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The Overdelivery Premium: When Monetary Policy Decisions Exceed Market Expectations

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The Overdelivery Premium: When Monetary Policy Decisions Exceed Market Expectations

Michael Ehrmann* Paul Hubert†

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Abstract

Monetary policy effects are usually identified through surprises. We explore whether their effects differ when central banks exceed market expectations ("overdelivery") versus fall short ("underdelivery"). We argue that these cases arise under fundamentally different conditions. As a result, they might send signals of different strength. Using panel evidence across 14 economies and US and euro area time-series evidence, we document that short-term interest rates respond up to ten times more to overdelivery surprises. Furthermore, they carry different informational content: overdelivery triggers macroeconomic forecast revisions consistent with central bank information effects, while underdelivery generates revisions in line with standard monetary transmission.

JEL classification: E52, E44, D84.

Keywords: Monetary policy identification, Central bank information effects, Perceived reaction function, Policy rate expectations.

*Frankfurt School of Finance Management; CEPR. m.ehrmann@fs.de.

†Banque de France and Sciences Po - OFCE. paul.hubert@sciencespo.fr.

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1 Introduction

A central principle of monetary policy identification is that market surprises, defined as changes in policy expectations around policy announcements, provide the exogenous variation needed for causal inference about monetary transmission. Yet two monetary surprises of identical magnitude can arise from fundamentally different situations. Consider two scenarios in which financial markets experience a 25 basis points (bp) tightening surprise: in the first, the central bank raises rates by 50 bp when markets expected 25 bp, whereas in the second, the central bank reduces rates by 25 bp when markets expected a 50 bp cut. While conventional measures treat these surprises as equivalent, they originate from distinct decision settings (Hamilton and Jordà 2002). In the first, the decision exceeds market expectations, the central bank "overdelivers", whereas in the second, the decision falls short of expectations, so the central bank "underdelivers". Standard macroeconomic models and the empirical literature typically assume that both over- and underdelivery surprises are the same and have a similar impact, i.e. that only the surprise component matters, regardless of its direction relative to expectations. This paper investigates whether this assumption holds, or whether in contrast the distinction matters for asset price responses and, if so, why.

The conceptual motivation for distinguishing over- from underdelivery rests on the information content of central bank decisions. When a central bank overdelivers, the endogenous policy response and the surprise move in the same direction (a tightening of policy also generates a tightening surprise, and equivalently for easing), potentially signaling more pronounced economic conditions (Nakamura and Steinsson 2018) or a greater policy response (Bauer et al. 2024). In contrast, an underdelivery happens when either the central bank decides to keep rates unchanged even though some change had been expected, or the endogenous policy response and the surprise move in opposite directions (a tightening action coincides with an easing surprise and vice versa). Understanding whether investors respond differently to these two types of surprises has implications for how we interpret monetary policy surprises and their effects on asset prices.

A differential response of asset prices could arise if these distinct cases carry different informational signals. Monetary surprises move asset prices only if they prompt investors to revise their beliefs, about either the economic outlook and/or the parameters of the central bank's reaction function. Both overdelivery and underdelivery could in principle trigger such learning. However, investors might receive a stronger signal from an overdelivery decision. To see this, it is helpful to consider that the central bank takes its policy decisions in line with a Taylor rule of the form: $r_t = r^* + \phi_t^{\pi}(\mathbb{E}_t\pi_{t+h} - \pi^*) + \phi_t^{y}(\mathbb{E}_t y_{t+h} - y^*) + \epsilon_t$.[1] Two conditions need to hold simultaneously for the central bank to overdeliver. First, it must feel the need for more aggressive action. This can arise due to more pronounced economic conditions, i.e. an update of $\mathbb{E}_t\pi_{t+h}$ and/or $\mathbb{E}_t y_{t+h}$, or because the central bank wants to be more responsive to economic conditions, i.e. because it applies higher coefficients ϕ_t^{π} and/or ϕ_t^{y}. In addition, a second condition must hold, namely that policymakers overcome their well-known preferences for gradualism (Bernanke 2004). Central banks tend to adjust policy rates incrementally, i.e. they prefer small or moderate changes over aggressive action. This is usually represented through the inclusion of a smoothing parameter in empirical variants of the Taylor rule. Hence, beyond seeing the need for action, overdelivery also requires that the central bank takes more decisive action than expected. In contrast, under-

[1] r_t is the policy rate, r^* the neutral rate, $\mathbb{E}_t\pi_{t+h}$ and $\mathbb{E}_t y_{t+h}$ the central bank assessment of inflation π and output y at horizon h, π^* the central bank's inflation target and y^* potential output. ϕ_t^{π} and ϕ_t^{y} are the inflation and output response parameters. ϵ_t is a monetary policy shock.

delivery arises as soon as one of these conditions fails to hold: the central bank is satisfied with a weaker response,[2] *or* policymakers adhere to their smoothing preferences. Because investors cannot distinguish between the multiplicity of interpretations, underdelivery creates a signal extraction problem that makes its information content more ambiguous and limits the belief revision it triggers, thus attenuating asset price responses relative to overdelivery.[3]

For the purpose of this paper, identifying over- versus underdelivery presents several empirical challenges. First, as monetary policy decisions are generally well anticipated by markets, the number of over- or underdelivery surprises is likely to be small in each economy. This scarcity calls for a cross-country panel approach to achieve sufficient statistical power. Second, the standard approach to measuring monetary surprises using high-frequency changes in policy expectations captures the surprise component of the policy rate but also of additional monetary policy instruments, signals about the future policy path, and term and risk premia. This approach cannot isolate whether the policy rate moved further or not than expected and does not enable categorizing over- or underdelivery. The most relevant alternative measure that would be required for this purpose, futures-based measures of current decision surprises, is available with sufficient history only for the United States and the euro area. For these reasons, we turn to survey-based measures of expectations, specifically the Bloomberg survey of economists, which provides cross-country comparable policy rate forecasts collected shortly before each monetary policy meeting.

Our empirical strategy combines this survey-based expectation measure with a standard event-study framework in a panel of 14 advanced economies over the period 1997-2023. We classify each monetary policy decision as overdelivery, underdelivery, or "as expected" based on whether the magnitude of the policy rate change exceeds, falls short of, or matches the magnitude of the expected change. We then construct corresponding monetary surprises, the difference between the realized and expected policy rate, and estimate their effects on a range of asset prices, including short- and long-term interest rates, and stock prices. The use of Bloomberg survey expectations offers three advantages: the surveys are conducted systematically across countries using a comparable methodology, over a long sample, and they capture market expectations of the policy rate, enabling a clear classification of over- and underdelivery decisions. Our analysis reveals that 18% of decisions are classified as overdelivery decisions and 20% as underdelivery, with the rest representing fully anticipated decisions. These surprises are distributed across countries and time, across tightening and easing decisions and across different magnitudes of adjustment.

The central result of this paper is, using panel or individual country dimensions, that overdelivery surprises generate much stronger responses than underdelivery surprises of comparable magnitude. This difference, which we label the "overdelivery premium", is statistically significant and large: for short-maturity interest rates, a 100 basis point overdelivery tightening surprise increases rates by around 100 basis points, while an equivalent underdelivery tightening surprise has an effect of less than 10 basis points. The premium is most pronounced for short maturities (one-month to one-year rates) and diminishes for longer-term yields, suggesting that over- or underdelivery conveys information primarily about near-term policy intentions.

[2]The weaker response could arise if the central bank has a weaker assessment of the economy or is less responsive to economic conditions, but also if uncertainty is elevated, in line with Brainard (1967)'s conservatism principle.

[3]The signal extraction problem is even more acute when the central bank does not publish voting records together with the decision, as an inability to achieve consensus for a larger move could also trigger an underdelivery decision. As several central banks in our sample publish voting records, we abstract from this condition here.

This overdelivery premium is robust to various measurements and specifications. Crucially, the premium is found equally for tightening and easing surprises, as well as for tightening and easing cycles. The overdelivery premium is also robust to using high-frequency intraday current-decision surprises for the United States and the euro area. Finally, local projections show that the initial overdelivery premium persists for several days without reversal.

Three potential channels could explain the overdelivery premium. First, over- and underdelivery may carry different information about the central bank's views of current and future economic conditions, a phenomenon known as central bank information effects. Second, the two types of surprises may lead investors to update their beliefs differently about the parameters of the central bank's reaction function. Third, market participants may exhibit reference-dependent preferences (Kahneman and Tversky 1979) whereby outcomes are evaluated relative to a reference point (prior expectations), leading them to overreact when central bank decisions exceed expectations but underreact when decisions fall short.

To distinguish among these channels, we implement three separate tests. First, we analyze how over- and underdelivery surprises affect professional forecasters' macroeconomic forecasts of inflation, unemployment and GDP growth using Bloomberg and Consensus Economics data. If overdelivery surprises signal that the central bank judges economic conditions as more pronounced than markets believed, we should observe forecast revisions that move in the opposite direction to what standard monetary transmission would predict. Second, we estimate perceived central bank reaction functions at the country-month level. We exploit cross-sectional variation across forecasters in regressions of interest rate forecasts on inflation and output forecasts from Consensus Economics data (following Bauer et al. 2024), and examine whether monetary policy surprises lead to revisions in the perceived intercept, smoothing parameter, or responsiveness to inflation or output. Third, to explore whether the overdelivery premium reflects a general behavioral phenomenon of reference-dependent reactions to news, we assess asset price responses to the surprise component contained in macroeconomic data releases (inflation, industrial production, GDP, unemployment) based on Bloomberg data, and test whether "overdelivery" of macroeconomic news (i.e. data releases that exceed expectations) also generates stronger market reactions.

Estimates from these tests point toward central bank information effects as the primary explanation for the overdelivery premium. Overdelivery surprises lead to significant revisions in macroeconomic forecasts in directions consistent with information effects: a tightening overdelivery surprise raises inflation forecasts and lowers unemployment forecasts, while an easing overdelivery surprise has the opposite effects. In contrast, underdelivery surprises generate forecast revisions consistent with standard monetary policy transmission: tightening surprises lower inflation and raise unemployment forecasts, and vice versa for easing surprises. In line with the standard lags in monetary policy transmission, the revisions in response to underdelivery surprises are only found for longer forecasting horizons. This pattern is consistent with overdelivery surprises reflecting information effects and underdelivery surprises behaving like standard monetary shocks, a distinction masked when pooling all surprises together.

These forecast revisions help explain an apparent puzzle: despite generating large interest rate responses and strong information effects, overdelivery surprises do not lead to significant stock price responses. This reflects two offsetting channels operating simultaneously. When an overdelivery tightening surprise signals stronger economic conditions, this creates a positive cash flow

effect (higher expected earnings) but also a negative discount rate effect (expectations of tighter future policy based on the endogenous policy response to those conditions). For stock prices, these cancel out. For interest rates, both push in the same direction, explaining the strong response of short-term interest rates.

When measuring perceived reaction functions, we find that overdelivery surprises lead to revisions in the estimated intercept but affect neither the estimated policy responsiveness to inflation or output, nor the perceived smoothing parameter. This finding suggests that overdelivery conveys information about the appropriate level of policy rates, consistent with the central bank's assessment of economic conditions. Finally, we find no evidence of an overdelivery premium for other macroeconomic data releases: over- and underdelivery of macroeconomic news generate statistically similar interest rate responses. This result rules out the reference-dependent utility explanation and suggests that the overdelivery premium is specific to monetary policy.

This paper makes two contributions. First, it documents a novel empirical regularity in monetary policy transmission: overdelivery surprises have stronger effects on interest rates than underdelivery surprises, particularly at short horizons. Second, the paper provides evidence on when and why central bank information effects may emerge. Various works have suggested that monetary policy announcements can convey information about the central bank's views about the economic outlook (Ellingsen and Söderström 2001, Campbell et al. 2012, Jarociński and Karadi 2020, Miranda-Agrippino and Ricco 2021).[4] In contrast, recent works challenge the existence and regularity of these information effects (Karnaukh and Vokata 2022, Bauer and Swanson 2023, Hoesch et al. 2023, Swanson et al. 2025).[5] Yet, little is known about which features of policy decisions generate information effects. Our results show that standard monetary surprises, pooling over- and underdelivery, may exhibit information effects on average, but this masks a sharp heterogeneity: information effects arise from overdelivery episodes, while underdelivery generates responses consistent with standard monetary transmission. This distinction reconciles earlier findings and helps clarify the conditions under which information effects could emerge.

The closest paper to ours is Hamilton and Jordà (2002), who use a nonlinear hazard model of the federal funds rate target to show that an unexpected policy tightening has different effects on macroeconomic forecasts than not delivering an anticipated easing, an asymmetry masked in standard linear VARs. Their focus is on modeling the policy decision process itself and on how the *source* of a forecast error affects macroeconomic predictions. In contrast, our contribution lies in documenting heterogeneous asset-price reactions and linking them to information effects. Whereas their seminal work emphasizes nonlinearities in the policy rule, we show that nonlinearities arise in the transmission of monetary policy surprises.

Our paper complements the large literature on the identification of monetary policy (Romer and Romer 2004, Ramey 2016). Seminal studies such as Cook and Hahn (1989), Kuttner (2001), Cochrane and Piazzesi (2002), Bernanke and Kuttner (2005), Gürkaynak et al. (2005a), along with more recent contributions including Gertler and Karadi (2015), Altavilla et al. (2019), Wolf (2020) and Swanson (2021), have focused on measuring the unexpected component of policy decisions

[4] See also Nakamura and Steinsson (2018), Cieslak and Schrimpf (2019), Lakdawala and Schaffer (2019), Lunsford (2020), Kerssenfischer (2022), Golez and Matthies (2025) and Pelin (2026).

[5] The debate remains active, with several recent works further exploring central bank information effects (Jarociński and Karadi 2025, Ricco and Savini 2025, Miranda-Agrippino and Williams 2026).

using market-based surprises.[6] Our contribution is to show that not all surprises of a given size are equivalent: their effects depend critically on whether they arise from the central bank exceeding or falling short of expectations. Standard identification strategies confound those two different types of shocks. Our findings suggest that future work on monetary policy transmission may benefit from incorporating the over- and underdelivery distinction when using monetary surprises.

This paper also contributes to the literature documenting heterogeneous effects of monetary policy related to the sign of policy changes (Cover 1992, Weise 1999, Tenreyro and Thwaites 2016, Adrian et al. 2024, Hubert and Portier 2025), the magnitude of shocks (Angrist et al. 2018, Ascari and Haber 2022), and the environment (Olivei and Tenreyro 2007, Paul 2020, Alpanda et al. 2021, Berger et al. 2021, Eichenbaum et al. 2022, Vandeweyer et al. 2026, Amodeo 2026). Our results introduce a new dimension of heterogeneity: over- and underdelivery depends on the interaction between the policy action and prior expectations. This distinction generates large differences in the monetary transmission even after controlling for the sign, size and economic context of policy decisions. Understanding this dimension is essential for assessing the effects of monetary policy.

2 Over- and underdelivery monetary policy surprises

2.1 Categorizing surprise types

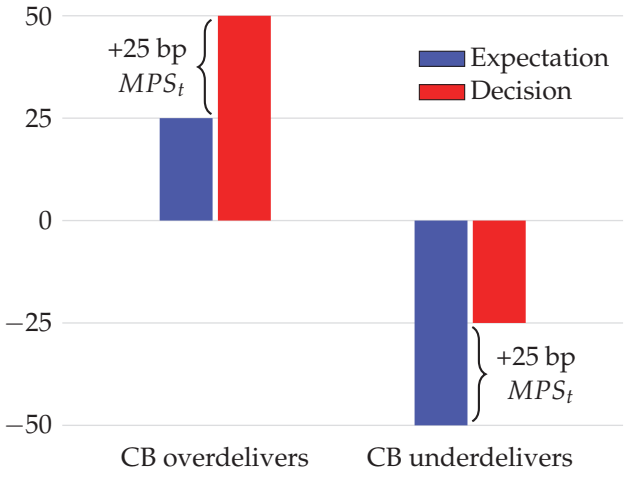
Central to our analysis is the distinction between "overdelivery" and "underdelivery" monetary policy surprises. We define a monetary policy surprise as overdelivery when the central bank's action exceeds what investors anticipated in terms of magnitude, regardless of the direction of the policy change. Conversely, underdelivery surprises occur when the central bank's action falls short of market expectations.

To illustrate this distinction, consider two scenarios in which financial markets experience an identical 25 bp tightening surprise. In the first scenario, the central bank raises rates by 50 bp when markets expected 25 bp such that the decision and the surprise move in the same direction. In the second scenario, the central bank reduces rates by 25 bp when markets expected a 50 bp cut. In this case, the decision and the surprise move in opposite directions. While conventional measures of monetary policy surprises would treat these two events as equivalent (both generating a +25 bp tightening surprise), they originate from fundamentally different decision environments. The first represents overdelivery: the policy action reinforces and exceeds expectations. The second represents underdelivery: the policy action falls short of expectations.

Figure 1 illustrates this conceptual distinction graphically. The left panel shows an overdelivery scenario where the decision exceeds expectations by moving further in the anticipated direction. The right panel shows an underdelivery scenario where the decision falls short of expectations, moving less than anticipated. Three comments are worth making. First, while this example involves 50 bp (expected) changes, over- and underdelivery are not restricted to large (expected) adjustments. Second, overdelivery can occur from an expected status quo, just as underdelivery can arise from a status quo decision. Third, while our representation is intentionally schematic, the average magnitude of monetary policy surprises in our sample is much smaller, around 3 bp.

[6] See also Krueger and Kuttner (1996), Rigobon and Sack (2004), D'Amico and Farka (2011), Barakchian and Crowe (2013), Acosta (2024), Boehm and Kroner (2024), Aruoba and Drechsel (2024), Acosta et al. (2025), Hack et al. (2025).

Figure 1: Over/underdelivery monetary policy surprises



Let r_m represent the actual policy rate announced at meeting m on day t and r_{m-1} the policy rate from the previous meeting $m-1$. The change in policy rates at meeting m is then given as $\Delta r_m = r_m - r_{m-1}$. Furthermore, let $\mathbb{E}_{t-j}[r_m]$ denote the market expectation of the policy rate at meeting m, formed at day $t-j$, where j represents the number of days between the expectation formation and the policy announcement. The expected change in policy rates is then given by $\mathbb{E}_{t-j}[\Delta r_m] = \mathbb{E}_{t-j}[r_m] - r_{m-1}$.

We define overdelivery and underdelivery monetary policy surprises as the difference between the realized and expected policy rate change (Rudebusch 1998):

$$MPS_t^{Over} = \begin{cases} r_m - \mathbb{E}_{t-j}[r_m] & \text{if } \left(\Delta r_m > \mathbb{E}_{t-j}[\Delta r_m] \geq 0\right) \vee \left(\Delta r_m < \mathbb{E}_{t-j}[\Delta r_m] \leq 0\right) \\ 0 & \text{otherwise} \end{cases}$$

$$MPS_t^{Under} = \begin{cases} r_m - \mathbb{E}_{t-j}[r_m] & \text{if } \left(\mathbb{E}_{t-j}[\Delta r_m] > \Delta r_m \geq 0\right) \vee \left(\mathbb{E}_{t-j}[\Delta r_m] < \Delta r_m \leq 0\right) \\ 0 & \text{otherwise} \end{cases}$$

The classification hinges on comparing the actual policy rate change to the expected change. When the central bank moves the policy rate by more than the market anticipated, we classify this as overdelivery and assign the surprise to MPS_t^{Over}.[7] When the central bank moves by less than anticipated, we classify this as underdelivery and assign the surprise to MPS_t^{Under}. Importantly, this classification is independent of the sign of the surprise: both positive (tightening) and negative (easing) surprises can be either overdelivery or underdelivery events.

A special case arises when the central bank maintains the status quo (no rate change) but financial markets had expected a change. These events are classified as underdelivery, since the actual decision ($\Delta r_m = 0$) necessarily falls short in magnitude of any non-zero expected change ($\mathbb{E}_{t-j}[\Delta r_m] \neq 0$). This classification is consistent with our conceptual framework: a status quo decision when change was expected represents the central bank doing less than anticipated. Given the special nature of these cases, we document that our main result is robust to excluding them.

[7] We observe no instances where the actual and the expected rate change have the opposite sign, that is, no cases where markets expected a rate hike but the central bank cut rates, or vice versa.

2.2 Bloomberg monetary policy surprises

We construct our monetary policy surprise measures using Bloomberg survey data, which captures market participants' expectations of central bank policy rate decisions. The Bloomberg survey polls a panel of professional forecasters, including analysts from investment banks, asset managers, and economic research institutions, asking them to predict the level of the policy rate that will be announced at the upcoming monetary policy meeting. Surveys are typically conducted in the week prior to each policy announcement. Crucially, economists can revise their submissions until 17.00 the day before the announcement, meaning that our surprise measure effectively captures expectations formed the day before the policy decision. For each meeting, Bloomberg reports the mean, median, maximum and minimum expectation as well as the number of respondents.

Our approach builds on the established literature that uses the difference between actual policy decisions and prior market expectations to identify monetary policy surprises (Kuttner 2001, Gürkaynak et al. 2005a). The key advantage of Bloomberg survey data (see also Checo et al. 2024) for our purposes is threefold. First, the surveys are conducted systematically across countries using a comparable methodology, enabling us to construct a panel of policy surprises for multiple economies. Second, the surveys directly elicit expectations about the level of the policy rate decision, not expectations about futures prices or other derivative instruments, which allows us to cleanly identify whether the central bank exceeded or fell short of expectations in terms of the actual policy instrument. Third, Bloomberg surveys have sufficient historical coverage to provide meaningful sample sizes for our analysis, spanning nearly three decades for major economies.

Our dataset encompasses 14 advanced economies: Australia, Canada, the Czech Republic, Iceland, Israel, Japan, South Korea, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, the euro area, and the United States. The sample period extends from 1997 (or the first available date for each country) to 2023, encompassing 2 381 monetary policy announcements.

Table 1: Relevance test for Bloomberg surprises

	1m	**3m**	**6m**	**12m**
$MPS_{c,t}$	0.718***	0.707***	0.839***	0.402***
	[0.03]	[0.03]	[0.03]	[0.02]
R^2	0.21	0.21	0.24	0.14
Obs	2 064	2 214	1 968	2 210
	2y	**5y**	**10y**	**Stock**
$MPS_{c,t}$	0.277***	0.189***	0.151***	-0.591**
	[0.02]	[0.02]	[0.02]	[0.29]
R^2	0.08	0.03	0.03	0.002
Obs	2 259	2 381	2 381	2 378

Note: Standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (1) using OLS. The dependent variable is the daily change in the indicated asset prices for country c on date t, regressed on the Bloomberg-based monetary policy surprise. The constant is not reported.

We validate the relevance of these Bloomberg-based surprises by documenting their impact on asset prices. Table 1 reports results from estimating:

$$\Delta Y_{c,t} = \alpha + \beta \cdot MPS_{c,t} + \epsilon_{c,t} \tag{1}$$

where $\Delta Y_{c,t}$ represents the daily change in various asset prices in country c at date t, and $MPS_{c,t} = r_m - \mathbb{E}_{t-j}[r_m]$ is the monetary policy surprise based on the mean expectation recorded in the Bloomberg survey. We only include observations on the days of monetary policy announcements. The results confirm that Bloomberg surprises generate statistically significant and economically meaningful responses across different asset classes. Short-term interest rates respond strongly, with a one percentage point surprise generating approximately 70-80 bp responses at the one-month to six-month maturity, declining to 40 bp at the one-year maturity. The effects become smaller at longer maturities (28, 19, and 15 bp for two-, five-, and ten-year rates respectively). Stock prices respond negatively to tightening surprises, consistent with the contractionary effects of unexpected monetary tightening. These patterns confirm that Bloomberg-based surprises capture relevant policy shocks that move asset prices in expected directions.[8]

Table 2: Descriptive statistics

Occurrences					
Total	**As Expected**	**Overdelivery**		**Underdelivery**	
2 381	1 482	419		480	
		Pos surp.	**Neg surp.**	**Pos surp.**	**Neg surp.**
		216	203	279	201
		$\leq$ 25 bp	**$>$ 25 bp**	**$\leq$ 25 bp**	**$>$ 25 bp**
		261	158	457	23
Absolute MP surprises					
	Nb. Obs	Mean	SD	Min	Max
$\lvert MPS_{c,t}\rvert$	2 381	0.03	0.08	0.00	1.17
$\lvert MPS^{Over}_{c,t}\rvert$	419	0.13	0.12	0.01	0.90
$\lvert MPS^{Under}_{c,t}\rvert$	480	0.06	0.09	0.01	1.17
$\lvert MPS^{Over}_{c,t}\rvert$ for positive $MPS^{Over}_{c,t}$	216	0.10	0.10	0.01	0.61
$\lvert MPS^{Under}_{c,t}\rvert$ for positive $MPS^{Under}_{c,t}$	279	0.06	0.11	0.01	1.17
$\lvert MPS^{Over}_{c,t}\rvert$ for negative $MPS^{Over}_{c,t}$	203	0.16	0.14	0.01	0.90
$\lvert MPS^{Under}_{c,t}\rvert$ for negative $MPS^{Under}_{c,t}$	201	0.06	0.06	0.01	0.30

Note: This table reports descriptive statistics for the full sample of monetary policy announcements across 14 advanced economies over 1997–2023. The top panel shows the number of decisions classified as "as expected", "overdelivery", and "underdelivery", further distinguishing positive and negative surprises and the distribution of surprise magnitudes. The bottom panel reports summary statistics for the Bloomberg-based monetary policy surprise $MPS_{c,t}$ and its over- and underdelivery components. Surprise measures are expressed in percentage points and absolute values. We provide robustness tests in Section 3.3 when excluding extreme observations.

Table 2 presents descriptive statistics for this sample, breaking down observations by surprise category and characteristics. Of the 2 381 total observations, 1 482 (62%) were fully anticipated by investors, meaning the actual policy rate decision exactly matched the mean Bloomberg expectation. The remaining 899 observations constitute our identifying sample of monetary surprises, with 419 (18% of total observations) classified as overdelivery and 480 (20%) classified as underdelivery. This distribution reveals that monetary policy surprises occur with significant frequency even during a period with enhanced central bank communication and forward guidance, and that overdelivery and underdelivery events are roughly balanced in terms of occurrence.

[8]The correlation of Bloomberg surprises with high-frequency target shocks (from Acosta et al. 2024) in the United States is 0.71, and with high-frequency changes in 1-week OIS (from Altavilla et al. 2019) in the euro area is 0.66.

The distribution of surprises across positive and negative rate changes is also relatively balanced. Among overdelivery surprises, 216 involve positive surprises (policy tightening beyond expectations) while 203 involve negative surprises (policy easing beyond expectations). Similarly, underdelivery surprises comprise 279 positive and 201 negative instances. This symmetry is important because it suggests that our results are unlikely to be driven by asymmetries related to the business cycle or the direction of monetary policy adjustments.

Table 2 also categorizes surprises by the magnitude of the actual policy rate change. Most surprises involve standard adjustments of 25 bp or less: 261 overdelivery and 457 underdelivery observations fall into this category. Larger adjustments exceeding 25 bp are less frequent but still constitute an important share of the sample, with 158 overdelivery and 23 underdelivery observations. The relative scarcity of large underdelivery surprises reflects the fact that when central banks make large policy adjustments (e.g., 50 or 75 bp), they typically exceed rather than fall short of expectations.

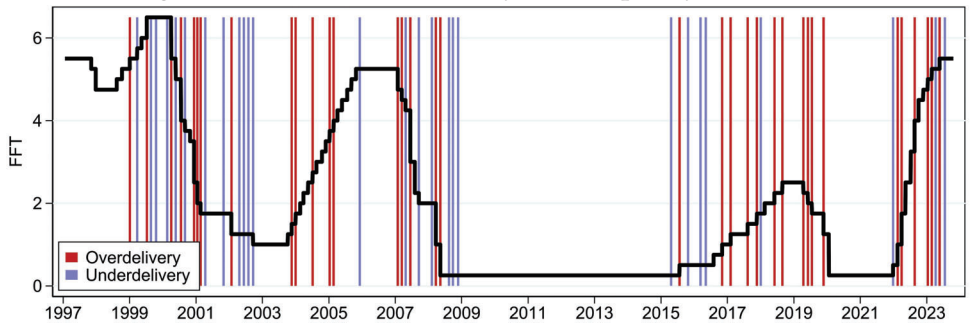
The bottom panel of Table 2 presents summary statistics for the monetary policy surprises themselves, measured in absolute values. The mean absolute overdelivery surprise is 0.13 percentage points with a standard deviation of 0.12, while the mean absolute underdelivery surprise is 0.06 percentage points with a standard deviation of 0.09. This difference indicates that when central banks exceed expectations, they tend to do so by larger margins than when their decisions fall short of expectations. The asymmetry is particularly pronounced for negative (easing) surprises, where overdelivery events average 0.16 percentage points compared to 0.06 percentage points for underdelivery events. For positive (tightening) surprises, the difference is smaller but still notable: 0.10 percentage points for overdelivery versus 0.06 percentage points for underdelivery.

This difference in magnitudes raises an important identification concern: if overdelivery surprises are systematically larger than underdelivery surprises, any differential market response could reflect the larger size of the shocks rather than a qualitative difference in how investors interpret central bank decisions that exceed versus fall short of expectations. We address this concern directly in our empirical analysis through standardization tests and sample restrictions that control for surprise magnitude, allowing us to isolate the pure effect of exceeding versus falling short of expectations.

2.3 Over- and underdelivery in the United States

Figure 2 illustrates the time series of overdelivery and underdelivery surprises for the United States over our sample period. The figure plots the federal funds target rate (black line) along with vertical bars indicating the timing of overdelivery surprises (red bars) and underdelivery surprises (blue bars). Several patterns are worth noting. First, both types of surprises occur throughout the sample period, not just during particular episodes or crisis periods. Second, when the policy rate is not changed, surprises are necessarily underdelivery events, since any expected change combined with a status quo decision creates a gap where the central bank did less than anticipated. Third, with policy rates at their effective lower bound and clarity that the policy rate will stay unchanged (such as in the period 2009-2015), no surprises are recorded. Appendix Figure A1 presents the equivalent figure for the euro area, showing similar patterns.

Figure 2: Over/underdelivery FOMC policy rate decisions



Note: This figure displays the distribution of over- (red bars) and underdelivery (blue bars) monetary policy surprises over time in the United States. The black line plots the Federal Fed Funds target in percentage points.

The cross-country variation in surprise frequency is documented in Appendix Table A1, which reports the number of overdelivery and underdelivery observations for each country in our sample. All countries experience both types of surprises, though the exact frequencies vary with the number of policy meetings in each sample and the predictability of each central bank's policy decisions. Countries with longer sample periods and more frequent policy meetings (such as the United States with 35 overdelivery and 27 underdelivery events, or the euro area with 23 overdelivery and 57 underdelivery events) mechanically contribute more to our identifying variation.

3 The overdelivery premium

3.1 Baseline estimates

Our central empirical approach estimates the differential impact of overdelivery versus underdelivery monetary policy surprises on asset prices. We employ the following cross-country panel regression specification:

$$\Delta Y_{c,t} = \alpha + \beta_O \, MPS^{Over}_{c,t} + \beta_U \, MPS^{Under}_{c,t} + \epsilon_{c,t} \tag{2}$$

where $\Delta Y_{c,t}$ is the daily change in a given asset price in country c at announcement date t, $MPS^{Over}_{c,t}$ is an overdelivery monetary surprise measured using Bloomberg survey data, and $MPS^{Under}_{c,t}$ is an underdelivery monetary surprise measured using Bloomberg survey data. Equation 2 is estimated with OLS and heteroskedasticity-robust standard errors.

The key parameters of interest are β_O and β_U, which measure the response of asset prices to overdelivery and underdelivery monetary surprises, respectively. Our primary hypothesis centers on the difference $\beta_O - \beta_U$, which we label the "overdelivery premium". A positive and statistically significant difference for the reaction of interest rates would indicate that investors respond more strongly when central banks exceed expectations compared to when they fall short. For stock prices, this would be the case if we identify a negative and statistically significant difference.

Table 3 uses the average Bloomberg survey expectation to compute the monetary surprise and presents our baseline findings across different asset classes and maturities. Table A2 uses the median of survey expectations and displays similar results. The central result of this paper is a striking asymmetry in how investors process monetary policy surprises. For short-term interest

rates (1-month to 12-month maturities), overdelivery surprises generate larger market responses than underdelivery surprises of equivalent magnitude.

The differences in the market reactions are economically significant. A one percentage point overdelivery surprise generates responses ranging from 100 bp at the 1-month maturity to 54 bp at the 12-month maturity. In contrast, equivalent underdelivery surprises produce responses of only 9 to 15 bp across the same maturities. This yields an overdelivery premium of 91, 82, 85, and 39 bp for the 1-month, 3-month, 6-month, and 12-month maturities respectively, all statistically significant at the 1% level. In other words, overdelivery surprises have effects that are up to ten times larger than underdelivery surprises at short maturities. This heterogeneity means that investors interpret these surprises differently, and as a consequence, that the standard identification approach, which treats surprises of the same magnitude equally, may actually confound two different types of shocks.

Table 3: Over- vs. underdelivery monetary surprises

	1m	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$	1.003***	0.944***	0.993***	0.536***
	[0.27]	[0.26]	[0.30]	[0.08]
$MPS^{Under}_{c,t}$	0.089**	0.122***	0.148**	0.147**
	[0.03]	[0.04]	[0.07]	[0.07]
Diff *Over–Under*	0.914***	0.822***	0.845***	0.389***
	[0.27]	[0.27]	[0.31]	[0.11]
R^2	0.28	0.26	0.28	0.18
Obs	2 064	2 214	1 968	2 210
	2y	**5y**	**10y**	**Stock**
$MPS^{Over}_{c,t}$	0.321***	0.190***	0.163***	-0.736
	[0.04]	[0.03]	[0.02]	[0.57]
$MPS^{Under}_{c,t}$	0.175**	0.186**	0.123**	-0.138
	[0.08]	[0.07]	[0.06]	[0.72]
Diff *Over–Under*	0.146	0.004	0.040	-0.598
	[0.09]	[0.08]	[0.06]	[0.91]
R^2	0.08	0.03	0.03	0.00
Obs	2 259	2 381	2 381	2 378

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

The overdelivery premium attenuates as we move to longer maturities. At the 2-year horizon, the coefficient on overdelivery surprises falls to 32 bp compared to 18 bp for underdelivery surprises, and the difference is no longer statistically significant. For 5-year and 10-year rates, both types of surprises generate similar responses around 12-19 bp, with no meaningful premium. This maturity pattern suggests that the overdelivery premium primarily affects investors' perceptions of factors governing near-term monetary policy rather than long-run term premia. Notably, the asymmetry does not extend to stock prices. Both overdelivery and underdelivery surprises generate statistically insignificant and similar responses, suggesting that the information content of over- versus underdelivery does not translate into differential equity valuations, a point we will investigate further in Section 4.3.

While the significant differential impact on interest rates up to one year might suggest that signals regarding the future policy path are driving the effect, our analysis focuses strictly on surprises to the current policy rate decision. Furthermore, using the target and path surprise series of Acosta et al. (2024) for the United States, we find no evidence that overdelivery events are characterized by larger path surprises. On the contrary, underdelivery decisions are associated with larger path surprises on average (10 bp versus 8 bp for overdelivery decisions), although this difference is not statistically significant.

3.2 Does overdelivery reflect sign asymmetry?

A natural concern is whether our overdelivery premium reflects previously documented asymmetries related to the sign of monetary policy surprises. The literature has established that tightening and easing shocks can have different effects on asset prices and the real economy. To address this, Table 4 decomposes our results by both the overdelivery/underdelivery distinction and the sign of the surprise.

The results show that the overdelivery premium exists for both positive (tightening) and negative (easing) surprises. For positive surprises, overdelivery generates responses of 90 bp at the 1-month maturity versus 3 bp for underdelivery (a difference of 87 bp). For negative surprises, the same pattern emerges: overdelivery produces 106 bp responses versus 27 bp for underdelivery, yielding a 79 bp premium.

Table 4: Combining overdelivery and sign asymmetry

	1m	**3m**	**6m**	**12m**
$\lvert MPS^{Over}_{c,t}\rvert$ for positive $MPS^{Over}_{c,t}$	0.898***	0.801***	0.812***	0.676***
	[0.15]	[0.14]	[0.16]	[0.17]
$\lvert MPS^{Over}_{c,t}\rvert$ for negative $MPS^{Over}_{c,t}$	1.058***	1.011***	1.070**	0.455***
	[0.40]	[0.39]	[0.43]	[0.07]
$\lvert MPS^{Under}_{c,t}\rvert$ for positive $MPS^{Under}_{c,t}$	0.029	0.080**	0.152	0.104
	[0.03]	[0.04]	[0.08]	[0.08]
$\lvert MPS^{Under}_{c,t}\rvert$ for negative $MPS^{Under}_{c,t}$	0.274***	0.242***	0.133	0.287***
	[0.08]	[0.06]	[0.14]	[0.10]
Diff *Over–Under* Pos.	0.869***	0.721***	0.660***	0.572***
	[0.15]	[0.14]	[0.18]	[0.18]
Diff *Over–Under* Neg.	0.785**	0.768**	0.937**	0.168
	[0.38]	[0.36]	[0.42]	[0.12]
R^2	0.28	0.27	0.28	0.18
Obs	2 064	2 214	1 968	2 210

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from an augmented specification of Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the Bloomberg-based monetary policy surprise decomposed into tightening and easing overdelivery and underdelivery components. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Importantly, the overdelivery premia for positive and negative surprises are statistically indistinguishable from each other across all short maturities. This rules out the possibility that our results capture sign asymmetries in monetary transmission. The overdelivery premium appears to be a distinct phenomenon that operates symmetrically for both tightening and easing decisions.

3.3 Robustness analysis

We provide several robustness checks to ensure the main finding is not driven by particular measurement choices, sample characteristics, or estimation procedures. Our results go through when using median instead of mean expectations from the Bloomberg survey (Appendix Table A2), and when we drop the 25% Bloomberg survey rounds with the smallest number of respondents (Appendix Table A3). Furthermore, results are robust when we differentiate the observations according to the dispersion of expectations (Appendix Table A4): the overdelivery premium is present both when dispersion (measured by the absolute mean-median distance) is high, i.e. above the 75th percentile, and when it is below this threshold. We also address potential concerns about the econometric specification related to structural difference across countries or time by including country and year fixed effects in Equation (2), about the error structure by clustering standard errors at different levels (time and country $\times$ time), and about the multiple decisions that are fully anticipated and the presence of zeros for the identification (Appendix Table A5). In all four cases, the overdelivery premium remains highly significant.

Appendix Table A6 assesses whether the overdelivery premium holds in the time-series dimension within individual countries or reflects cross-sectional variation across our 14-country panel. Knowing that this sort of test aggravates the small sample issue, we estimate our baseline specification separately for the euro area and the United States.[9] For the euro area, overdelivery surprises generate consistently larger responses than underdelivery surprises, even though only the coefficients for the 1-month response are statistically different. For the United States, overdelivery coefficients are consistently larger than underdelivery coefficients, too, though the differences are not statistically significant, possibly due to larger standard errors in the smaller country-specific sample. These results suggest that the overdelivery premium is not an artifact of pooling countries but reflects a more fundamental pattern that also emerges within individual economies. Appendix Table A7 reports results when we split the sample in September 2008, to test whether our findings are confined to the time before the global financial crisis, or also appear afterwards, when central banks expanded their toolkit by applying hitherto unconventional measures. We find evidence for an overdelivery premium in both subsamples, but a starker difference in the post 2008 sample.

Another potential concern is whether our results reflect the larger average magnitude of overdelivery surprises (13 bp) relative to underdelivery surprises (6 bp) documented in Table 2. We address this in two ways. First, we restrict the sample to exclude the largest overdelivery events (those exceeding two standard deviations of the overall sample), which equalizes the average magnitudes of the two types of surprises. Second, we standardize both surprise measures to have unit variance, ensuring that coefficients are directly comparable. Appendix Table A8 shows that the overdelivery premium holds under both approaches. This confirms that the asymmetric response reflects a qualitative difference in how investors interpret central bank decisions that exceed versus fall short of expectations, rather than a consequence of surprise magnitudes.

Appendix Table A9 verifies that extreme observations do not drive our results. When we exclude policy rate changes exceeding 75 bp in absolute value (which removes 24 observations) or when we instead exclude monetary surprises exceeding 75 bp in absolute value (removing 21 observations), the overdelivery premium remains sizable and significant. The consistency of these results indicates that our findings are not driven by crisis episodes or unusual policy actions.

[9] Appendix Table A6 also shows evidence of the overdelivery premium when excluding these two countries.

Appendix Table A10 explores whether the effects of overdelivery depend on whether the central bank changes rates or maintains the status quo. When we exclude all status quo decisions, overdelivery surprises continue to generate much stronger responses than underdelivery surprises. Also when we exclude observations where the market expected a status quo (i.e., where $\mathbb{E}_{t-j}[r_m] = r_{m-1}$), the overdelivery premium remains. These results confirm that the premium is not driven by the prevalence of status quo decisions in the underdelivery category. Does the overdelivery premium differ for "standard" 25 bp adjustments versus larger "unusual" adjustments? Appendix Table A11 splits the sample by the absolute size of the policy rate change. We find that the overdelivery premium exists for both standard (changes of 25 bp or less) and large adjustments (changes exceeding 25 bp).

To further clarify the role of status quo decisions, Appendix Table A12 explicitly separates three categories: overdelivery (decision and surprise move in same direction), a status quo decision when a rate change was expected (a special form of underdelivery), and underdelivery with actual policy change (decision and surprise move in opposite directions, excluding status quo). The overdelivery premium holds in both cases, confirming that exceeding expectations generates stronger effects. If the policy change and the surprise move in the opposite direction, we do not find any significant market reaction. This means that the small positive response of underdelivery surprises in the baseline case is driven by status quo decisions.

One interpretation of the overdelivery premium is that some decisions announce the launch of a new policy cycle (Hamilton and Jordà 2002). Appendix Table A13 investigates whether the overdelivery premium differs at the start of a new tightening or easing cycle versus during an ongoing cycle. Overdelivery surprises during ongoing cycles generate similar responses as those at the start of cycles. The differences are not statistically significant, indicating that the premium operates both when the central bank is initiating or within a policy cycle. In addition, Appendix Table A14 separates the sample by whether the policy decision occurs during a tightening or easing cycle. The overdelivery premium appears in both contexts, confirming that the phenomenon is not specific to one type of monetary policy cycle.

Another potential interpretation is that overdelivery surprises might signal a frontloading of a future policy action, thereby affecting expectations for subsequent meetings. In addition, Herbert et al. (2025) document that monetary surprises have fundamentally different effects on interest rates when surprises about the current policy stance ("Target surprises") and about the policy stance further ahead ("Path" surprises) have opposite signs, a phenomenon that could explain our results. To address this, Appendix Table A15 includes the change in 1-month-ahead policy rate expectations as an additional control variable. Even after controlling for revisions to next-month policy expectations (or alternatively for revisions to policy expectations three months out), the overdelivery premium remains sizable and significant and is not driven by differential effects on the expected path of future policy decisions.

3.4 Market-based monetary surprises

Bloomberg survey expectations can be updated until 17:00 the day before the policy announcement, which makes Bloomberg-based surprises informationally equivalent to standard monetary policy surprises at the daily frequency. However, they differ in another respect: they are forecast errors (the difference between the realized policy rate and the survey expectation) rather than

Table 5: Using market-based measures of *MPS*

	Daily OIS changes				Intraday MPS			
	1m	**3m**	**6m**	**12m**	**1m**	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$	0.707***	0.669***	0.613***	0.386***	0.999***	0.938***	0.815***	0.804***
	[0.13]	[0.10]	[0.11]	[0.08]	[0.13]	[0.12]	[0.13]	[0.09]
$MPS^{Under}_{c,t}$	0.331***	0.269***	0.319***	0.261**	0.472***	0.443***	0.484***	0.526***
	[0.05]	[0.06]	[0.05]	[0.12]	[0.13]	[0.10]	[0.12]	[0.13]
Diff *Over–Under*	0.376***	0.400***	0.293**	0.125	0.527***	0.495***	0.332	0.278
	[0.14]	[0.12]	[0.12]	[0.15]	[0.19]	[0.16]	[0.17]	[0.16]
R^2	0.14	0.17	0.15	0.05	0.10	0.11	0.09	0.09
Obs	1 726	1 858	1 651	1 878	1 141	1 236	1 236	1 301

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on daily changes in OIS rates as a measure of the monetary policy surprise (left panel) and on high-frequency intraday 30-min window monetary policy surprises from Emeksiz et al. (2026) (right panel) using the Bloomberg classification for overdelivery and underdelivery categories. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

changes in asset prices around the announcement, which is the usual practice in the literature. This distinction enables our classification of over- and underdelivery.

To ensure our results are not sensitive to the measurement of surprises, we construct two alternative surprise measures, but maintain our Bloomberg-based classification of over- versus underdelivery (since we need a clear benchmark for what the central bank was expected to do in terms of the actual policy instrument to determine whether the central bank exceeded or fell short of expectations). Table 5 shows the results. The left panel uses daily changes in short-maturity OIS rates (from 1 week to 1 month, depending on data availability in each country), and therefore captures market expectations formed before policy decisions. The right panel is based on the high-frequency intraday monetary policy surprises of Emeksiz et al. (2026), which are computed over a 30-min window around the policy announcement (but are not available for all of our countries and for the entire sample period). The high-frequency intraday market-based measures have two additional advantages. First, they capture expectations formed immediately before policy decisions, minimizing the window for information contamination (known as the pre-FOMC drift, see Lucca and Moench 2015). Second, the database of Emeksiz et al. (2026) provides *target* shocks (surprises to the current policy rate) which exclude by construction the potential influence of *path* shocks (surprises to the expected future policy path). For both market-based surprises, the results confirm our main findings. Overdelivery surprises generate larger responses than underdelivery surprises (even if we control for the path surprises, see Appendix Table A16).

3.5 High-frequency current-decision surprises

For the United States and the euro area, we can employ financial market data that allow us to further validate our findings using high-frequency intraday current-decision surprises, where both the classification of over/underdelivery and the measurement of the surprise come from intraday market-based data rather than surveys. For the United States, we use 30-minute changes in federal funds futures (FF1) around FOMC announcements. For the euro area, we use 30-minute changes in 1-week OIS rates around ECB announcements.

Table 6 presents results for both central banks using these high-frequency measures. For the United States, overdelivery surprises generate strong responses across the term structure of Eurodollar futures (ED1 through ED4, representing 3-month interest rate expectations at various

horizons) and Treasury yields. The overdelivery premium is particularly pronounced for ED2 through ED4 contracts and still holds at the 2-year maturity, but disappears at longer maturities. For the euro area, the pattern is similar but somewhat more muted. The overdelivery premium is 28 and 24 bp at the 3- and 6-month horizons, statistically significant at the 5% level, and vanishes at longer maturities.

Table 6: High-frequency current-decision surprises

					United States			
	ED1	**ED2**	**ED3**	**ED4**	**T2Y**	**T5Y**	**T10Y**	**SP500**
MPS_t^{Over}	0.939***	0.907***	0.891***	0.834***	0.561***	0.422***	0.254***	-3.123
	[0.15]	[0.16]	[0.15]	[0.16]	[0.08]	[0.10]	[0.09]	[2.26]
MPS_t^{Under}	0.719***	0.422**	0.226	0.143	0.139	0.067	0.008	-4.758**
	[0.14]	[0.17]	[0.22]	[0.26]	[0.20]	[0.17]	[0.11]	[1.92]
Diff *Over–Under*	0.220	0.485**	0.665**	0.691**	0.422**	0.355	0.246	1.635
	[0.21]	[0.24]	[0.27]	[0.31]	[0.21]	[0.20]	[0.14]	[2.96]
R^2	0.54	0.32	0.20	0.14	0.11	0.06	0.03	0.06
Obs	212	212	212	212	212	212	212	209
					Euro area			
	OIS1M	**OIS3M**	**OIS6M**	**OIS1Y**	**DE2Y**	**DE5Y**	**DE10Y**	**STOXX**
MPS_t^{Over}	0.862***	0.778***	0.616***	0.469***	0.289***	0.132	-0.005	-0.015***
	[0.08]	[0.07]	[0.09]	[0.11]	[0.10]	[0.07]	[0.04]	[0.00]
MPS_t^{Under}	0.667***	0.499***	0.380***	0.311***	0.251***	0.141**	-0.016	-0.031**
	[0.09]	[0.08]	[0.06]	[0.05]	[0.07]	[0.06]	[0.05]	[0.01]
Diff *Over–Under*	0.195	0.279**	0.236**	0.158	0.038	-0.010	0.011	0.016
	[0.12]	[0.11]	[0.11]	[0.12]	[0.12]	[0.09]	[0.06]	[0.01]
R^2	0.75	0.76	0.68	0.48	0.21	0.06	0.00	0.06
Obs	281	281	281	281	281	281	281	281

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) at the country level using OLS. The dependent variables are equivalent to those in the baseline specification. ED denotes Eurodollar futures rates, T stands for treasury yields. OIS denotes overnight index swap rates, DE stands for German government bond yields. These dependent variables are regressed on the overdelivery and underdelivery surprises, measured as the intraday change in current-month future contracts (FF1) for the United States and 1-week OIS rates for the euro area, and categorized as over- and underdelivery based on these intraday policy rate surprises (not the Bloomberg expectations). To do so, the "As expected" category is defined when policy rate surprises are smaller than half their standard deviation. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Because Eurodollar futures and OIS rates capture the expected policy rate at a specific future horizon, these results also clarify the nature of the yield curve's response. They document that the observed impact on medium-term (6-month to 1-year) maturities is not a mechanical effect of a change in the 1-month rate compounding across the curve via the expectations hypothesis. Instead, the significance of the overdelivery premium in the ED2–ED4 and 3- to 6-month OIS contracts confirms that overdelivery surprises directly affect investors' expectations of the policy rate trajectory at these specific horizons.

These high-frequency results are compelling because they address potential concerns about the timing of expectation formation and the measurement of surprises, although they are subject to a small sample issue. The fact that we find evidence of the overdelivery premium even when using 30-minute windows around policy announcements provides strong evidence that the phenomenon represents an actual difference in how investors process central bank decisions.

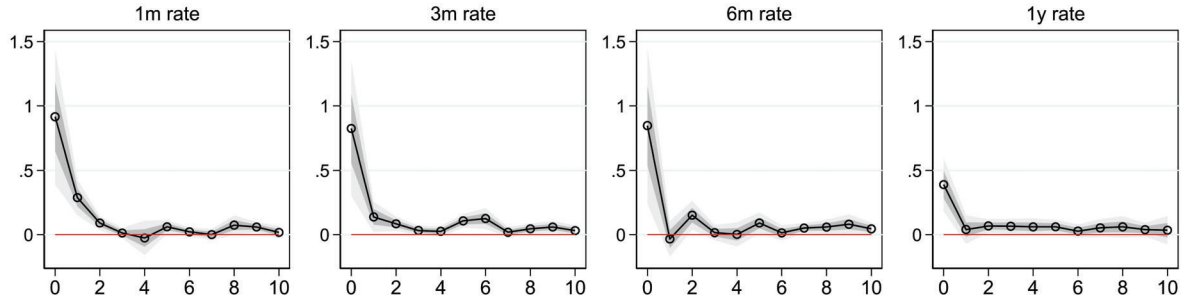
3.6 Persistence

Do the differential responses to over- and underdelivery surprises persist beyond the initial announcement, or do they quickly reverse as investors reassess the information content of policy decisions? To address this question, we estimate local projections extending the baseline specification of Equation 2 to horizons of 1 through 10 days after the announcement:

$$\Delta Y_{c,t+h} = \alpha_h + \beta_{O,h} MPS_{c,t}^{Over} + \beta_{U,h} MPS_{c,t}^{Under} + \epsilon_{c,t+h} \tag{3}$$

where $\Delta Y_{c,t+h}$ represents the daily change in asset prices on day $t+h$. Figure 3 plots the difference $\beta_{O,h} - \beta_{U,h}$ over horizons $h = 0, 1, \ldots, 10$. For the 1-month maturity, the overdelivery premium is 91 bp on impact, it still is significant at about 30 bp on day 1, and is close to zero (and mostly no longer statistically significant) through day 10. Similar patterns emerge for 3-, 6-, and 12-month maturities: sharp initial effects followed by small and largely insignificant effects subsequently. As these local projections are not cumulative, this implies that the overdelivery premium is not reversed over the subsequent 10 trading days.

Figure 3: Effect over 10 days



Note: These figures show the dynamic effects on 1-month to 12-month interest rates over 10 days for the difference $\beta_O - \beta_U$ estimated with Equation (3). Shaded areas represent 68% and 95% confidence intervals.

Importantly, we observe no reversal of the initial overdelivery premium. If investors were systematically overreacting to overdelivery surprises and then correcting this overreaction, we would expect the difference to turn negative. Instead, the premium remains positive or null throughout the 10-day window, suggesting that the differential response reflects information rather than a temporary behavioral bias that markets subsequently unwind.

4 Signals about policymakers' views of the state of the economy

One potential explanation for the overdelivery premium is that over- and underdelivery surprises carry different information about the central bank's assessment of economic conditions. A growing literature documents that monetary policy announcements can convey "central bank information effects", namely when policy decisions reveal the central bank's views about the state of the economy, leading investors to revise their macroeconomic forecasts in ways that can either reinforce or offset the standard channel of monetary transmission. In the classic example of Ellingsen and Söderström (2001) and subsequent work by Nakamura and Steinsson (2018) and Jarociński and Karadi (2020), an unexpected rate hike could lead investors to infer that the central bank perceives stronger economic conditions than previously believed, prompting upward revisions to

growth and inflation forecasts. This, in turn, could then prompt beliefs about a future endogenous monetary policy response, i.e. a further increase in future interest rates.

If central bank information effects explain the overdelivery premium, we should observe differential patterns in how macroeconomic forecasts respond to over- versus underdelivery surprises. Specifically, for overdelivery tightening surprises (the central bank raising rates by more than expected), information effects would manifest as upward revisions to inflation forecasts and downward revisions to unemployment forecasts, the opposite of what standard monetary transmission would predict, but in line with the overdelivery premiun, i.e. the stronger interest rate responsiveness documented above. For underdelivery tightening surprises, we would expect forecast revisions consistent with standard monetary policy effects: lower inflation and higher unemployment expectations.

4.1 Do monetary surprises affect macro forecast revisions?

To test for central bank information effects, we examine how professional forecasters revise their macroeconomic projections following monetary policy announcements. We estimate specifications similar to our baseline asset price regressions:

$$\Delta F^X_{c,t} = \alpha + \beta\, MPS_{c,t} + \gamma_{year} + \epsilon_{c,t} \tag{4}$$

$$\Delta F^X_{c,t} = \alpha + \beta_O\, MPS^{Over}_{c,t} + \beta_U\, MPS^{Under}_{c,t} + \gamma_{year} + \epsilon_{c,t} \tag{5}$$

where $\Delta F^X_{c,t}$ represents the revision to forecasts of variable X (inflation, unemployment or GDP growth) in country c following the monetary policy decision at time t. We use two sources of forecast data to capture both short-term and medium-term expectation revisions. For near-term forecasts (nowcasts), we employ Bloomberg survey data, which polls professional forecasters about upcoming macroeconomic data releases. These surveys are conducted in the days before the subsequent data release (equivalently to the survey that defines our monetary policy surprises). For longer-horizon forecasts, we use Consensus Economics data, which provides monthly forecasts for current-calendar-year (CY) and next-calendar-year (NY) inflation, unemployment and GDP growth. From these, we furthermore construct 1-year-ahead (1Y) forecasets following Dovern et al. (2012). Because macroeconomic forecast revisions exhibit strong cyclical patterns with business cycles (the Great Financial Crisis of 2008-2009, the Covid crisis of 2020, the inflation surge of 2021-2022) common to all countries, we include year fixed effects (γ_{year}) in Equations (4) and (5).

We match the forecasts to monetary policy decisions based on survey response deadlines. For each policy meeting, we compute the change in forecasts as the difference between the first survey conducted after the meeting and the last survey conducted before the meeting. Our forecast revision sample spans the same countries and time period as our baseline asset price analysis, subject to data availability. Bloomberg nowcast data are available for 1 719 to 1 859 observations depending on the variable, while Consensus Economics data are available for 1 284 to 1 789 observations.

Table 7 presents results for inflation and unemployment forecast revisions. The upper panel shows that standard monetary policy surprises (without distinguishing over- from underdelivery) generate positive and significant revisions to inflation forecasts across all horizons (left panel) and small and mostly insignificant revisions to unemployment forecasts: the effect on the nowcast

is significant at the 1% level but disappears at longer horizons. A one percentage point tightening surprise leads to an 0.83 percentage point upward revision in the inflation nowcast and 0.51 percentage points for 1-year-ahead inflation.

This positive relationship between tightening surprises and inflation forecast revisions is consistent with central bank information effects: in response to a tightening surprise, forecasters infer that policymakers perceive greater inflation pressure than markets had recognized, leading to upward rather than downward revisions to inflation expectations. This pattern aligns with the findings of Nakamura and Steinsson (2018) for the United States, but has been challenged by Bauer and Swanson (2023) who document that the omission of recent macroeconomic news generate this positive relationship, an issue we will come back to later.

Table 7: Macroeconomic forecast responses to monetary surprises

	CPI inflation				Unemployment			
	Nowcast	CY	1Y	NY	Nowcast	CY	1Y	NY
$MPS_{c,t}$	0.832***	0.631***	0.506***	0.310**	-0.146***	-0.164	-0.121	-0.107
	[0.14]	[0.20]	[0.09]	[0.15]	[0.05]	[0.12]	[0.06]	[0.08]
R^2	0.15	0.04	0.20	0.01	0.02	0.04	0.09	0.06
Obs	1 859	1 789	1 789	1 789	1 719	1 284	1 284	1 284
	CPI inflation				Unemployment			
	Nowcast	CY	1Y	NY	Nowcast	CY	1Y	NY
$MPS^{Over}_{c,t}$	1.093***	1.035***	0.747***	0.529***	-0.258***	-0.417**	-0.321***	-0.379***
	[0.16]	[0.30]	[0.09]	[0.19]	[0.06]	[0.19]	[0.06]	[0.08]
$MPS^{Under}_{c,t}$	-0.269	-0.427	-0.127	-0.266**	0.242	0.235	0.193**	0.320**
	[0.34]	[0.26]	[0.10]	[0.12]	[0.16]	[0.14]	[0.10]	[0.15]
Diff *Over–Under*	1.362***	1.462***	0.874***	0.796***	-0.501***	-0.652***	-0.514***	-0.699***
	[0.39]	[0.42]	[0.14]	[0.24]	[0.18]	[0.24]	[0.12]	[0.17]
R^2	0.15	0.04	0.22	0.01	0.02	0.05	0.09	0.07
Obs	1 859	1 789	1 789	1 789	1 719	1 284	1 284	1 284

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equations (4) and (5) using OLS. The dependent variable is the revision in the indicated macroeconomic forecast at different horizons (Nowcast, Current Year, 1 Year ahead, Next Year) for country c at date t, regressed on the (overdelivery and underdelivery) Bloomberg-based monetary policy surprises. The constant and year fixed effects are not reported. The differences in the number of observations across columns are determined by the availability of survey data.

When we distinguish over- from underdelivery, a clear pattern emerges for both inflation and unemployment forecast revisions. Overdelivery tightening surprises generate large and highly significant upward revisions to inflation forecasts (0.75 percentage points for 1-year-ahead forecasts for instance) and lead to significant downward revisions in unemployment forecasts (-0.32 percentage points for 1-year-ahead forecasts). These revisions are inconsistent with standard monetary transmission, which would predict that unexpected tightening raises unemployment, but consistent with information effects: forecasters infer from the central bank's aggressive action that policymakers view inflationary pressures and labor market conditions as stronger than previously believed.

In stark contrast, underdelivery tightening surprises produce forecast revisions that i) are smaller, ii) have the opposite sign, and iii) usually only appear for longer forecast horizons: we find a negative effect on inflation forecasts (significant for next-year forecasts) and a positive effect on unemployment forecasts (significant for 1-year and next-year forecasts). These coefficients for

underdelivery are consistent with standard monetary transmission: tightening monetary policy leads, after some time, to lower inflation and higher unemployment.[10]

The differences between overdelivery and underdelivery effects are large and significant across all forecast horizons for the different macroeconomic variables. For next-year inflation forecasts, arguably the most policy-relevant horizon, a one percentage point overdelivery tightening surprise raises inflation expectations by 0.53 percentage points, while a same-sized underdelivery tightening surprise produces a -0.27 percentage point revision. This provides compelling evidence that overdelivery surprises may trigger central bank information effects.

4.2 Addressing a potential omitted variable bias

To provide additional validation and address concerns about a potential omitted variable bias, we replicate our analysis using US data that allow us to control for macroeconomic data releases. Bauer and Swanson (2023) demonstrate that controlling for same-day macroeconomic news is crucial for isolating pure monetary policy effects on forecasts, since policy announcements sometimes coincide with important economic data releases that could independently affect expectations.

Table 8 presents results for the United States using the methodology and data from Bauer and Swanson (2023) (where we also remove the eight most influential observations driving Fed information effects according to their Figure 1). The upper left panel shows that their standard monetary policy surprises, based on high-frequency federal funds and Eurodollar futures changes, have no significant effect on 1-year-ahead inflation or unemployment forecasts when we do not control for macroeconomic releases (although the point estimates have signs that are consistent with information effects). The upper right panel adds controls for recent macroeconomic data surprises using Bauer and Swanson (2023)'s series. With these controls, monetary surprises continue to show no significant effects on macro forecasts (with both point estimates now having signs consistent with the standard monetary policy channel), confirming that FOMC surprises do not systematically convey information effects once we account for economic news. These results corroborate their main finding.

However, when we distinguish between overdelivery and underdelivery surprises (lower panels), a striking pattern emerges. Without macroeconomic controls, overdelivery surprises generate large and significant forecast revisions: 2.85 percentage points for inflation and -0.99 percentage points for unemployment, with the sign of the revision being consistent with information effects. Underdelivery surprises produce opposite-signed and insignificant revisions. The difference in the effects of over- and underdelivery surprises is sizable and significant at the 1 and 5% level respectively.

These differential effects persist even after controlling for macroeconomic data releases. With Bauer-Swanson controls, overdelivery surprises do not trigger forecast revisions of unemployment, but they continue to generate sizable forecast revisions for inflation (1.22 percentage points, significant at the 5% level), consistent with information effects. Underdelivery surprises produce revisions of -1.44 percentage points for inflation (significant at the 1% level) and 1.60 percentage points for unemployment (significant at the 5% level), both consistent with standard monetary

[10] Appendix Table A17 presents results for GDP growth forecasts, showing an equivalent pattern: overdelivery tightening surprises lead to upward revisions in GDP forecasts, while underdelivery tightening surprises generate downward revisions, and vice versa for easing surprises.

Table 8: Focusing on US data and controlling for macro releases

	No controls		w/ BS23's macro releases	
	CPI_{1Y}	$Unemp_{1Y}$	CPI_{1Y}	$Unemp_{1Y}$
MPS_t	0.796	-0.249	-0.109	0.618
	[0.86]	[0.41]	[0.41]	[0.37]
R^2	0.03	0.00	0.49	0.43
Obs	149	149	149	149
	No controls		w/ BS23's macro releases	
	CPI_{1Y}	$Unemp_{1Y}$	CPI_{1Y}	$Unemp_{1Y}$
MPS_t^{Over}	2.846***	-0.986**	1.215**	0.620
	[1.02]	[0.47]	[0.57]	[0.52]
MPS_t^{Under}	-1.048	1.438	-1.439***	1.601**
	[0.90]	[1.01]	[0.45]	[0.67]
Diff *Over–Under*	3.894***	-2.424**	2.654***	-0.981
	[1.35]	[1.12]	[0.75]	[0.80]
R^2	0.18	0.05	0.53	0.45
Obs	149	149	149	149

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (4) and (5) at the country level using OLS. The dependent variable is the revision in the indicated macroeconomic forecast at the 1-year horizon, regressed on Bauer and Swanson (2023)'s monetary policy surprises (in the lower panel categorized as over- and underdelivery using the Bloomberg-based classification). Both equations are augmented with the set of Bauer and Swanson (2023)'s macroeconomic data surprises in the right panel. The constant is not reported.

transmission. The differences in the effect of the two same-magnitude surprises are large (and highly statistically significant for inflation).

These US results demonstrate that the overdelivery premium in forecast revisions is not an artifact of omitted macroeconomic news. Even when we account for recent economic data releases, overdelivery FOMC decisions continue to generate inflation forecast responses consistent with information effects, while underdelivery decisions generate responses consistent with standard monetary policy. This supports our interpretation that overdelivery provides signals about the central bank's economic assessment, while underdelivery is processed as a standard policy shock. Equivalent results are obtained when we control for macroeconomic surprises in our full panel setting using Bloomberg macro surveys, see Appendix Table A18.

This evidence also helps reconcile the findings in the central bank information literature. Bauer and Swanson (2023) conclude that monetary policy surprises do not exhibit systematic information effects. By pooling overdelivery surprises (which do exhibit information effects) with underdelivery surprises (which do not), information effects can no longer identified, even if such effects are present, but restricted to overdelivery episodes.

4.3 Macro forecast revisions and asset price responses

The previous evidence suggests an apparent puzzle. Overdelivery surprises generate large interest rate responses and forecast revisions which are consistent with central bank information effects: higher inflation forecasts and lower unemployment forecasts following tightening overdelivery surprises. Yet, Table 3 shows that neither overdelivery nor underdelivery surprises produce significant stock price responses. The absence of stock price reactions despite overdelivery signaling a stronger economy is puzzling.

This apparent contradiction reflects two offsetting channels operating simultaneously. When an overdelivery surprise conveys information that the economy is stronger than anticipated, this generates a positive *cash flow effect*: higher expected growth increases expected future earnings. Simultaneously, this same information triggers expectations of tighter future policy to contain inflationary pressures, generating a negative *discount rate effect*. For stock prices, these two forces can offset each other, resulting in muted responses even when information effects are strong. For interest rates, both channels push in the same direction, namely towards higher interest rates, explaining the strong response of short-term interest rates. Vandeweyer et al. (2026) provide direct evidence of this dual-channel mechanism using dual-listed stocks, showing that monetary surprises operate simultaneously through discount rate and cash flow effects. Our results are consistent with their decomposition and add a new dimension: the balance between these two channels depends on whether the central bank over- or underdelivers, which explains why overdelivery surprises leave stock prices largely unchanged despite generating large interest rate responses at the short end of the yield curve (1-month to 1-year maturities in Table 3).

To formalize this intuition, we adopt the discrete decomposition of Jarociński and Karadi (2020), classifying monetary policy surprises based on their co-movement with stock prices. A negative covariance indicates "monetary policy-dominated" surprises where discount rate effects prevail. A positive covariance indicates "central bank information-dominated" surprises where information about economic conditions dominates the discount rate effect.

Table 9: MP news vs. CB information effects

	1m	**3m**	**6m**	**12m**	**2y**	**5y**	**10y**	**Stock**
$MPS^{Over}_{c,t}$ MP-dom	1.234***	1.251***	1.278***	0.498***	0.352***	0.213***	0.195***	-4.653***
	[0.43]	[0.42]	[0.48]	[0.08]	[0.06]	[0.04]	[0.03]	[0.58]
$MPS^{Over}_{c,t}$ CBI-dom	0.722***	0.528***	0.595***	0.575***	0.277***	0.158***	0.121***	4.561***
	[0.16]	[0.13]	[0.15]	[0.14]	[0.04]	[0.04]	[0.03]	[0.58]
$MPS^{Under}_{c,t}$ MP-dom	0.213***	0.291***	0.166	0.333***	0.377***	0.326***	0.193**	-7.075***
	[0.07]	[0.06]	[0.12]	[0.10]	[0.11]	[0.08]	[0.08]	[0.85]
$MPS^{Under}_{c,t}$ CBI-dom	0.040	0.051**	0.128**	0.060	0.081	0.118	0.089	5.145***
	[0.03]	[0.02]	[0.05]	[0.06]	[0.07]	[0.08]	[0.06]	[1.19]
Diff *Over–Under* MP-dom	1.022**	0.960**	1.112**	0.166	-0.025	-0.112	0.002	2.422**
	[0.44]	[0.42]	[0.49]	[0.13]	[0.13]	[0.09]	[0.08]	[1.03]
Diff *Over–Under* CBI-dom	0.683***	0.477***	0.467***	0.515***	0.196**	0.039	0.032	-0.584
	[0.16]	[0.13]	[0.16]	[0.15]	[0.09]	[0.08]	[0.07]	[1.32]
R^2	0.30	0.30	0.31	0.18	0.09	0.03	0.03	0.12
Obs	2 064	2 214	1 968	2 210	2 259	2 381	2 381	2 378

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. Whether a policy decision is classified as dominated by pure monetary policy and central bank information effects follows the discrete decomposition ("poor's man approach") of Jarociński and Karadi (2020). The differences in the number of observations across columns are determined by the availability of asset price data.

Table 9 applies this decomposition to our over/underdelivery categories. For monetary policy-dominated overdelivery surprises ($MPS^{Over}_{c,t}$ MP-dom), interest rate responses are very large: 1.23, 1.25, and 1.28 percentage points at 1-, 3-, and 6-month maturities (with strongly negative stock price effects by construction). For information-dominated overdelivery ($MPS^{Over}_{c,t}$ CBI-dom), interest rate responses are much smaller 0.72, 0.53, and 0.60 percentage points (with positive stock price effects by construction).

These results refine our understanding of information effects. When monetary policy surprises and stock prices exhibit negative covariance (the monetary policy-dominated case), this can reflect either: (1) a strong monetary policy shock with weak or absent central bank information effects, or (2) strong central bank information effects accompanied by strong signals about the endogenous policy response to those economic conditions. In the second configuration, investors update their beliefs about economic fundamentals (generating the cash flow effect) but simultaneously anticipate a tighter policy response (generating an even stronger discount rate effect), resulting in net negative stock price responses. When monetary policy surprises and stock prices exhibit positive covariance (the information effect-dominated case), this indicates strong central bank information signals but also signals about a weak expected future endogenous policy response. Investors update their economic outlook, but expect only a muted policy response, allowing cash flow effects to dominate. The evidence suggests overdelivery surprises typically convey strong information effects and the endogenous policy response to these conditions generates the asset price responses evidenced in Table 3.

5 Revisions to the perceived central bank reaction function

An alternative explanation for the overdelivery premium is that investors interpret over- and underdelivery surprises as signals about the central bank's reaction functions, the systematic relationship between policy rates and macroeconomic conditions (see the recent literature on perceived reaction functions, e.g., Bauer et al. 2024, Bocola et al. 2024, Gauthier 2026, Sutherland 2026). If overdelivery indicates a more aggressive stance toward inflation or output stabilization, or reveals new information about the neutral rate, investors would revise their expectations of future policy accordingly, generating larger interest rate responses.

5.1 Estimating perceived central bank reaction function parameters

To test this channel, we follow the methodology of Bauer et al. (2024) to estimate perceived central bank reaction function parameters from survey data. The approach exploits cross-sectional variation in professional forecasters' expectations to infer the policy rule that market participants believe the central bank is following. Specifically, for each country c and month t, we estimate the following cross-sectional regression across individual forecasters i:

$$\mathbb{E}_{i,c,t}[r_{c,t+h_1}] = \phi_{c,t} + \phi^{\pi}_{c,t}\,\mathbb{E}_{i,c,t}[\pi_{c,t+h_2}] + \phi^{y}_{c,t}\,\mathbb{E}_{i,c,t}[y_{c,t+h_2}] + \epsilon_{i,c,t} \tag{6}$$

where $\mathbb{E}_{i,c,t}[r_{c,t+h_1}]$ is forecaster i's expectation of the policy rate at horizon h_1, $\mathbb{E}_{i,c,t}[\pi_{c,t+h_2}]$ and $\mathbb{E}_{i,c,t}[y_{c,t+h_2}]$ are their inflation and output forecasts at horizon h_2, and $\phi_{c,t}$, $\phi^{\pi}_{c,t}$ and $\phi^{y}_{c,t}$ represent the perceived intercept, inflation response coefficient, and output response coefficient of the central bank's reaction function.

We implement this approach using Consensus Economics Forecasts, which provide monthly survey data on inflation, GDP growth, and interest rate expectations from professional forecasters across our sample countries. Our baseline specification uses 1-year-ahead inflation and GDP forecasts (constructed as weighted averages of current-year and next-year forecasts following Dovern et al. 2012) to predict 3-month-ahead policy rate expectations. For comparison, we plot in Appendix Figure A3 our measure of the perceived inflation response in the United States together

with the one of Bauer et al. (2024) using Blue Chip expectations. Because of the potential small sample of survey respondents in some countries, as a robustness test, we estimate an alternative version of Equation 4 in which we pool current and next year horizons of macroeconomic forecasts and 3-month and 12-month interest rate forecasts of each individual. This combination of horizons balances the need for sufficient variation with a relevant representation of the central bank reaction function.

The estimated parameters $\{\hat{\phi}_{c,t}, \hat{\phi}^{\pi}_{c,t}, \hat{\phi}^{y}_{c,t}\}$ provide time-varying measures of how market participants perceive the central bank's policy rule. Changes in $\hat{\phi}^{\pi}_{c,t}$ or $\hat{\phi}^{y}_{c,t}$ would indicate revisions to beliefs about the central bank's responsiveness to inflation or output conditions. Changes in $\hat{\phi}_{c,t}$ could reflect updates about the neutral rate.

We supplement this analysis with a measure of perceived policy inertia and estimate:

$$\mathbb{E}_{i,c,t}[r_{c,t+12m}] = \alpha_{c,t} + \rho_{c,t}\,\mathbb{E}_{i,c,t}[r_{c,t+3m}] + \epsilon_{i,c,t} \tag{7}$$

where $\rho_{c,t}$ captures the degree of perceived policy persistence or interest rate smoothing. A higher $\rho_{c,t}$ indicates that forecasters expect policy rates to adjust gradually over time, while a lower value suggests expectations of more rapid policy adjustments. Our sample for this analysis spans 1999 (or first availability) through 2023 and includes all countries in our baseline sample except Iceland, for which Consensus Economics data are not available to us. We match each month's estimated reaction function parameters to monetary policy decisions based on the survey response deadline, ensuring that the parameter estimates reflect beliefs formed before the policy announcement.

5.2 Do monetary surprises affect the perceived reaction function?

To test whether monetary policy surprises lead investors to revise their beliefs about central bank reaction functions, we estimate the following specification:

$$\Delta\hat{\phi}^{j}_{c,t} = \alpha + \beta\, MPS_{c,t} + \epsilon_{c,t} \tag{8}$$

where $\Delta\hat{\phi}^{j}_{c,t}$ represents the change in the estimated perceived reaction function parameter $j \in \{\text{constant}, \pi, y, \rho\}$ from month $t-1$ to month t, and $MPS_{c,t}$ is the monetary policy surprise. We then extend Equation 6 to distinguish between overdelivery and underdelivery surprises:

$$\Delta\hat{\phi}^{j}_{c,t} = \alpha + \beta_O\, MPS^{Over}_{c,t} + \beta_U\, MPS^{Under}_{c,t} + \epsilon_{c,t} \tag{9}$$

Table 10 presents the results. The upper panel shows that standard monetary policy surprises (without distinguishing over- from underdelivery) have no significant effect on the perceived inflation response coefficient ($\hat{\phi}^{\pi}$) or output response coefficient ($\hat{\phi}^{y}$). The point estimates are small and statistically insignificant: -0.13 for inflation and -0.22 for output when using 1-year-ahead forecasts. Similarly, surprises do not significantly affect the perceived inertia parameter $\hat{\rho}$.

However, monetary surprises do lead to significant revisions in the estimated intercept ($\hat{\phi}$): a one percentage point surprise increases the intercept by 1.28 percentage points when using 1-year-ahead forecasts, and by 0.69 when pooling current-year and next-year forecast horizons. This

suggests that investors interpret monetary surprises primarily as conveying information about the appropriate level of policy rates, potentially reflecting revisions to beliefs about factors shifting the entire policy rule (perceptions about the inflation target, for instance), rather than about the central bank's cyclical responsiveness.

The lower panel of Table 10 distinguishes between overdelivery and underdelivery surprises. The pattern for the inflation and output response coefficients remains unchanged: neither type of surprise generates significant revisions to $\hat{\phi}^{\pi}$ or $\hat{\phi}^{y}$. The differences between overdelivery and underdelivery effects are also statistically insignificant. For the intercept $\hat{\phi}$, however, overdelivery surprises generate significant revisions: 2.16 percentage points using 1-year-ahead forecasts, and 1.21 percentage points when pooling forecast horizons. In contrast, underdelivery surprises produce smaller and insignificant intercept revisions. The difference between overdelivery and underdelivery effects is 2.47 percentage points for 1-year-ahead forecasts and 1.45 percentage points for pooled horizons, both significant at the 1% level.

Table 10: Changes in perceived reaction function parameters

	1Y horizon			CY & NY horizons pooled			Inertia
	Inflation	GDP	constant	Inflation	GDP	constant	3m-1y
$MPS_{c,t}$	-0.131	-0.223	1.278***	0.083	-0.093	0.691***	-0.141
	[0.12]	[0.15]	[0.43]	[0.06]	[0.10]	[0.26]	[0.20]
R^2	0.00	0.00	0.003	0.00	0.00	0.005	0.00
Obs	1 754	1 754	1 754	1 757	1 757	1 757	1 754
	1Y horizon			CY & NY horizons pooled			Inertia
	Inflation	GDP	constant	Inflation	GDP	constant	3m-1y
$MPS_{c,t}^{Over}$	-0.071	-0.362	2.155***	0.133	-0.128	1.206***	-0.194
	[0.16]	[0.22]	[0.58]	[0.08]	[0.14]	[0.34]	[0.27]
$MPS_{c,t}^{Under}$	-0.242	0.030	-0.315	-0.009	-0.030	-0.244	-0.044
	[0.17]	[0.15]	[0.60]	[0.10]	[0.12]	[0.41]	[0.26]
Diff *Over–Under*	0.171	-0.392	2.471***	0.143	-0.098	1.450***	-0.150
	[0.23]	[0.27]	[0.84]	[0.13]	[0.19]	[0.53]	[0.37]
R^2	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Obs	1 754	1 754	1 754	1 757	1 757	1 757	1 754

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (8) and (9) using OLS. The dependent variable is the change in the perceived inflation and output responsiveness or perceived constant (estimated with Equation 6) or smoothing parameter (estimated with Equation 7) in country c at date t, regressed on the (overdelivery and underdelivery) Bloomberg-based monetary policy surprises. The constant is not reported.

If investors interpreted overdelivery as a signal by the central bank that it would respond more aggressively to inflation going forward, we would expect to see increases in $\hat{\phi}^{\pi}$. Similarly, if overdelivery indicated greater concern about output stabilization, $\hat{\phi}^{y}$ should increase.[11]

The fact that investors do not differentially revise their beliefs about the central bank's responsiveness to inflation or output suggests that the overdelivery premium does not primarily operate through learning about the systematic component of monetary policy. Rather than about how aggressively the central bank will respond to economic developments, overdelivery appears to convey information about the level of appropriate policy, consistent with signals about the central bank's assessment of current economic conditions.

[11] These findings also hold when differentiating expansions from recessions and high from low inflation regimes and when allowing for dynamic effects.

6 Over- and underdelivery for macroeconomic news

Although the earlier evidence suggests that central bank information effects play a role in generating the overdelivery premium, a behavioral explanation could also account for our findings: reference-dependent preferences. If investors evaluate outcomes relative to a reference point, in our case their prior expectations, they might systematically overreact when realized values exceed the reference point but underreact when realized values fall short.

This concept, formalized in prospect theory (Kahneman and Tversky 1979) and the subsequent behavioral economics literature, posits that individuals experience utility gains and losses relative to expectations rather than in absolute terms.[12] Applied to our setting, investors might interpret overdelivery surprises as generating larger "surprise" than underdelivery surprises of equivalent magnitude. This psychological asymmetry could produce differential market reactions even in the absence of any informational differences between over- and underdelivery.

To distinguish between the information effect channel and the reference-dependent preferences channel, we conduct a placebo test using macroeconomic data releases. If reference-dependent utility is a key characteristic of how investors process economic news, we should observe a similar overdelivery premium for macroeconomic surprises: data releases that exceed expectations by more than the change in the indicator (analogous to monetary overdelivery surprises) should generate larger market responses than releases that fall short of expectations. Conversely, if the overdelivery premium is specific to monetary policy, reflecting the unique informational content of central bank decisions, we should find no such asymmetry for macroeconomic data releases.

6.1 Constructing macroeconomic over/underdelivery surprises

We construct measures of over- and underdelivery for macroeconomic data releases using the same conceptual framework we applied to monetary policy decisions. Let X_m denote the realized value of a macroeconomic indicator at month m announced at day t, $\mathbb{E}_{t-j}[X_m]$ denote the market expectation formed at time $t-j$, and X_{m-1} denote the previous release of the indicator. The change in the indicator is $\Delta X_m = X_m - X_{m-1}$, and the expected change is $\mathbb{E}_{t-j}[\Delta X_m] = \mathbb{E}_{t-j}[X_m] - r_{X-1}$.

We define overdelivery and underdelivery surprises in analogy to our monetary policy classification: overdelivery occurs when the change in the indicator exceeds what markets had expected, while underdelivery occurs when the actual change falls short of the expected change:[13]

$$Macro_t^{Over} = \begin{cases} X_m - \mathbb{E}_{t-j}[X_m] & \text{if } \left(\Delta X_m > \mathbb{E}_{t-j}[\Delta X_m] \geq 0\right) \vee \left(\Delta X_m < \mathbb{E}_{t-j}[\Delta X_m] \leq 0\right) \\ 0 & \text{otherwise} \end{cases}$$

$$Macro_t^{Under} = \begin{cases} X_m - \mathbb{E}_{t-j}[X_m] & \text{if } \left(\mathbb{E}_{t-j}[\Delta X_m] > \Delta X_m \geq 0\right) \vee \left(\mathbb{E}_{t-j}[\Delta X_m] < \Delta X_m \leq 0\right) \\ 0 & \text{otherwise} \end{cases}$$

[12] Santoro et al. (2014) develop a structural model in which households display reference-dependent preferences to account for asymmetries in the transmission of monetary policy. Pinter and Picault (2026) document that market disappointment (when policy falls short of what markets *preferred*) leads to stock price declines via a sentiment channel.

[13] Unlike monetary policy announcements, we cannot exclude the possibility that actual and expected changes have opposite signs. To remain consistent with monetary surprises, we exclude these ambiguous cases from our sample.

We implement this approach using the Bloomberg survey data that we already employed for constructing the monetary policy surprises. The survey covers also other major macroeconomic releases, of which we study: consumer price index (CPI) inflation, industrial production (IP) growth, unemployment rates, and GDP growth. We then estimate specifications similar to our baseline monetary policy regressions:

$$\Delta Y_{c,t} = \alpha + \beta_O \, Macro_{c,t}^{Over} + \beta_U \, Macro_{c,t}^{Under} + \epsilon_{c,t} \tag{10}$$

where $\Delta Y_{c,t}$ represents the daily change in interest rates in country c on the day of the macroeconomic release at time t. Our sample includes all available Bloomberg survey data for the various macroeconomic releases across our 14 countries from 1997 through 2023, yielding between 822 and 3 091 observations depending on the macroeconomic release and interest rate maturity. To ensure comparability across different releases and countries, we follow Andersen et al. (2003) and normalize all surprises by their country- and announcement-specific standard deviation. This way, our coefficients capture the market response to standardized surprise magnitudes rather than raw basis point or percentage point deviations.

6.2 The effect of macroeconomic news

Table 11 presents results for CPI inflation and industrial production surprises. The upper panel shows that standard CPI surprises, without distinguishing over- from underdelivery, generate positive and significant responses in interest rates at medium and longer maturities. A one-standard-deviation positive inflation surprise (indicating higher-than-expected inflation) increases 5-year rates by 1.3 basis points. Industrial production surprises show a similar pattern, with positive surprises (stronger-than-expected production) raising interest rates significantly at most maturities. This pattern aligns with standard asset pricing responses to inflation or output news: higher-than-expected inflation or output leads investors to anticipate tighter monetary policy going forward, raising nominal interest rates across the term structure.

Each panel of Table 11 also tests whether these macroeconomic surprises exhibit an overdelivery premium analogous to what we found for monetary policy. The differences between overdelivery and underdelivery effects are statistically insignificant at all maturities for both inflation and industrial production surprises. In addition, they lack any consistent pattern as some of the point estimates are positive, others negative.

Appendix Table A19 presents equivalent results for unemployment and GDP surprises. As was the case for CPI inflation and industrial production, we find no evidence of an overdelivery premium. This stands in contrast to our monetary policy results, where overdelivery surprises generated systematically and significantly larger responses across all short maturities.

The absence of an overdelivery premium for macroeconomic data releases provides compelling evidence against reference-dependent preferences as an explanation for the main result of this paper. It suggests that the overdelivery premium reflects something specific to central bank decisions rather than a feature of how investors process economic information. This interpretation is strengthened by the fact that macroeconomic data releases share many features with monetary policy announcements. Both types of events are widely anticipated, heavily surveyed, and have clear benchmark expectations that could serve as reference points. Both types generate signifi-

Table 11: Macroeconomic data surprises

	Inflation surprises						
	1m	3m	6m	1y	2y	5y	10y
CPI surprises$_{c,t}$	0.001	0.002	0.005***	0.007***	0.011***	0.013***	0.009***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.000	0.000	0.006	0.009	0.034	0.060	0.034
Obs	2 535	2 958	2 767	2 804	2 981	3 091	3 079
	1m	3m	6m	1y	2y	5y	10y
CPI surprises$^{Over}_{c,t}$	0.002	0.002	0.005**	0.006***	0.010***	0.013***	0.010***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
CPI surprises$^{Under}_{c,t}$	-0.000	0.000	0.007***	0.009***	0.011***	0.013***	0.008***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Diff *Over–Under*	0.002	0.002	-0.002	-0.003	-0.001	0.001	0.001
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.000	0.001	0.006	0.009	0.034	0.060	0.034
Obs	2 535	2 958	2 767	2 804	2 981	3 091	3 079
	Industrial production surprises						
	1m	3m	6m	1y	2y	5y	10y
IP surprises$_{c,t}$	0.002	0.005***	0.005***	0.006***	0.005***	0.004***	0.004***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.000	0.003	0.003	0.006	0.007	0.006	0.006
Obs	1 920	1 920	1 920	1 936	1 929	1 936	1 926
	1m	3m	6m	1y	2y	5y	10y
IP surprises$^{Over}_{c,t}$	0.002	0.006**	0.005**	0.007***	0.005***	0.004***	0.004***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
IP surprises$^{Under}_{c,t}$	0.001	0.004	0.004	0.004	0.005**	0.004**	0.003
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Diff *Over–Under*	0.001	0.002	0.001	0.004	-0.001	0.000	0.000
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.000	0.003	0.003	0.007	0.007	0.006	0.006
Obs	1 920	1 920	1 920	1 936	1 929	1 936	1 926

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (10) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the (overdelivery and underdelivery) components of the macroeconomic data surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

cant immediate market reactions. And both types are released on predetermined schedules with limited scope for timing an announcement strategically.

That the overdelivery premium only applies to monetary policy announcements points toward the central bank information effects channel. Monetary policy decisions are unique in that they reflect not just mechanical responses to observed data but also the policymakers' interpretation of economic conditions, their forecasts of future developments, and their judgment about appropriate policy in the face of uncertainty. When a central bank overdelivers, it reveals information about all these dimensions, providing a richer signal than a simple data release about one economic variable.

Finally, these results have implications for understanding the broader literature on asset price responses to macroeconomic news. Andersen et al. (2003), Gürkaynak et al. (2005b), and Faust et al. (2007) documents that inflation, employment, and production surprises move asset prices in predictable ways, with responses that vary by maturity in patterns consistent with their impli-

cations for monetary policy. Our findings complement this literature by showing that these data surprises operate through standard information channels rather than behavioral asymmetries, and that the over- vs. underdelivery distinction matters uniquely for central bank announcements.

7 Conclusion

This paper documents a novel asymmetry in monetary policy transmission: when central banks exceed market expectations, what we call "overdelivery", investors respond more strongly than when policy decisions fall short of expectations. Using Bloomberg survey data to classify over 2 300 monetary policy decisions across 14 advanced economies from 1997 to 2023, we find that overdelivery surprises generate interest rate responses up to ten times larger than underdelivery surprises of equivalent magnitude at short maturities. This "overdelivery premium" is large, statistically robust, and distinct from previously documented asymmetries related to the sign or size of policy changes.

We explore three potential explanations for this premium: central bank information effects, revisions to perceived central bank reaction functions, and reference-dependent preferences. The evidence points toward central bank information effects. Overdelivery surprises lead professional forecasters to revise their macroeconomic expectations in directions consistent with learning about the central bank's information, raising inflation forecasts and lowering unemployment forecasts following tightening overdelivery, contrary to standard monetary transmission. Underdelivery surprises, in contrast, generate forecast revisions consistent with conventional monetary policy effects. Crucially, we find no similar overdelivery premium for macroeconomic data releases, ruling out general behavioral explanations such as reference-dependent utility and confirming that the asymmetry is specific to monetary policy announcements.

The key to understanding this asymmetry lies in the signal extraction problem facing investors. Overdelivery provides a clear signal: for a central bank to exceed expectations despite institutional preferences for gradualism and predictability, economic conditions must justify more aggressive action, and policymakers must have confidence in that assessment. Underdelivery, by contrast, is fundamentally ambiguous: it could reflect uncertainty about the economy, preferences for policy smoothing, internal committee disagreement, or institutional caution. This multiplicity of interpretations creates a signal extraction problem that limits the information investors can extract from underdelivery decisions, explaining why these surprises generate much weaker market responses even if they have comparable magnitudes.

These findings have important implications for monetary policy strategy and communication. Overdelivery generates strong market effects but may trigger undesirable expectation dynamics. More broadly, our analysis contributes to understanding when and why central bank information effects arise, showing that the clarity embedded in overdelivery decisions make them particularly potent signals about policymakers' views of economic fundamentals. In addition, the overdelivery premium suggests that the standard high-frequency identification approach, which treats all surprises of the same magnitude equally, may actually confound two different types of shocks.

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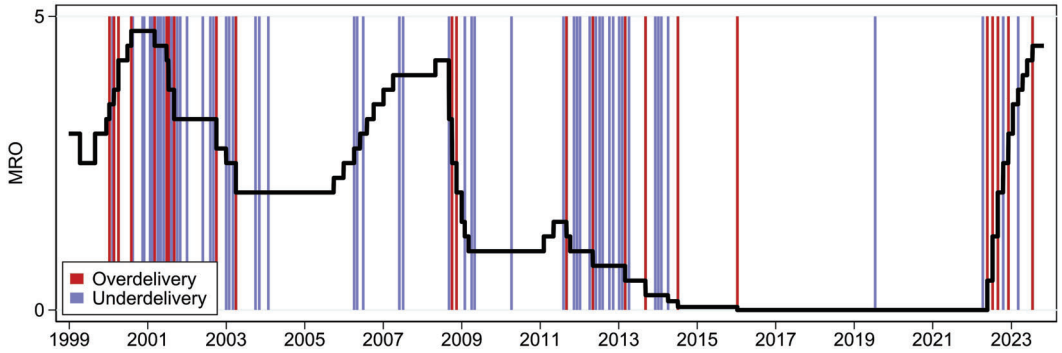
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APPENDIX
For online publication

Figure A1: Over/underdelivery ECB policy rate decisions



Note: This figure displays the distribution of over- (red bars) and underdelivery (blue bars) monetary policy surprises over time in the euro area. The black line plots the Main Refinancing Operations (MRO) rate in percentage points.

Table A1: Number of respondents and over-/underdelivery occurrences by country

Country	Avg Nb. Resp.	Overdelivery	Underdelivery
Australia	28	32	39
Canada	26	38	30
Czech Republic	17	33	24
Euro area	46	23	57
Iceland	6	14	12
Israel	16	57	64
Japan	36	2	17
Norway	18	39	35
New Zealand	16	35	30
South Korea	18	27	58
Sweden	20	37	22
Switzerland	21	7	16
United Kingdom	46	40	49
USA	83	35	27
Total	32	419	480

Note: The table shows the average number of survey respondents and the number of overdelivery and underdelivery surprises in each country.

Table A2: Median Bloomberg survey expectations

	1m	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$	0.792***	0.776***	0.843***	0.441***
	[0.24]	[0.25]	[0.28]	[0.06]
$MPS^{Under}_{c,t}$	0.051	0.069**	0.118	0.096
	[0.03]	[0.03]	[0.06]	[0.06]
Diff *Over–Under*	0.741***	0.707***	0.726**	0.345***
	[0.25]	[0.25]	[0.29]	[0.08]
R^2	0.22	0.22	0.24	0.14
Obs	2 064	2 214	1 968	2 210
	2y	**5y**	**10y**	**Stock**
$MPS^{Over}_{c,t}$	0.289***	0.182***	0.151***	-0.623
	[0.04]	[0.02]	[0.02]	[0.51]
$MPS^{Under}_{c,t}$	0.151	0.150**	0.075	-0.133
	[0.08]	[0.07]	[0.04]	[0.75]
Diff *Over–Under*	0.138	0.032	0.076	-0.489
	[0.09]	[0.07]	[0.05]	[0.90]
R^2	0.08	0.03	0.02	0.00
Obs	2 259	2 381	2 381	2 378

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A3: Excluding low number of respondents

	1m	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$	0.625***	0.646***	0.603***	0.582***
	[0.12]	[0.09]	[0.11]	[0.10]
$MPS^{Under}_{c,t}$	0.258***	0.280***	0.196	0.341***
	[0.07]	[0.06]	[0.11]	[0.07]
Diff *Over–Under*	0.367***	0.366***	0.407***	0.240
	[0.14]	[0.11]	[0.15]	[0.13]
R^2	0.20	0.25	0.21	0.19
Obs	1 564	1 682	1 572	1 743

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A4: Dispersion of survey expectations

	1m	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$ | Low Disp.	0.696***	0.630***	0.737***	0.462***
	[0.13]	[0.10]	[0.11]	[0.10]
$MPS^{Over}_{c,t}$ | High Disp.	1.401**	1.313**	1.273**	0.624***
	[0.59]	[0.54]	[0.59]	[0.17]
$MPS^{Under}_{c,t}$ | Low Disp.	0.211**	0.235***	0.357***	0.298**
	[0.09]	[0.07]	[0.10]	[0.12]
$MPS^{Under}_{c,t}$ | High Disp.	0.048**	0.083**	0.005	0.087
	[0.02]	[0.03]	[0.09]	[0.07]
Diff *Over–Under* | Low Disp.	0.485***	0.394***	0.379**	0.165
	[0.16]	[0.12]	[0.16]	[0.15]
Diff *Over–Under* | High Disp.	1.354**	1.230**	1.269**	0.537***
	[0.59]	[0.54]	[0.60]	[0.19]
R^2	0.33	0.32	0.32	0.24
Obs	718	784	652	774

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A5: Alternative econometric specifications

	1m	3m	6m	12m
	Adding country and year fixed effects			
$MPS^{Over}_{c,t}$	0.973***	0.924***	0.974***	0.520***
	[0.26]	[0.26]	[0.29]	[0.08]
$MPS^{Under}_{c,t}$	0.109***	0.140***	0.155	0.146**
	[0.04]	[0.05]	[0.08]	[0.07]
Diff *Over–Under*	0.864***	0.784***	0.819***	0.373***
	[0.26]	[0.26]	[0.31]	[0.11]
R^2	0.31	0.30	0.31	0.20
Obs	2 064	2 214	1 968	2 210
	SE clustered at the year level			
$MPS^{Over}_{c,t}$	1.003***	0.944***	0.993***	0.536***
	[0.27]	[0.27]	[0.33]	[0.08]
$MPS^{Under}_{c,t}$	0.089	0.122***	0.148**	0.147**
	[0.04]	[0.04]	[0.07]	[0.07]
Diff *Over–Under*	0.914***	0.822***	0.845**	0.389***
	[0.29]	[0.28]	[0.36]	[0.11]
R^2	0.28	0.26	0.28	0.18
Obs	2 064	2 214	1 968	2 210
	SE clustered at the year and country levels			
$MPS^{Over}_{c,t}$	1.003**	0.944**	0.993**	0.536***
	[0.36]	[0.33]	[0.36]	[0.14]
$MPS^{Under}_{c,t}$	0.089	0.122***	0.148	0.147
	[0.05]	[0.03]	[0.07]	[0.09]
Diff *Over–Under*	0.914**	0.822**	0.845	0.389**
	[0.39]	[0.35]	[0.42]	[0.16]
R^2	0.28	0.26	0.28	0.18
Obs	2 064	2 214	1 968	2 210
	Excluding zero MPS			
$MPS^{Over}_{c,t}$	1.004***	0.946***	0.992***	0.536***
	[0.27]	[0.26]	[0.30]	[0.08]
$MPS^{Under}_{c,t}$	0.087**	0.119***	0.149**	0.147**
	[0.04]	[0.04]	[0.07]	[0.07]
Diff *Over–Under*	0.917***	0.827***	0.844***	0.389***
	[0.27]	[0.27]	[0.31]	[0.11]
R^2	0.31	0.29	0.31	0.26
Obs	761	828	689	814

Note: Robust (first and fourth panels) and clustered (second and third panels) standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant and the country and year fixed effects (for the first panel) are not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A6: Individual estimates for EA/US and all countries except those

	1m	**3m**	**6m**	**12m**
	Euro area			
$MPS^{Over}_{EA,t}$	0.554***	0.388***	0.389***	0.284***
	[0.11]	[0.07]	[0.08]	[0.09]
$MPS^{Under}_{EA,t}$	0.074	0.202**	0.237**	0.268**
	[0.10]	[0.09]	[0.09]	[0.13]
Diff *Over–Under*	0.480***	0.186	0.152	0.016
	[0.15]	[0.12]	[0.12]	[0.16]
R^2	0.46	0.24	0.24	0.10
Obs	282	282	282	282
	United States			
$MPS^{Over}_{US,t}$	0.349**	0.662***	0.127	0.280**
	[0.17]	[0.25]	[0.10]	[0.14]
$MPS^{Under}_{US,t}$	0.218	0.155	-0.005	0.234
	[0.21]	[0.10]	[0.10]	[0.13]
Diff *Over–Under*	0.132	0.507	0.132	0.046
	[0.26]	[0.27]	[0.14]	[0.19]
R^2	0.03	0.12	0.01	0.06
Obs	213	213	213	213
	All countries except EA/US			
$MPS^{Over}_{c,t}$	1.061***	0.993***	1.070***	0.570***
	[0.29]	[0.29]	[0.33]	[0.09]
$MPS^{Under}_{c,t}$	0.085**	0.117***	0.147	0.136
	[0.04]	[0.04]	[0.08]	[0.07]
Diff *Over–Under*	0.975***	0.876***	0.923***	0.434***
	[0.29]	[0.29]	[0.34]	[0.11]
R^2	0.29	0.28	0.30	0.19
Obs	1 569	1 719	1 473	1 715

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A7: Pre/Post 2008

	1m	**3m**	**6m**	**12m**
	Pre 2008			
$MPS^{Over}_{c,t}$	0.524***	0.430***	0.381***	0.426***
	[0.07]	[0.08]	[0.05]	[0.05]
$MPS^{Under}_{c,t}$	0.049	0.080**	-0.035	0.042
	[0.03]	[0.03]	[0.17]	[0.07]
Diff *Over–Under*	0.474***	0.351***	0.416**	0.383***
	[0.07]	[0.09]	[0.18]	[0.09]
R^2	0.35	0.19	0.18	0.18
Obs	607	661	576	610
	Post 2008			
$MPS^{Over}_{c,t}$	1.189***	1.123***	1.198***	0.584***
	[0.36]	[0.35]	[0.39]	[0.11]
$MPS^{Under}_{c,t}$	0.150**	0.186***	0.217***	0.308***
	[0.06]	[0.06]	[0.07]	[0.07]
Diff *Over–Under*	1.039***	0.937***	0.981**	0.276**
	[0.36]	[0.35]	[0.40]	[0.13]
R^2	0.30	0.30	0.32	0.18
Obs	1 457	1 553	1 392	1 600

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A8: Tackling size difference in surprises

	1m	**3m**	**6m**	**12m**
	Excluding large $MPS^{Over}_{c,t}$			
$MPS^{Over}_{c,t}$	1.015***	0.686***	0.645***	0.510***
	[0.20]	[0.14]	[0.19]	[0.13]
$MPS^{Under}_{c,t}$	0.090***	0.123***	0.149**	0.148**
	[0.03]	[0.04]	[0.07]	[0.07]
Diff *Over–Under*	0.925***	0.563***	0.496**	0.361**
	[0.20]	[0.15]	[0.20]	[0.15]
R^2	0.09	0.07	0.05	0.04
Obs	1 936	2 072	1 851	2 084
	Standardized monetary surprises			
$MPS^{Over}_{c,t}$	0.178***	0.168***	0.176***	0.095***
	[0.05]	[0.05]	[0.05]	[0.01]
$MPS^{Under}_{c,t}$	0.010***	0.013***	0.015**	0.016**
	[0.00]	[0.00]	[0.01]	[0.01]
Diff *Over–Under*	0.168***	0.155***	0.160***	0.079***
	[0.05]	[0.05]	[0.05]	[0.02]
R^2	0.28	0.26	0.27	0.17
Obs	2 064	2 214	1 968	2 210

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. In the upper panel, we truncate the $MPS^{Over}_{c,t}$ distribution to get an average magnitude of 0.06 (by removing values outside 2 SD of the overall sample) to match the distribution of $MPS^{Under}_{c,t}$. In the lower panel, we normalize both monetary surprises to have 1-unit SD. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A9: Excluding outliers in the policy rate change and *MPS*

	1m	**3m**	**6m**	**12m**
	Excl. policy change outliers: <-75bp or >75bp			
$MPS^{Over}_{c,t}$	0.647***	0.529***	0.549***	0.444***
	[0.06]	[0.05]	[0.05]	[0.04]
$MPS^{Under}_{c,t}$	0.095***	0.127***	0.159**	0.148**
	[0.04]	[0.04]	[0.07]	[0.07]
Diff *Over–Under*	0.552***	0.402***	0.390***	0.296***
	[0.07]	[0.07]	[0.08]	[0.08]
R^2	0.19	0.18	0.18	0.13
Obs	2 041	2 188	1 943	2 190
	Excl. MPS outliers: <-75bp or >75bp			
$MPS^{Over}_{c,t}$	0.794***	0.716***	0.773***	0.564***
	[0.09]	[0.09]	[0.09]	[0.08]
$MPS^{Under}_{c,t}$	0.141***	0.195***	0.148**	0.290***
	[0.05]	[0.04]	[0.07]	[0.06]
Diff *Over–Under*	0.652***	0.521***	0.625***	0.274***
	[0.11]	[0.10]	[0.11]	[0.10]
R^2	0.25	0.24	0.27	0.19
Obs	2 060	2 209	1 965	2 207

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A10: Excluding (expected) status quo decisions

	1m	**3m**	**6m**	**12m**
	Excluding status quo decisions			
$MPS^{Over}_{c,t}$	1.010***	0.949***	0.993***	0.537***
	[0.26]	[0.26]	[0.30]	[0.08]
$MPS^{Under}_{c,t}$	-0.073	0.076	0.156	0.067
	[0.06]	[0.08]	[0.13]	[0.17]
Diff *Over–Under*	1.083***	0.873***	0.836**	0.470**
	[0.27]	[0.27]	[0.33]	[0.19]
R^2	0.31	0.29	0.31	0.27
Obs	512	575	489	545
	Excluding expected status quo decisions			
$MPS^{Over}_{c,t}$	1.092***	1.013***	1.083***	0.536***
	[0.31]	[0.30]	[0.35]	[0.09]
$MPS^{Under}_{c,t}$	0.084**	0.118***	0.144**	0.148**
	[0.04]	[0.04]	[0.07]	[0.07]
Diff *Over–Under*	1.009***	0.895***	0.939***	0.389***
	[0.31]	[0.31]	[0.35]	[0.12]
R^2	0.31	0.28	0.31	0.22
Obs	848	932	786	911

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A11: Differentiating the magnitude of policy rate changes

	1m	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$ | $\lvert\Delta r_t\rvert \leq$25 bp	0.606***	0.528***	0.577***	0.423***
	[0.06]	[0.05]	[0.05]	[0.05]
$MPS^{Over}_{c,t}$ | $\lvert\Delta r_t\rvert >$25 bp	1.206***	1.143***	1.160***	0.611***
	[0.39]	[0.38]	[0.42]	[0.13]
$MPS^{Under}_{c,t}$ | $\lvert\Delta r_t\rvert \leq$25 bp	0.107***	0.122***	0.154**	0.129
	[0.04]	[0.04]	[0.07]	[0.07]
$MPS^{Under}_{c,t}$ | $\lvert\Delta r_t\rvert >$25 bp	-0.368	0.103	0.065	0.616***
	[0.31]	[0.31]	[0.25]	[0.22]
Diff *Over–Under* | $\lvert\Delta r_t\rvert \leq$25 bp	0.499***	0.406***	0.423***	0.294***
	[0.07]	[0.06]	[0.09]	[0.08]
Diff *Over–Under* | $\lvert\Delta r_t\rvert >$25 bp	1.574***	1.041**	1.095**	-0.005
	[0.50]	[0.49]	[0.49]	[0.25]
R^2	0.30	0.29	0.30	0.18
Obs	2 064	2 214	1 968	2 210

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A12: Same vs. opposite directions (isolating status quo)

	1m	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$	1.003***	0.944***	0.993***	0.536***
	[0.27]	[0.26]	[0.30]	[0.08]
$MPS^{SQ}_{c,t}$	0.143***	0.136***	0.147	0.176***
	[0.05]	[0.04]	[0.08]	[0.07]
$MPS^{Under}_{c,t}$	-0.062	0.083	0.156	0.068
	[0.06]	[0.08]	[0.13]	[0.17]
Diff *Over–Under*	1.065***	0.862***	0.837**	0.468**
	[0.27]	[0.28]	[0.33]	[0.18]
Diff *Over–SQ*	0.861***	0.808***	0.846***	0.360***
	[0.27]	[0.27]	[0.31]	[0.10]
Diff *SQ–Under*	0.205***	0.053	-0.009	0.108
	[0.08]	[0.09]	[0.15]	[0.18]
R^2	0.28	0.26	0.28	0.18
Obs	2 064	2 214	1 968	2 210

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises, where the latter are split into underdelivery cases where an interest rate change was expected but not delivered ($MPS^{SQ}_{c,t}$) and the remaining cases. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A13: The overdelivery premium at the start/during a cycle

	1m	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$ Ongoing	1.073***	0.990***	1.029***	0.509***
	[0.34]	[0.33]	[0.37]	[0.10]
$MPS^{Over}_{c,t}$ Start	0.767***	0.772***	0.837***	0.622***
	[0.16]	[0.20]	[0.18]	[0.09]
$MPS^{Under}_{c,t}$	0.089**	0.122***	0.148**	0.147**
	[0.03]	[0.04]	[0.07]	[0.07]
Diff *Over* Ongoing–Start	0.306	0.217	0.193	-0.113
	[0.37]	[0.38]	[0.41]	[0.13]
R^2	0.28	0.27	0.28	0.18
Obs	2 064	2 214	1 968	2 210

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery monetary policy surprises during a monetary policy cycle ($MPS^{Over}_{c,t}$ Ongoing) and at the start of a cycle ($MPS^{Over}_{c,t}$ Start) and on the underdelivery monetary policy surprises($MPS^{Under}_{c,t}$). The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A14: The overdelivery premium in tightening vs. easing cycles

	1m	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$ Easing	1.056***	0.999***	1.050**	0.455***
	[0.39]	[0.38]	[0.42]	[0.07]
$MPS^{Over}_{c,t}$ Tightening	0.893***	0.817***	0.848***	0.685***
	[0.16]	[0.14]	[0.17]	[0.17]
$MPS^{Under}_{c,t}$ Easing	0.048	0.101**	0.193**	0.109
	[0.03]	[0.05]	[0.08]	[0.08]
$MPS^{Under}_{c,t}$ Tightening	0.201***	0.177***	0.082	0.263***
	[0.07]	[0.05]	[0.12]	[0.10]
Diff *Over–Under* Easing	1.008**	0.899**	0.857	0.345***
	[0.40]	[0.39]	[0.45]	[0.10]
Diff *Over–Under* Tightening	0.691***	0.640***	0.766***	0.422**
	[0.18]	[0.16]	[0.21]	[0.20]
R^2	0.28	0.27	0.28	0.18
Obs	2 064	2 214	1 968	2 210

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises, separately for easing and tightening cycles. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A15: Next decision frontloaded:
Controlling for policy expectations over next-month and 3-month ahead

	1m	**3m**	**6m**	**12m**
		Next month ahead		
$MPS^{Over}_{c,t}$	.	0.245**	0.301***	0.339***
		[0.10]	[0.10]	[0.06]
$MPS^{Under}_{c,t}$	.	0.048	0.027	0.091
		[0.03]	[0.07]	[0.06]
$\Delta rate_{1m}$	.	0.748***	0.686***	0.299***
		[0.16]	[0.18]	[0.08]
Diff *Over–Under*	.	0.197**	0.274**	0.248***
		[0.09]	[0.11]	[0.09]
R^2	.	0.65	0.62	0.26
Obs	.	2 064	1 818	2 025
		3-month ahead		
$MPS^{Over}_{c,t}$	.	.	0.174**	0.289***
			[0.08]	[0.06]
$MPS^{Under}_{c,t}$	.	.	-0.023	0.073
			[0.06]	[0.06]
$\Delta rate_{3m}$	.	.	0.767***	0.402***
			[0.11]	[0.09]
Diff *Over–Under*	.	.	0.197**	0.216***
			[0.09]	[0.08]
R^2	.	.	0.73	0.30
Obs	.	.	1 968	2 043

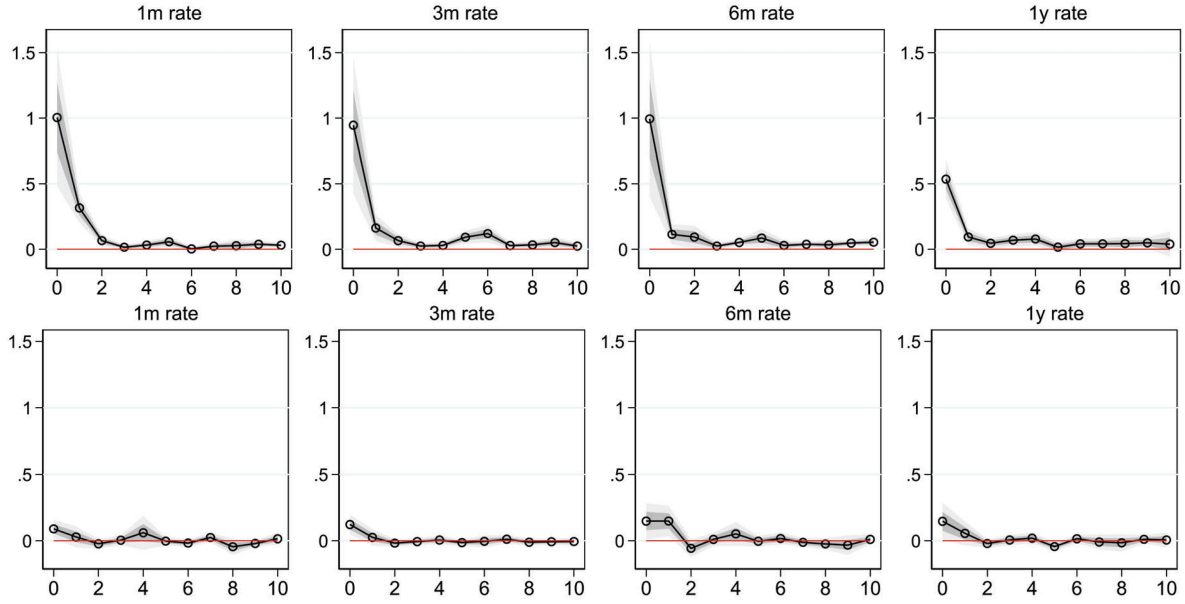
Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. Changes in 1-month (upper panel) and 3-month (lower panel) interest rates are added as a control. The differences in the number of observations across columns are determined by the availability of asset price data.

Table A16: Controlling for path surprises

	1m	**3m**	**6m**	**12m**
$MPS^{Over}_{c,t}$	0.999***	0.939***	0.815***	0.807***
	[0.13]	[0.12]	[0.13]	[0.09]
$MPS^{Under}_{c,t}$	0.474***	0.445***	0.481***	0.504***
	[0.14]	[0.10]	[0.12]	[0.12]
$Path_{c,t}$	-0.024	-0.041	0.053	0.406**
	[0.19]	[0.17]	[0.17]	[0.17]
Diff *Over–Under*	0.525***	0.493***	0.334	0.303**
	[0.19]	[0.16]	[0.18]	[0.15]
R^2	0.10	0.11	0.09	0.12
Obs	1 141	1 236	1 236	1 301

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (2) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the overdelivery ($MPS^{Over}_{c,t}$) and underdelivery ($MPS^{Under}_{c,t}$) monetary policy surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.

Figure A2: Persistence



Note: These figures show the dynamic effects on 1-month to 12-month interest rates over 10 days for β_O (upper panel) and β_U (lower panel) estimated with Equation (3). Shaded areas represent 68% and 95% confidence intervals.

Table A17: GDP forecast responses to monetary surprises

	Nowcast	CY	1Y	NY
$MPS_{c,t}$	-2.183	0.625	0.368	-0.403
	[1.32]	[0.38]	[0.19]	[0.23]
R^2	0.01	0.02	0.14	0.03
Obs	902	1 789	1 789	1 789
	Nowcast	CY	1Y	NY
$MPS^{Over}_{c,t}$	-0.812	1.223**	0.655**	-0.535
	[1.42]	[0.53]	[0.26]	[0.33]
$MPS^{Under}_{c,t}$	-5.588	-0.941***	-0.384**	-0.058
	[3.53]	[0.35]	[0.17]	[0.16]
Diff *Over–Under*	4.776	2.164***	1.039***	-0.477
	[4.05]	[0.67]	[0.32]	[0.38]
R^2	0.01	0.03	0.15	0.04
Obs	902	1 789	1 789	1 789

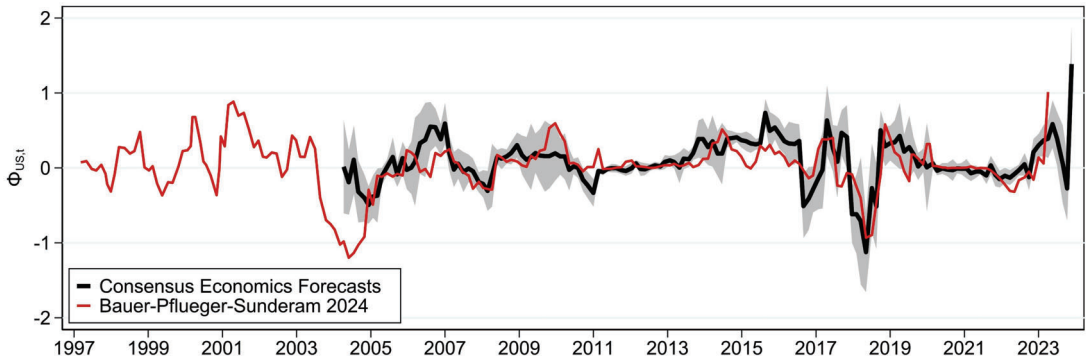
Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equations (4) and (5) using OLS. The dependent variable is the revision in GDP growth forecast at different horizons (Nowcast, Current Year, 1 Year ahead, Next Year) for country c at date t, regressed on the (overdelivery and underdelivery) Bloomberg-based monetary policy surprises. The constant and year fixed effects are not reported. The differences in the number of observations across columns are determined by the availability of survey data.

Table A18: Macro forecast responses - Controlling for macro data releases

	CPI inflation				Unemployment			
	Nowcast	CY	1Y	NY	Nowcast	CY	1Y	NY
$MPS_{c,t}$	0.701***	0.571***	0.472***	0.304**	-0.124**	-0.144	-0.120	-0.104
	[0.13]	[0.19]	[0.09]	[0.15]	[0.06]	[0.11]	[0.06]	[0.08]
R^2	0.22	0.05	0.24	0.01	0.13	0.06	0.12	0.08
Obs	1 859	1 789	1 789	1 789	1 719	1 284	1 284	1 284
	CPI inflation				Unemployment			
	Nowcast	CY	1Y	NY	Nowcast	CY	1Y	NY
$MPS^{Over}_{c,t}$	0.916***	0.945***	0.696***	0.526***	-0.204***	-0.373**	-0.304***	-0.361***
	[0.15]	[0.28]	[0.09]	[0.19]	[0.06]	[0.17]	[0.06]	[0.08]
$MPS^{Under}_{c,t}$	-0.195	-0.400	-0.108	-0.271**	0.149	0.214	0.167	0.298**
	[0.33]	[0.26]	[0.10]	[0.12]	[0.16]	[0.14]	[0.09]	[0.15]
Diff *Over–Under*	1.112***	1.344***	0.804***	0.796***	-0.353	-0.587**	-0.471***	-0.660***
	[0.38]	[0.41]	[0.14]	[0.24]	[0.18]	[0.23]	[0.11]	[0.17]
R^2	0.23	0.06	0.25	0.02	0.13	0.06	0.12	0.09
Obs	1 859	1 789	1 789	1 789	1 719	1 284	1 284	1 284

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equations (4) and (5) using OLS. The dependent variable is the revision in the indicated macroeconomic forecast at different horizons (Nowcast, Current Year, 1 Year ahead, Next Year) for country c at date t, regressed on the (overdelivery and underdelivery) Bloomberg-based monetary policy surprises. The constant and year fixed effects are not reported. The differences in the number of observations across columns are determined by the availability of survey data.

Figure A3: Perceived inflation coefficient in the United States



Note: This figure plots the comparison of our measure of perceived inflation responsiveness coefficient (black line with 95% confidence interval) for the United States across time estimated with Equation (6) together with the equivalent measure from Bauer et al. (2024).

Table A19: Over/Underdelivery for macroeconomic news

	GDP surprises						
	1m	3m	6m	1y	2y	5y	10y
GDP surprises$_{c,t}$	-0.002	-0.001	-0.001	0.004**	0.005**	0.004***	0.003**
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.001	0.000	0.000	0.005	0.008	0.007	0.005
Obs	822	928	909	959	1 031	1 047	1 046
	1m	3m	6m	1y	2y	5y	10y
GDP surprises$^{Over}_{c,t}$	-0.000	0.000	0.000	0.006***	0.006**	0.004	0.004**
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
GDP surprises$^{Under}_{c,t}$	-0.004	-0.003	-0.003	0.001	0.003	0.005**	0.003
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Diff *Over–Under*	0.004	0.003	0.004	0.005	0.003	-0.001	0.001
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.002	0.001	0.001	0.008	0.009	0.007	0.005
Obs	822	928	909	959	1 031	1 047	1 046
	Unemployment surprises						
	1m	3m	6m	1y	2y	5y	10y
Unemployment surprises$_{c,t}$	0.001	0.001	-0.000	-0.000	-0.002**	-0.002***	-0.002**
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.000	0.000	0.000	0.000	0.001	0.002	0.001
Obs	2 271	2 531	2 505	2 722	2 852	2 852	2 852
	1m	3m	6m	1y	2y	5y	10y
Unemployment surprises$^{Over}_{c,t}$	0.004	0.004	0.001	0.002	-0.003	-0.003**	-0.003
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Unemployment surprises$^{Under}_{c,t}$	-0.000	-0.000	-0.001	-0.002	-0.001	-0.002**	-0.001
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Diff *Over–Under*	0.004	0.004	0.002	0.004	-0.002	-0.001	-0.001
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.001	0.001	0.000	0.001	0.001	0.002	0.001
Obs	2 271	2 531	2 505	2 722	2 852	2 852	2 852

Note: Robust standard errors in brackets. * p < 0.1, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation (10) using OLS. The dependent variable is the daily change in the indicated asset price for country c on date t, regressed on the (overdelivery and underdelivery) components of the macroeconomic data surprises. The constant is not reported. The differences in the number of observations across columns are determined by the availability of asset price data.