons less reliable. Additionally, the analysis is restricted to the United States, the findings thus may not generalize to other monetary policy frameworks such as the euro area or Japan. We therefore believe that examining how forward guidance affects financial markets in other jurisdictions would be a truly valuable extension.

Finally, to make the results differentiating qualitative and quantitative forward guidance effectiveness more reliable, future research should focus on how to separate the effects of communication style, but also differences in the surrounding macroeconomic regime, market volatility, lower-bound conditions, or crisis intensity, to make sure that the coefficients reflect only the impact of the communication style.

5. Conclusions:

This thesis evaluates whether the Federal Reserve forward guidance affectively influences financial markets, whether its impact varies across different economic environments, whether the type of announcement matters and whether these effects persist beyond the immediate announcement window. We have extended Swanson's (2021) high frequency identification strategy, using an event-study framework around the FOMC announcements first from 2008 to 2018, to isolate three distinct monetary policy surprises: contemporaneous policy-rate shock, forward guidance shock capturing revisions to the expected path of short rates, and balance-sheet surprises. We also proved that this identification is robust to variations in the assumptions.

We have estimated the effects of the three monetary policy surprises on stock prices, exchange rates and the dollar index. Both forward guidance and LSAPs had significant effects on these assets, and our findings reveal that both unconventional monetary policies were effective, often more effective than conventional ones.

We extended Swanson's (2021) research by comparing these results to a "crisis environment", focusing on the COVID-19 pandemic. Thanks to the continuous update of the USMD database, we were able to use the same method but this time over the 2020-2022 period. We showed that large-scale asset purchase shocks have become the dominant driver of exchange-rate movements, with strong and highly significant effects on EUR/USD, USD/JPY, and DXY. Forward guidance remains important for equities, where it exerts a large and negative effect, but appears much less influential in foreign exchange markets during the crisis. Our results confirmed the increased importance of unconventional policy tools during periods of crisis.

We also found evidence that the effectiveness of FOMC announcements depends not only on the monetary shock itself, but also on the form of communication. Indeed, according to our results, communication seems to be more powerful when it is qualitative, and expectation driven. After separating qualitative and quantitative forward guidance announcements, our results showed that in quantitative policy episodes, the role of forward guidance is weaker and less systematic, while the effects of unconventional tools such as LSAPs are more isolated and asset specific. Analyzing more in depth the impact of more specific communication tools (like calendar-based, or number based forward guidance for example), will allow us to provide

more insights to find the best strategic way to influence markets, and could considerably enhance strategic decisions of central banks.

Lastly, we have found no evidence of forward guidance persistence in subsequent meetings, this result can partly be explained by the efficiency of the market and the fact that the markets instantly incorporate information during the meeting thus yields adjust on the announcement date not afterward.

6. Tables and Figures

6.1 Tables

Table 1 – Tests for the number of factors underlying interest rate responses to FOMC announcements

	df	Wald statistic	p-value
H_0: factors = 0	28	728	0.000
H_0: factors = 1	20	255.17	0.000
H_0: factors = 2	13	84.19	3.8435E-06
H_0: factors = 3	7	32	0.07742411

Note: The table reports Wald statistics testing the null hypothesis that the number of factors equals the specified value. A rejection of H_0: factors = 3 at conventional significance levels would support retaining at least 4 factors. The p-value of 0.077 for H_0: factors = 3 suggests the 3-factor model is not rejected at the 5% level.

Table 2. ***Selected Federal Reserve Forward-Guidance Announcements and Classification Criteria, 2008-2018***

Date	Extract / key wording	Type	Classification rationale	Source
2008-12-16	"... exceptionally low levels of the federal funds rate for some time."	**Qual.**	Open-ended temporal guidance; no numerical threshold or precise horizon.	FOMC statement Link
2011-06-22	"... exceptionally low levels for the federal funds rate for an extended period."	**Qual.**	Non-specific temporal guidance; no numerical threshold or measurable trigger.	FOMC statement Link
2012-10-24	"... exceptionally low levels ... likely to be warranted at least through mid-2015."	**Quant.**	Explicit calendar-based horizon, although no macroeconomic threshold is specified.	FOMC statement Link
2012-12-12	"... appropriate at least as long as the unemployment rate remains above 6-1/2 percent."	**Quant.**	Explicit numerical labour-market threshold tied to a measurable indicator.	FOMC statement Link
2014-01-29	"... appropriate well past the time that the unemployment rate declines below 6-1/2 percent."	**Quant.**	References a numerical unemployment threshold as a benchmark for policy assessment.	FOMC statement Link
2014-03-19	"The Committee will assess progress ... by monitoring incoming information ..."	**Qual.**	Broad, state-contingent language; no numerical threshold or date-based commitment.	FOMC statement Link
2018-09-26	"Further gradual increases ... consistent with sustained expansion ... and inflation near 2 percent."	**Qual.**	Directional guidance on the expected policy path without a timing commitment or operational threshold.	FOMC statement Link

Note. Qual. = qualitative guidance ; Quant. = quantitative guidance. The table has been condensed to fit a portrait-format Word page while preserving the academic layout. These events have been selected randomly to illustrate our classification method.

Table 3 - Estimated effects of changes in the federal funds rate, forward guidance, and LSAPs on stock prices and exchange rates.

	S&P 500	EUR/USD	USD/JPY	DXY
(1) MP1	***0.290	0.110	***−0.217	**−0.125
	(0.091)	(0.075)	(0.047)	(0.062)
	[3.17]	[1.48]	[−4.58]	[−2.02]
(2) MP2	***−0.379	***−0.250	***0.268	***0.241
	(0.101)	(0.087)	(0.060)	(0.074)
	[−3.75]	[−2.87]	[4.47]	[3.25]
(3) LSAPs	***−0.172	***−0.274	***0.309	***0.265
	(0.048)	(0.019)	(0.039)	(0.018)
	[−3.62]	[−14.12]	[7.82]	[14.42]
R^2	0.28	0.49	0.72	0.54
N	92	92	92	92

*Note: Coefficient estimate; [t-statistic]. Full sample of FOMC announcements, 2008–2018 (N = 92). Asterisks denote statistical significance: *** p < 0.01, ** p < 0.05, * p < 0.10. MP1 captures the surprise change in the current federal funds rate target; MP2 captures forward guidance surprises (revision in expected future rate path); LSAPs captures surprise changes in large-scale asset purchase programs. Standard errors are bootstrapped following Swanson (2021).*

Table 4 — COVID-19 Crisis Sub-Sample (2020–2022, N = 25)

	S&P 500	EUR/USD	USD/JPY	DXY
(1) MP1	2.784***	0.110	−0.217***	0.564*
	(0.693)	(0.075)	(0.047)	(0.307)
	[4.02]	[1.48]	[−4.58]	[1.84]
(2) MP2	−2.348***	−0.146*	0.032	−0.274
	(0.636)	(0.083)	(0.157)	(0.271)
	[−3.69]	[−1.77]	[0.20]	[−1.01]
(3) LSAPs	0.063	−0.242***	0.188***	0.258***
	(0.117)	(0.019)	(0.026)	(0.042)
	[0.54]	[−12.71]	[7.23]	[6.21]
R^2	0.79	0.66	0.78	0.64
N	29	29	29	29

*Note: Coefficient estimate; (standard error); [t-statistic]. Covid sub-sample of FOMC announcements, 2020–2022. Asterisks denote statistical significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. MP1 captures the surprise change in the current federal funds rate target; MP2 captures forward guidance surprises; LSAPs captures surprise changes in large-scale asset purchase programs. Standard errors are bootstrapped following Swanson (2021).*

Table 5 — Qualitative Forward Guidance Announcements (2008–2018, N = 61)

	S&P 500	EUR/USD	USD/JPY	DXY
(1) MP1	0.058	0.264***	−0.175***	−0.236***
	(0.095)	(0.101)	(0.041)	(0.079)
	[0.61]	[2.63]	[−4.29]	[−2.98]
(2) MP2	−0.225**	−0.446***	0.321***	0.403***
	(0.093)	(0.104)	(0.040)	(0.081)
	[−2.41]	[−4.27]	[8.10]	[4.95]
(3) LSAPs	−0.249***	−0.320***	0.321***	0.305***
	(0.026)	(0.029)	(0.039)	(0.029)
	[−9.62]	[−10.87]	[8.27]	[10.37]
R^2	0.49	0.63	0.81	0.68
N	61	61	61	61

*Note: Coefficient estimate; (standard error); [t-statistic]. Sub-sample restricted to qualitative FOMC announcements (communication-driven), 2008–2018. Asterisks denote statistical significance: *** p < 0.01, ** p < 0.05, * p < 0.10. MP1 captures the surprise change in the current federal funds rate target; MP2 captures forward guidance surprises; LSAPs captures surprise changes in large-scale asset purchase programs. Standard errors are bootstrapped following Swanson (2021).*

Table 6 — Quantitative Forward Guidance Announcements (2008–2018, N = 20)

	S&P 500	EUR/USD	USD/JPY	DXY
(1) MP1	0.013	−0.127***	0.081*	0.111***
	(0.148)	(0.043)	(0.043)	(0.040)
	[0.09]	[−2.94]	[1.90]	[2.75]
(2) MP2	0.046	−0.041	0.092	0.047
	(0.126)	(0.087)	(0.061)	(0.079)
	[0.36]	[−0.47]	[1.51]	[0.59]
(3) LSAPs	−0.055	−0.087	0.198***	0.099
	(0.144)	(0.095)	(0.065)	(0.086)
	[−0.38]	[−0.92]	[3.03]	[1.15]
R^2	0.03	0.32	0.65	0.36
N	20	20	20	20

*Note: Coefficient estimate; (standard error); [t-statistic]. Sub-sample restricted to quantitative FOMC announcements (balance-sheet operations), 2008–2018. Asterisks denote statistical significance: *** p < 0.01, ** p < 0.05, * p < 0.10. MP1 captures the surprise change in the current federal funds rate target; MP2 captures forward guidance surprises; LSAPs captures surprise changes in large-scale asset purchase programs. Standard errors are bootstrapped following Swanson (2021).*

Table 7 - Persistence of MP2 Effects — 2-year Treasury

Horizon	MP2 Coeff.	Std. Error	t-stat	R^2	N
h = 0	0.029	(0.020)	[1.44]	0.127	91
h = 1	-0.003	(0.020)	[-0.14]	0.003	90
h = 2	-0.019	(0.023)	[-0.82]	0.017	89
h = 3	-0.019	(0.014)	[-1.35]	0.060	88
h = 6	0.010	(0.015)	[0.69]	0.006	85
h = 9	-0.015	(0.018)	[-0.80]	0.026	82
h = 12	-0.009	(0.017)	[-0.51]	0.014	79

Notes: OLS coefficients on the MP2 (forward guidance) shock for the change in the indicated Treasury yield at horizon h (months ahead), controlling for MP1 (federal funds rate shock). *** p<0.01, ** p<0.05, * p<0.10.

Table 8: Persistence of MP2 Effects — 5-year Treasury

Horizon	MP2 Coeff.	Std. Error	t-stat	R^2	N
h = 0	0.036**	(0.018)	[1.99]	0.062	91
h = 1	0.012	(0.021)	[0.57]	0.008	90
h = 2	0.005	(0.026)	[0.21]	0.027	89
h = 3	-0.009	(0.017)	[-0.55]	0.011	88
h = 6	0.023	(0.016)	[1.42]	0.017	85
h = 9	-0.005	(0.021)	[-0.26]	0.037	82
h = 12	-0.008	(0.016)	[-0.48]	0.008	79

Notes: OLS coefficients on the MP2 (forward guidance) shock for the change in the indicated Treasury yield at horizon h (months ahead), controlling for MP1 (federal funds rate shock). *** p<0.01, ** p<0.05, * p<0.10.

Table 9: Persistence of MP2 Effects — 10-year Treasury

Horizon	MP2 Coeff.	Std. Error	t-stat	R^2	N
h = 0	0.029**	(0.012)	[2.45]	0.025	91
h = 1	0.010	(0.019)	[0.50]	0.003	90
h = 2	0.014	(0.028)	[0.49]	0.075	89
h = 3	-0.004	(0.021)	[-0.18]	0.001	88
h = 6	0.020	(0.013)	[1.58]	0.011	85
h = 9	-0.007	(0.019)	[-0.35]	0.067	82
h = 12	-0.011	(0.012)	[-0.89]	0.006	79

Notes: OLS coefficients on the MP2 (forward guidance) shock for the change in the indicated Treasury yield at horizon h (months ahead), controlling for MP1 (federal funds rate shock). *** p<0.01, ** p<0.05, * p<0.10.

Table 10: Robutness check: Asset Price Responses to Monetary Policy Shocks — 2008 Crisis (N = 11)

	SP500	**EURUSD**	**USDJPY**	**DXY**
change in federal funds rate (MP1)	0.862***	-0.117	-0.328*	0.033
	(0.311)	(0.226)	(0.195)	(0.180)
	[2.77]	[-0.52]	[-1.68]	[0.18]
change in forward guidance (MP2)	-1.144***	-0.154	0.339*	0.177
	(0.405)	(0.223)	(0.185)	(0.181)
	[-2.83]	[-0.69]	[1.83]	[0.98]
change in LSAPs	0.311*	-0.117	0.384***	0.134
	(0.159)	(0.118)	(0.046)	(0.099)
	[1.95]	[-0.99]	[8.34]	[1.35]
Regression R^2	0.66	0.42	0.82	0.44
N	11	11	11	11

*Notes: Coefficients from OLS regressions of asset price changes on monetary policy shocks. Standard errors in parentheses. t-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.10.*

Table 11: Robustness Check: Asset Price Responses to Monetary Policy Shocks — Full Sample 2008–2018, different event window: 10 minutes before and 20 minutes after announcements (N = 92)

	SP500	**EURUSD**	**USDJPY**	**DXY**
change in federal funds rate (MP1)	0.365***	0.157*	-0.248***	-0.169**
	(0.090)	(0.089)	(0.059)	(0.077)
	[4.06]	[1.77]	[-4.17]	[-2.20]
change in forward guidance (MP2)	-0.464***	-0.310***	0.313***	0.297***
	(0.102)	(0.105)	(0.079)	(0.093)
	[-4.53]	[-2.96]	[3.99]	[3.20]
change in LSAPs	-0.211***	-0.332***	0.364***	0.325***
	(0.054)	(0.032)	(0.054)	(0.035)
	[-3.95]	[-10.35]	[6.77]	[9.41]
Regression R^2	0.23	0.50	0.66	0.55
N	92	92	92	92

*Notes: Coefficients from OLS regressions of asset price changes on monetary policy shocks. Standard errors in parentheses. t-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.10.*

6.2 Figures

Figure 1: Target Surprise Shocks by Qualitative and Quantitative Forward Guidance Announcements, 2008–2018

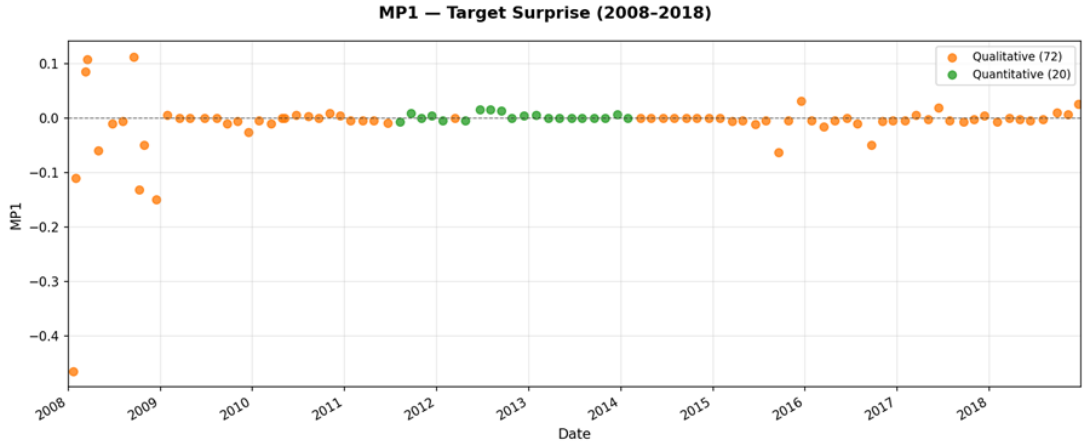


Figure 2: Path Surprise Shocks by Qualitative and Quantitative Forward Guidance Announcements, 2008–2018

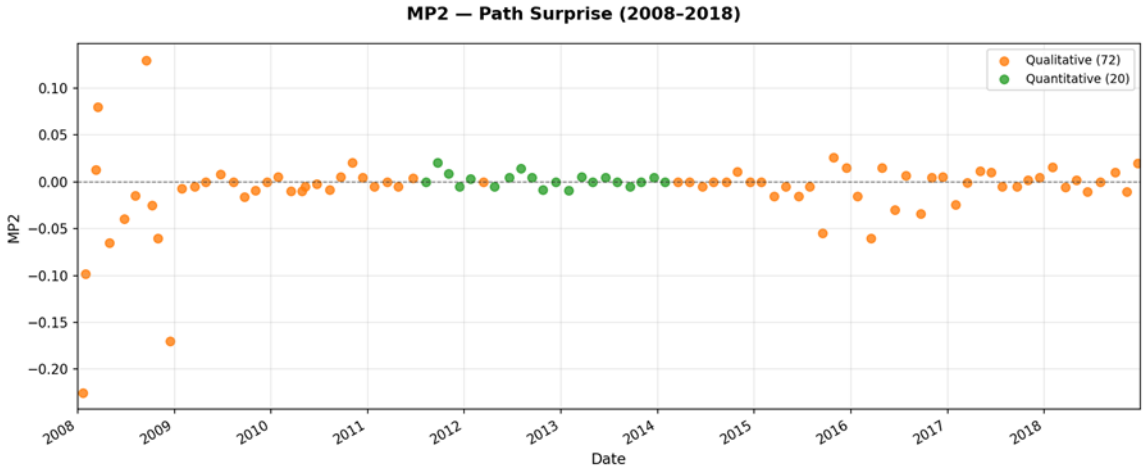


Figure 3: Balance sheet Surprise Shocks by Qualitative and Quantitative Forward Guidance Announcements, 2008–2018

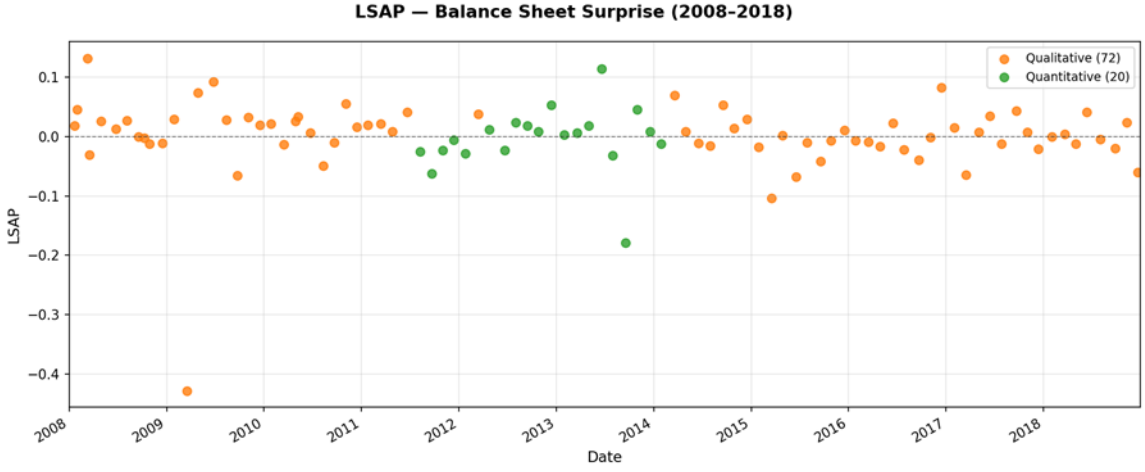
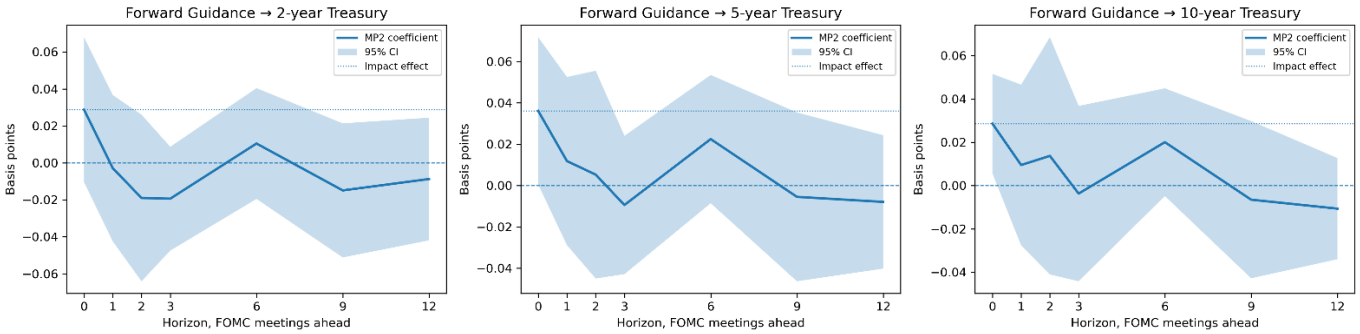


Figure 4: Persistence of Forward Guidance (MP2) Effects Controlling for MP1, (2008-2018)



7. Bibliography

Acosta, M., Ajello, A., Bauer, M., Loria, F., & Miranda-Agrippino, S. (2015). Financial Market Effects of FOMC Communication: Evidence from a New Event-Study Database. *Federal Reserve Bank of San Francisco, Working Paper Series*, *2025*(30), 01-61. https://doi.org/10.24148/wp2025-30

Andrade, P., Gaballo, G., Mengus, E., & Mojon, B. (2019). Forward Guidance and Heterogeneous Beliefs. *American Economic Journal: Macroeconomics*, *11*(3), 1–29. https://doi.org/10.1257/mac.20180141

Bauer, M. D., & Neely, C. J. (2014). International channels of the Fed's unconventional monetary policy. *Journal of International Money and Finance*, *44*, 24–46. https://doi.org/10.1016/j.jimonfin.2013.12.007

Campbell, J. R., Ferroni, F., Fisher, J. D. M., & Melosi, L. (2019). The limits of forward guidance. *Journal of Monetary Economics*, *108*, 118–134. https://doi.org/10.1016/j.jmoneco.2019.08.009

Campbell, J. Y., & Shiller, R. J. (1991). Yield Spreads and Interest Rate Movements: A Bird's Eye View. *The Review of Economic Studies*, *58*(3), 495. https://doi.org/10.2307/2298008

Cragg, J. G., & Donald, S. G. (1997). Inferring the rank of a matrix. *Journal of Econometrics*, *76*(1-2), 223–250. https://doi.org/10.1016/0304-4076(95)01790-9

Crump, R. K., Eusepi, S., & Moench, E. (2013, January 7). *Making a Statement: How Did Professional Forecasters React to the August 2011 FOMC Statement?* Liberty Street Economics. https://libertystreeteconomics.newyorkfed.org/2013/01/making-a-statement-how-did-professional-forecasters-react-to-the-august-2011-fomc-statement/

Eggertsson, G. B., & Woodford, M. (2003, September 1). *Optimal Monetary Policy in a Liquidity Trap*. National Bureau of Economic Research. https://doi.org/10.3386/w9968

Evans, J., Campbell, J., Evans, C., Fisher, J., & Justiniano, A. (2012). Macroeconomic Effects of Federal Reserve Forward Guidance. *Brookings Papers on Economic*

Activity, *43*(1 (Spring)), 1–80. https://econpapers.repec.org/article/binbpeajo/v_3a43_3ay_3a2012_3ai_3a2012-01_3ap_3a1-80.htm

Faria-e-Castro, M. (2021). Fiscal Policy during a Pandemic. *Journal of Economic Dynamics and Control*, *125*, 104088. https://doi.org/10.1016/j.jedc.2021.104088

Gürkaynak, R. S., Sack, B., & Swanson, E. T. (2005). *Do Actions Speak Louder Than Words?*

Hanson, S. G., & Stein, J. C. (2015). Monetary policy and long-term real rates. *Journal of Financial Economics*, *115*(3), 429–448. https://doi.org/10.1016/j.jfineco.2014.11.001

Jordà, Ò. (2005). Estimation and Inference of Impulse Responses by Local Projections. *The American Economic Review*, *95*(1), 161–182. https://www.jstor.org/stable/4132675

Kuttner, K. N. (2001). *Monetary Policy Surprises and Interest Rates*.

Nakamura, E., & Steinsson, J. (2018). Identification in Macroeconomics. *Journal of Economic Perspectives*, *32*(3), 59–86. https://doi.org/10.1257/jep.32.3.59

Nelson. (2024). *Central Bank Policy Rate Guidance and Financial Market Functioning*. International Journal of Central Banking. https://www.ijcb.org/journal/v4n4/central-bank-policy-rate-guidance-and-financial-market-functioning

Nelson, E. (2021). The Emergence of Forward Guidance As a Monetary Policy Tool. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3784642

Shiller, R. J., & University of Pennsylvania. Department of Economics. (1978). *The Volatility of Long-term Interest Rates and Expectations Models of the Term Structure*.

Svensson, L. E. O. (2014, December 1). *Forward Guidance*. National Bureau of Economic Research. https://doi.org/10.3386/w20796

Swanson, E. T. (2021). Measuring the effects of federal reserve forward guidance and asset purchases on financial markets. *Journal of Monetary Economics*, *118*, 32–53. https://doi.org/10.1016/j.jmoneco.2020.09.003

Swanson, E. T., Williams, J. C., & Bureau, N. (2014). *Measuring the Effect of the Zero*

Lower Bound on Medium- and Longer-Term Interest Rates.

The Fed - Transcripts and other historical materials. (n.d.). Board of Governors of the Federal Reserve System. https://www.federalreserve.gov/monetarypolicy/fomc_historical.htm