



EUROPEAN CENTRAL BANK

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NO 868 / FEBRUARY 2008

PURDAH

**ON THE RATIONALE FOR
CENTRAL BANK SILENCE
AROUND POLICY
MEETINGS**

by Michael Ehrmann
and Marcel Fratzscher

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Michael Ehrmann
and Marcel Fratzscher²



In 2008 all ECB publications feature a motif taken from the €10 banknote.



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² Both authors: European Central Bank, Kaiserstrasse 29, 60311 Frankfurt am Main, Germany; e-mail: Michael.Ehrmann@ecb.int, Marcel.Fratzcher@ecb.int

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Address

Kaiserstrasse 29
60311 Frankfurt am Main, Germany

Postal address

Postfach 16 03 19
60066 Frankfurt am Main, Germany

Telephone

+49 69 1344 0

Website

<http://www.ecb.europa.eu>

Fax

+49 69 1344 6000

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CONTENTS

Abstract	4
Non-technical summary	5
1 Introduction	6
2 Institutional Design of the Purdah Period	8
3 Measuring Communication	10
4 Purdah communication and financial market reactions	11
5 Conclusions	15
References	16
Appendix A: Quotes from FOMC transcripts	18
Appendix B: Measuring central bank communication	20
Appendix C: Quotes of statements by FOMC members reported during the purdah	21
Tables and figures	30
European Central Bank Working Paper Series	35

Abstract

Despite substantial differences in monetary policy and communication strategies, many central banks share the practice of *purdah*, a self-imposed guideline of abstaining from communication around policy meetings or other important events. This practice is remarkable, as it seems to contradict the virtue of transparency by requiring central banks to withhold information precisely when it is sought after intensely. However, imposing such a limit to communication has often been justified on grounds that such communication may create excessive market volatility and unnecessary speculation. This short paper assesses the *purdah* for the Federal Reserve. The empirical results confirm the conjecture that financial markets are substantially more sensitive to central bank communication around policy meetings. Short-term interest rates react three to four times more strongly to statements in the *purdah* before FOMC meetings than during other times, and market volatility increases (compared to a volatility reduction induced by statements otherwise). The findings thus offer relevant insights about the limits to central bank transparency.

JEL classification: E58, E52, E43.

Keywords: *purdah*; communication; transparency; monetary policy; interest rates; effectiveness; Federal Reserve.

Non-technical summary

Central banks around the globe are pursuing not only different policy objectives, but they also have in place vastly different strategies of conveying policy and communicating with the public. Despite these differences, however, there is one element that most central banks share, at least among advanced economies. This element is the *purdah*, the practice of a self-imposed, voluntary guideline to abstain from communicating in the period around monetary policy decisions and other important events. The existence of such a practice is remarkable in several ways. At first sight, it seems to contradict the virtue of transparency which has become the hallmark of virtually all progressive central banks today, as it requires withholding information from the public when such information is sought after intensely and would likely affect financial markets substantially.

Why then do central banks pursue such a policy? Remarkably little official information about this practice is provided by central banks, partly reflecting the fact that the *purdah* is mostly not an official rule but a voluntary guideline, created by the members of the policy-setting committees themselves. The information that is available on this practice indicates that an important rationale for the *purdah* is the fear that communication just before policy meetings or other important events may create excessive market volatility and unnecessary speculation.

The paper assesses this issue for the Federal Reserve, for which a *purdah* has been in place at least since the early 1980s, nowadays for the 7 days before and 3 days after Federal Open Market Committee (FOMC) meetings, as well as before the Chairman's semi-annual testimony to Congress. For our empirical analysis, we exploit the fact that statements do occasionally reach financial markets during the blackout period. Examples for such instances comprise delayed reporting of statements that were made after market closure on the last day prior to the *purdah*, pre-scheduled obligatory speaking engagements during the *purdah* such as testimonies (only observed in the earlier parts of our sample), unintentional or at times possibly intentional statements. This paper does not look into the underlying motivations for such statements, as we are only interested in understanding their impact on financial markets.

We study the impact of communication on the level as well as the conditional volatility of interest rates along the US yield curve. We find that short-term interest rates react three to four times more strongly to statements reported in the pre-FOMC *purdah* (immediately before FOMC meetings) than during other times. Furthermore, statements reported in the pre-FOMC *purdah* tend to raise market volatility while those in the post-FOMC *purdah* (in the days following FOMC meetings) or outside the *purdah* tend to lower volatility. Therefore communication appears to have fundamentally different implications for market uncertainty depending on its timing.

The empirical findings have several implications. Taking a broader perspective, the results underline that the timing of communication matters for its impact on financial markets. The excessive sensitivity of financial market participants to communication in the *purdah* prior to FOMC meetings suggests that central banks might indeed be well advised to observe this rule. By contrast, post-FOMC *purdah* statements mostly *reduce* the conditional variance of interest rate movements, thus suggesting that they are at least partly successful in lowering uncertainty and settling markets. Communication immediately after policy surprises in particular may be an effective policy tool.

As the *purdah* concerns only a relatively short period of time, the findings of this paper are not applicable to guide central banks' communication policies outside this restricted time window. Nonetheless, the analysis of this special event provides relevant lessons about the limits to central bank transparency.

1. Introduction

Central banks around the globe are pursuing not only different policy objectives, but they also have in place vastly different strategies of conveying policy and communicating with the public. Despite these differences, however, there is one element that most central banks share, at least among advanced economies. This element is the *purdah*, the practice of a self-imposed, voluntary guideline to abstain from communicating in the period around monetary policy decisions and other important events. The existence of such a practice is remarkable in several ways. At first sight, it seems to contradict the virtue of transparency which has become the hallmark of virtually all progressive central banks today, as it requires withholding information from the public when such information is sought after intensely and would likely affect financial markets substantially.

Why then do central banks pursue such a policy? Remarkably little official information about this practice is provided by central banks, partly reflecting the fact that the *purdah* is mostly not an official rule but a voluntary guideline, created by the members of the policy-setting committees themselves. The information that is available on this practice indicates that an important rationale for the *purdah* is the fear that communication just before policy meetings or other important events may create excessive market volatility and “unnecessary speculation” (Federal Reserve 1982, 1995; Bank of England 2000). This presumably may not only be detrimental from a financial market perspective, but it may also narrow the options for committees in their policy decisions. Similarly, statements by individual committee members just after a policy decision may be feared to “dilute” the message of the decision (Federal Reserve 1995).

These arguments underline that at times and under certain circumstances central banks consider communication to be undesirable – even if, or precisely because they have superior information – thus stressing the limits to central bank transparency. The paper assesses this practice for the Federal Reserve, for which a *purdah* has been in place at least since the early 1980s, nowadays for the 7 days before and 3 days after Federal Open Market Committee (FOMC) meetings, as well as before the Chairman’s semi-annual testimony to Congress¹ For our empirical analysis, we exploit the fact that statements do occasionally reach financial markets during the blackout period. Examples for such instances comprise delayed reporting of statements that were made after market closure on the last day prior to the *purdah*, pre-scheduled obligatory speaking engagements during the *purdah* such as testimonies (only observed in the earlier parts of our sample), unintentional or at times possibly intentional statements. This paper does not look into the underlying motivations for such statements, as we are only interested in understanding their impact on financial markets.

We study the impact of communication on the level as well as the conditional volatility of interest rates along the US yield curve. We find that short-term interest rates react three to four times more strongly to statements reported in the pre-FOMC *purdah* (immediately before FOMC meetings) than during other times. A further revealing finding is that statements by FOMC members reported in the pre-FOMC *purdah* tend to raise market volatility while those in the post-FOMC *purdah* (in the days following FOMC meetings) or outside the *purdah* tend to lower volatility. Therefore communication appears to have fundamentally different implications for market uncertainty depending on its timing.

Moreover, communication that is reported during the blackout period (which we will call “*purdah* communication” or “*purdah* statements” for simplicity) moves interest rates differently from other communication primarily at the short end of the maturity spectrum.

¹ We use the Federal Reserve as a case study, rather than a panel of central banks, because the Federal Reserve is one of the few central banks that acknowledges the presence of such a practice, and because it provides us with a sufficiently long time period for the empirical analysis.

This is indicative that market participants focus more strongly on the current monetary policy stance than on the longer-term outlook for policy in such instances. Finally, the market impact of *purdah* communication is directly linked to the monetary policy environment in which it occurs. In particular, *purdah* statements immediately following an FOMC decision that came as a surprise for financial markets have a substantially larger effect on the level of US interest rates and reduce market volatility much more strongly.

The empirical findings have several implications. Taking a broader perspective, the results underline that the timing of communication – not just relative to policy meetings, but more generally dependent on the market conditions – is of crucial importance when shaping communication policies. The excessive sensitivity of financial market participants to communication in the *purdah* prior to FOMC meetings suggests that central banks might indeed be well advised to observe this rule. These statements seem detrimental as they move markets excessively, and at the same time raise market volatility substantially, thus providing support for central banks' claims that such communication creates excessive volatility. By contrast, post-FOMC *purdah* statements mostly *reduce* the conditional variance of interest rate movements, thus suggesting that they are at least partly successful in lowering uncertainty and settling markets. Communication immediately after policy surprises in particular may be an effective policy tool.

Beyond these implications for policy makers, the paper adds to the recent literature on monetary policy, transparency and communication. One important strand of this literature has focused on the issue of incomplete, asymmetric or noisy information. In the work by Morris and Shin (2002) and Amato, Morris and Shin (2002), transparency may be detrimental to welfare because of the noisiness of the information coupled with central banks' focal role as market coordinator; although Svensson (2006) challenges that central bank information may not be sufficiently noisier than private information. In a similar vein, Faust and Leeper (2005), Cukierman (2006), Rudebusch and Williams (2006) and Gosselin, Lotz and Wyplosz (2007) show the potentially welfare-reducing effects of central bank transparency in an environment of information asymmetries or heterogeneity. Moreover, an important part of the literature has focused on the overall quality of information available to central banks (Romer and Romer 2000, Orphanides 2003).

A different strand of the literature stresses the role of the market environment for transparency to be effective and desirable. Bernanke, Reinhart and Sack (2004), Eggertsson and Woodford (2003) and Woodford (2005) emphasize that Fed communication was crucial when there was a deflationary risk for the US economy. Gürkaynak, Sack and Swanson (2005) and Ehrmann and Fratzscher (2007a) analyze the announcement of FOMC decisions, in particular the effectiveness of the balance-of-risks assessments since May 1999, and show that the bias has indeed been an effective guide of market expectations about the path of monetary policy.

A final area is the rapidly growing empirical literature on understanding how central bank transparency and communication affect financial markets. Overall, there has been compelling evidence that communication exerts a substantial impact (Guthrie and Wright 2000, Kohn and Sack 2004, Reinhart and Sack 2006, Ehrmann and Fratzscher 2007b), though an open question remains to what extent central banks really intend to move financial markets.

The present paper broadly fits into these three areas, but it is also distinct in several ways. In particular, the argument presented here in an empirical setting is that there may be important instances when central bank information is vastly superior, but still communication may be welfare-reducing and thus such information is withheld, or at least channeled in a specific manner. Moreover, the paper stresses the importance of the market environment and the endogeneity of the effects of communication. As the *purdah* concerns only a relatively short period of time, the findings of this paper are not applicable to guide central banks'

communication policies outside this restricted time window. Nonetheless, the analysis of this special event provides relevant lessons about the limits to central bank transparency.

The paper proceeds by discussing the institutional design of the purdah at the Federal Reserve in section 2, before section 3 outlines the measurement of communication by FOMC members. Section 4 analyses how purdah communication has affected financial markets. Section 5 concludes.

2. Institutional Design of the Purdah Period

The word ‘purdah’ originally comes from Urdu and Hindi, and literally means ‘curtain’. It refers to the practice of preventing men from seeing women, which is followed in some Islamic countries and among some groups of society in India. It traditionally has taken two forms, one the practice of women concealing their bodies and faces, and another the physical segregation of men and women (see e.g. Wikipedia 2008). In the Western world, the term seems to have first been used in the UK, with reference to the practice of withholding relevant information about the UK budget or just before general elections.

The term has also increasingly been used informally with reference to central banks. However, there is remarkably little official information about the practice of the purdah among central banks. One reason for this lack of official recognition may be the fact that the practice constitutes a voluntary, self-imposed guideline, rather than an explicit rule. However, a notable exception is the Bank of England, which provides an official statement about “speaking restrictions” (Bank of England, 2000):

“Monetary Policy Framework Speaking Restrictions:

To help prevent unnecessary speculation about MPC interest-rate decisions, members of the Monetary Policy Committee have a ‘purdah’ guideline. This requires that for a limited time each month they avoid giving speeches and speaking to the news media or other interests, on or off the record, about monetary and fiscal policy and the conjuncture, or anything else which could be considered relevant to their interest rate decisions or the forecast.

- *The limit is for a period of eight days from the Friday before the MPC meeting to the Friday immediately after the announcement.*
- *The period is inclusive of both Fridays, running from midnight to midnight.*
- *In addition, in the four months when the Inflation Report publication and press conference take place (February, May, August and November) the purdah extends to midnight at the end of the day of publication.*
- *The guideline also precludes publication during purdah of any interview given beforehand.*
- *Other senior executives within the Bank also generally adhere to the guideline.”*

Although no such official statements are available for most central banks, including the Federal Reserve, transcripts of various FOMC meetings over the past few decades provide some information about the purdah practice, its rationale and objectives for the FOMC.

The study of FOMC transcripts shows that the purdah practice for the Federal Reserve goes back at least to the early 1980s, to a time when FOMC members talked relatively freely to the media immediately before and after FOMC decisions. The transcripts indicate that some journalists went so far as to do a “round-robin” of calling all 19 FOMC members before a meeting, thereby obtaining a fairly accurate understanding of the likely debate in the FOMC and its outcome (Federal Reserve 1982, 1995, see Appendix A1 and A2)

An important FOMC meeting that clarified a number of details, and also introduced some changes, to the *purdah* or blackout period was the FOMC meeting of January 31-February 1, 1995. In 1994, Chairman Greenspan had appointed a four-member sub-committee on FOMC disclosure policy, chaired by then-Governor Alan Blinder, which had been asked to review FOMC disclosure practices and possibly suggest changes. The sub-committee tackled four main issues, including first, the practices surrounding the announcements made by the FOMC after each meeting since February 1994; second, tapes and transcripts made of FOMC meetings and their release; third, the release of minutes of FOMC meetings; and the issue of the blackout period of communication by FOMC members.

Several issues require clarification regarding the *purdah* period. A first issue is what *type of information* the *purdah* period excludes from being discussed publicly. It obviously concerns monetary policy issues, but even in the FOMC discussion on this question in 1995 it was not clear to all FOMC members whether this includes also information about the economic outlook and the forecast. During this meeting, it was confirmed that it includes all types of information that are relevant for monetary policy decisions, including the overall condition of the economy (Federal Reserve 1995, see Appendix A4).

As a second issue – the *length of the purdah period* – it lasts from seven days before an FOMC meeting, which usually take place on Tuesdays, till the end of the week of the meeting. In fact, the FOMC at its January 31-February 1, 1995, meeting decided to shorten the blackout period after FOMC meetings from 7 days to about three days, as it was felt that the *purdah* period was relatively long under the previous practice, covering one third of the usual six-week length of a typical inter-meeting period. In addition, a third element of the blackout guideline is the period between FOMC meetings and the Humphrey-Hawkins testimonies, since 2000 called Semiannual Monetary Policy Report of the FOMC Chairman to Congress. These testimonies take place twice a year, usually in February and in July, and the *purdah* guideline indicates that there should be no communication by FOMC members between the previous FOMC meeting and the testimony during those two months.

A third point concerns the *motivation* for the *purdah* guideline. The rationale is obviously somewhat different depending on whether the guideline concerns the time before or after FOMC meetings, or before the monetary policy testimonies. From the transcripts of past FOMC meetings it appears that one concern is that communication immediately before monetary policy decisions may create excessive market speculation and market volatility, which moreover may narrow the options of the committee. This is also expressed in the Bank of England statement above, which talks about “unnecessary speculation”. By contrast, a major concern for communication immediately after FOMC meetings is that “the thrust of the announced decision of the Committee then gets diluted” by these statements, as expressed by Mr. Greenspan (Federal Reserve 1995, see Appendix A5). Moreover, the rationale for not communicating before the monetary policy testimonies is not to “preempt” or possibly even contradict the information the Chairman is going to give to Congress (see Appendix A6).

As transcripts are released only with a five-year delay and given the unofficial character of the guideline, it is hard to say whether there have been any changes in the Federal Reserve’s *purdah* guideline since 2002. However, from the actual practice and the few comments by FOMC members on this issue, it appears that the blackout guideline continues to be in place. As a final note, it is interesting that in the transcript of the January 31-February 1, 1995, meeting, it was acknowledged that the *purdah* “has not worked 100 percent” (Federal Reserve 1995, p. 35). The objective of the remainder of the paper is therefore to investigate the effects of *purdah* communication on financial markets to assess whether there is empirical support for the argument that *purdah* communication might create excessive volatility.

3. Measuring Communication

As to the data on communication, our objective is to extract all relevant public statements by the FOMC as a whole as well as by its individual members in the entire inter-meeting period, i.e. both within and outside the purdah. The database was originally developed in Ehrmann and Fratzscher (2007b), and was extended through June 2007 for the present paper. The methodology behind the database is explained in detail in Appendix B, while we give only a summary outline in this section. We intentionally take a financial market perspective and attempt to measure all information financial market participants receive about statements by the FOMC members. We therefore chose *ReutersNews*, one of the dominant newswire services, as a data source from which to extract all statements about the monetary policy inclination or the economic outlook by the FOMC members. Only statements by the committee as a whole, such as on FOMC meeting days or the release of the Minutes, and statements by FOMC members on such days are excluded from the analysis.

As a next issue, we classify each statement into whether it implies an inclination towards an easing, a tightening or no bias concerning monetary policy (assigning the values -1, 1 and 0, respectively; for instance, a concern about higher inflation would constitute an inclination towards tightening, a statement about a weakening economic outlook an inclination towards easing). Such a classification is valuable because it allows us to test whether statements exert a significant effect on the mean of asset prices, rather than only on the volatility. A key difficulty is clearly how to ensure that the classification is done correctly and reflects market participants' understanding of the message. As outlined in more detail in Appendix B, we use content analysis to achieve this classification, which implies having different individuals classify the statements independently and discarding those that are not unanimous. Nevertheless, the classification of the great majority of statements was unanimous.

We chose to begin our analysis in February 1994 when the FOMC started announcing its decisions immediately following each FOMC meeting. In total, our database includes statements surrounding 106 scheduled FOMC meetings, while unscheduled FOMC meetings are excluded since these are difficult to compare to regular meetings. Our database covers 477 statements in total. With around 90%, the vast majority of statements is recorded outside the purdah. These aggregate numbers conceal interesting time variations, however. First, there is a clear increase in the number of statements. Over the period from 1994-2000, which covers 55 FOMC meetings, we have recorded a total of 180 statements, whereas in 2001-2007 (51 FOMC meetings), our database contains 297 statements. At the same time, there has been a remarkable reduction in purdah statements, with 31 pre-FOMC purdah statements (i.e. those reported in the seven days prior to scheduled FOMC meetings) in the first, and 15 in the second subsample (see Table 1). For the years from 2005-2007, only 1.4% of all statements are such pre-FOMC purdah statements.

Table 1

Table 1 lists furthermore the percentage share of inter-meeting periods when there were statements by FOMC members in the purdah period. The declining incidence of purdah communication is apparent also here. In total, there have been purdah statements in 42% of the 106 FOMC meetings since 1994, and more precisely, in about one out of three pre-FOMC purdah periods and one in seven post-FOMC purdah periods. The share of FOMC meetings with purdah statements drops to only 15%, or three statements in total, in the period 2005-2007.

These numbers seem quite substantial. However, it should again be emphasized that the fact of a statement having been published during a purdah period *does not necessarily constitute a violation of the purdah guideline by FOMC members*. There are a number of reasons why a

statement can be published during a blackout period. In our database, there are a number of instances where a statement was made on the evening of the last day prior to the purdah, for instance on the occasion of a dinner speech. As markets had closed by the time of the event, these statements often get reported upon on the next morning, i.e. within the purdah. At the beginning of our sample period, we also observe purdah statements made on the occasion of pre-scheduled, obligatory speaking engagements such as testimonies. Of course, there might also be misreporting or misunderstandings, such that a statement that was not intended to fall under the purdah guidelines is reported on in a way that makes it look like a purdah statement. As misunderstandings might also occur during our own classification, Appendix C provides the relevant statements contained in our database, allowing the interested reader to cross-check our classification. Finally, statements might also be due to intentional efforts to convey important information to markets. In this paper, we do not take a stand on the underlying reasons; we take the observed statements as our starting point, with the objective of analyzing their effect on financial markets. This is what we turn to next.

4. Purdah communication and financial market reactions

We now turn to analyzing the effects of communication on financial markets and the question whether statements reported in the blackout period are special in this regard. We study the effect of communication on the level as well as the volatility of asset prices, in particular interest rates along the yield curve. For that purpose, we estimate an exponential GARCH (EGARCH) model, following Nelson (1991), to test for the effect of statements on both the conditional mean as well as on the conditional variance of asset prices at a daily frequency. An EGARCH(1,1) model is sufficient to address the non-normality of the data, in particular the serial correlation and heteroskedasticity of the daily interest rate series. The conditional mean equation is formulated as

$$r_t = \alpha + \sum_k \beta^k COM_t^k + \gamma r_{t-1} + \delta z_t + \varepsilon_t \quad (1)$$

with r_t as the change in the daily US interest rate series, r_{t-1} as the lagged change, z_t as a vector of controls comprising day-of-the-week effects, and COM_t^k as the communication variables. As explained in section 3, COM_t^k takes the value of -1 for statements suggesting an easing inclination, +1 for statements suggesting a tightening, and 0 otherwise.² k denotes statements reported in the three different parts of an inter-meeting period, i.e. $k \in \{post - FOMC\ purdah, no\ purdah, pre - FOMC\ purdah\}$. Note that the model is estimated for all business days in the sample, i.e. also for days where no communication occurred. As $\varepsilon \sim (0, h_t)$, we express the conditional variance as

$$\begin{aligned} \log(h_t) = & \tau + \omega \left(\left| \frac{\varepsilon_{t-1}}{\sqrt{h_{t-1}}} \right| - \sqrt{2/\pi} \right) + \phi \log(h_{t-1}) + \kappa \left(\frac{\varepsilon_{t-1}}{\sqrt{h_{t-1}}} \right) \\ & + \sum_k \lambda^k CD_t^k + \sum_d \xi^d z_t \end{aligned} \quad (2)$$

² Differently to the standard practice in the announcement literature, we do not control for market expectations, for mainly two reasons. First, identifying market expectations about the content of a speech or an interview is practically impossible. Second, even though some of the speaking engagements might be pre-announced, their content is in most cases not. The mere fact that a speaker touches upon an issue (even though possibly confirming the market's views about the future path of policy) can therefore be sufficient to generate relevant news to the market. Otherwise, we would expect our variable to be measured with error, leading to an attenuated estimator in the mean equation.



such that the conditional variance of US interest rate changes (h_t) is a function of the past variance (h_{t-1}) and past innovations (ε_{t-1}), as well as a communication dummy CD_t^k , that takes the value 1 on all days a communication event is observed, and 0 otherwise, and the day-of-the-week effects z_t . The model is estimated via maximum likelihood, using a Simplex algorithm to obtain initial values and the BHHH and BFGS algorithms for optimization.

Our interest lies in particular with two parameters, namely β and λ . A first hypothesis suggests that $H_0: \beta^k > 0$, i.e. that communication has an effect on the level of US interest rates, and in the expected direction (whereby “easing statements” lower interest rates, and “tightening statements” raise them). This should hold for all parts of the inter-meeting period alike. In contrast, the hypothesis of elevated market sensitivity would suggest that $\beta^{purdah} > \beta^{no-purdah}$. Unfortunately, such a pattern could arise due to two reasons, however. First, it would result if purdah communication indeed would lead to stronger market reactions. Second, and observationally equivalent, it would emerge if the information contained in the communication during the purdah carried a different information content. These two factors are very difficult to distinguish, and we can only provide indirect evidence in that regard.

Finally, we do not have a prior on whether communication would increase or reduce volatility; however, the hypothesis that purdah communication carries the risk of triggering excess volatility would imply that $\lambda^{purdah} > \lambda^{no-purdah}$.³ Unlike in the case of the mean equation, we are not aware of an alternative explanation that could generate this relationship, such that this test is able to provide clear-cut evidence about the excess volatility hypothesis.

Table 2 shows the point estimates for the effect of Fed communication on US 6-month interest rates,⁴ separating whether statements occurred in one of the two parts of the purdah or whether they took place in the inter-meeting period outside the blackout period. The right-hand columns indicate whether the coefficient estimates are statistically significantly different from one another.

Overall, statements by FOMC members appear to have a highly significant and sizeable effect on short-term interest rates. With all three estimates for β^k being positive, there is clear evidence that communication affects interest rates in the expected directions. Statements outside the purdah period move the level of interest rates on average by about 0.6 basis points (b.p.). By contrast, statements in the pre-FOMC purdah period affect interest rates on average by 4.3 b.p.. Hence, the hypothesis that $\beta^{pre-FOMC\ purdah} > \beta^{no-purdah}$ is easily accepted for the pre-FOMC purdah communication. At the same time, we do not find that $\beta^{post-FOMC\ purdah} > \beta^{no-purdah}$, as statements in the post-FOMC purdah have no statistically significant effect on the level of US short-term interest rates.

Table 2

Of course, statements during the purdah period are much less frequent than those outside of it – Table 1 showed that there were only 62 statements during the purdah in 1994-2007 – so that this finding should not be interpreted as implying that communication in the purdah period moves interest rates by more overall. Nevertheless, what the findings underline is that a single statement has a substantially larger impact on financial markets if it is made during the purdah period just prior to FOMC meetings. This supports the argument by central bankers that

³ Note that the volatility in this model is a conditional one, implying that λ measures the effect of statements on that part of the variance which cannot be accounted for by the effect of communication and other controls on the level of interest rates. Hence, for instance, it can be consistent to find that $\beta > 0$ and $\lambda < 0$, i.e. that a particular type of statements moves the level but also lowers the conditional variance of interest rates.

⁴ All interest rate data are constant maturity treasury rates provided by the U.S. Treasury.

markets are generally much more sensitive to statements made shortly before FOMC meetings – although we still need to check whether the competing hypothesis of a fundamentally different information content of the two types of communication gets supported by the data. We will return to this later on.

An interesting difference is present for the conditional variance of US interest rates. Communication in the pre-FOMC purdah tends to raise market volatility, while statements in the post-FOMC purdah period and outside the purdah lower it significantly. This suggests that the timing of statements is important. In particular, communication just before FOMC meetings raises volatility, whereas statements immediately following FOMC decisions tend to help settle markets by lowering interest rate volatility.

Figures 1-2

We next extend the analysis to the full maturity spectrum of US interest rates. Figure 1 shows the point estimates and 90% confidence intervals for the impact of pre-FOMC purdah, post-FOMC purdah, and no-purdah statements on the level of interest rates ranging from 1 month to 20 years. Figure 2 provides the same information for the conditional variance. The main finding of the figures is that the differences across types of statements are largest at the short end of the maturity spectrum, which become somewhat smaller and in some cases statistically insignificant beyond 1-year maturities. For instance, the coefficients for pre-FOMC purdah and no-purdah statements on the level of US interest rates are significantly different up to 1 year, but converge and become equal at the long end of the yield curve. Even more striking is the convergence process for the conditional variances shown in Figure 2 as differences to pre-FOMC purdah statements are very large up to 1-year interest rates and then disappear thereafter.

Figure 3

How robust are these results? We conduct a battery of robustness tests and extensions to check whether and how these benchmark findings may change. In particular, given the limited sample size for purdah statements, we need to ensure that the point estimates are not driven by a few outliers. Figure 3 shows the histogram for the distribution of interest rate responses on communication days during the purdah (Figure 3.A) and on communication days outside the purdah (Figure 3.B), for 6-month interest rates. Most importantly, there are no outliers that appear to drive the results. Second, we more directly control for other factors that may drive interest rates on communication days by including in the vector of controls z_t a set of 12 important US macroeconomic announcement shocks.⁵ The results of Table 2 and Figures 1 and 2 are basically unchanged when such news shocks are included, suggesting that at least such news do not systematically affect the findings for FOMC communication. Third, we test for parameter stability over time. Keeping in mind the limitations imposed by the small sample, we split the sample in May 1999 when the FOMC changed its communication strategy by providing a bias statement with its decisions, which in turn could mean that purdah communication (at least in the post-meeting purdah) may have become less relevant. However, the point estimates of Table 2 are not statistically significantly different when taking this sample split, confirming the robustness of the findings also from this perspective.

Returning to the analysis, what the findings indicate so far is that market reactions to communication in the different parts of the inter-meeting period are fundamentally different.

⁵ These include the most standard variables used in the announcement literature, i.e. indicators of real activity (GDP, industrial production, unemployment, non-farm payroll employment, hours worked, retail sales), confidence indicators (ISM, consumer confidence, housing starts), prices (CPI and PPI) and the US trade balance. Monetary policy surprises are excluded as no statements on FOMC meeting days are included in the analysis.

On the one hand, the evidence about increasing volatility in the pre-FOMC purdah clearly supports the notion of purdah-communication creating excessive volatility. On the other hand, the fact that communication in the pre-FOMC purdah raises interest rate levels by more than otherwise, as well as that the differences in the effects on the level of interest rates are largest for the short end of the maturity spectrum could be due to two reasons. Either markets attach stronger weights to this information, and try to distill in particular information on the current monetary policy stance rather than on the longer-term outlook for policy, or purdah statements contain fundamentally different information, e.g. about upcoming decisions which helps market participants to better anticipate decisions.

Table 3

A first reason why it is most likely not the information content that differs lies in our construction of the dataset. By searching exclusively for statements that bear the name of an FOMC member, we neglect statements by “senior Fed officials”, which are often assumed to be a means to get important information to markets without having to go through the standard communication channels. For these types of statements information content might well be different.⁶ Second, in order to further get at this issue, and to see how robust the results are, we extend our analysis by distinguishing between different conditions under which statements are made. Due to the small number of observations of purdah communication, a further split is bound to lead to small samples, likely affecting the significance of our results. Table 3 shows the impact of statements *conditional* on the characteristics of the surrounding FOMC decisions. A number of striking findings stand out. First, the effects of pre-FOMC purdah statements on the level of interest rates do not depend on whether or not policy rates will be changing at the upcoming meeting. We take this as suggestive evidence that the information contained in the pre-FOMC purdah statements is not fundamentally different from other communication; if it were, we would expect to see larger effects on interest rates if an interest rate change was in the offing. We stress that this interpretation of the finding is merely suggestive as it assumes that interest rate changes are less anticipated than decisions where rates are kept unchanged. While this is in general the case for the full sample period, it obviously may not hold for each individual meeting.

Second, statements in the post-FOMC purdah period have a substantially larger effect when the last decision entailed a surprise for market participants. This holds both for the conditional mean and the conditional volatility of interest rates, and is suggestive that there is scope for FOMC members to clarify a given decision beyond the FOMC statement accompanying its announcement.

Finally, the impact of statements on the level of interest rates is mostly larger when market uncertainty (as measured through the degree of interest rate volatility in the inter-meeting period) is high. This is suggestive that communication appears to add more information when such uncertainty is high. By contrast, statements in many cases raise the conditional variance of interest rates. The exception is again the post-FOMC purdah communication, which helps to lower the conditional interest rate variance.

In summary, communication by FOMC members appears to be a highly effective tool to guide financial markets. The empirical results of this section indicate that statements reported in the purdah period of the FOMC generally have a much larger impact on financial markets than statements made in the inter-meeting period outside the blackout period. This confirms that markets at the time around FOMC decisions are more sensitive to new information from the FOMC; this finding applies generally to pre-FOMC purdah communication, and also to post-FOMC purdah communication when the preceding decisions came as a surprise.

⁶ We would like to thank Alan Blinder for pointing this out to us.

5. Conclusions

The purdah is a widespread practice among modern central banks, but to our knowledge no work has so far been undertaken to understand the rationale for this practice and to verify it empirically. The objective of the paper has been to fill this gap, in particular as transparency and communication have become important elements of many central banks' work, and the purdah a relevant element of communication strategies. More importantly, the study of the special nature of the purdah offers a unique perspective on central bank communication and the limits to transparency.

The paper has shown that purdah statements before FOMC meetings have a large effect on US interest rates, about three to four times larger than those in the inter-meeting period outside the purdah, and tend to increase market volatility significantly. Both findings provide support for the argument by several central bank committees that markets tend to be more sensitive around policy decisions, and that statements in such a period may induce excessive market volatility. While the case for having a purdah arrangement prior to committee meetings therefore finds strong support, we also find that statements immediately after FOMC meetings lead to a sizable reduction in market volatility, in particular if the preceding decision was largely unexpected. This suggests that there is scope for FOMC members to clarify a given decision beyond the initial FOMC statement announcing it.

We are aware that the purdah concerns only a relatively short period of time, and that the findings here are not applicable to guide central banks' communication policies outside this restricted time window. Nonetheless, the analysis of this special event suggests that there can be cases where an appropriate reception of the information content of central bank communication is not ensured. This special case study therefore yields important insights into the limits to central bank transparency.

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Appendix A: Quotes from FOMC transcripts

A1: Federal Reserve 1995 (p. 35)

“MR. COYNE. This goes back, I would say, 15 years when there was a lot of discussion in the press stemming from comments made by various members of the Committee both before and after an FOMC meeting. Some of the papers liked to do a summary story immediately before the meeting. They would do a round-robin, calling all 19 people. They would compare answers and try to figure out what was going to happen. We were asked to put together some informal guidelines. These are not "rules" of the Committee. They are simply guidelines that I have propagated to the Committee. The purpose was to help the Committee deal with the press in sensitive periods. One of the things we came up with, that the then-Chairman agreed with, was this blackout period. People were not to talk to the press a week before and a week after a Committee meeting. ... ”

A2: Federal Reserve 1982 (p. 54)

“CHAIRMAN VOLCKER. ... Joe Coyne might just talk a minute about his understanding of the rules and then we'll have a more general discussion of this or of any ideas anybody else might have.

MR. COYNE. To be brief, my understanding is that the policy record, of course, comes out the Friday after the following meeting, and what that means is that we do not talk about what happened at that [earlier] meeting until that time. There are very, very, few exceptions to that. We can say we had a meeting: we can give the starting time and the closing time, and the attendance. And that's it. That has been my understanding since the Committee adopted the rules.”

A3: Federal Reserve 1995 (p. 35)

“MR. COYNE. ... The purpose was to try to prevent all the speculation in the press and subsequently in the market about what the Committee would do. Now, we still get that speculation, but we get it from commentators. We do not get it from members of the Committee anymore. It has worked to an extent. It has not worked 100 percent. But a lot of members of the Committee use the blackout period to avoid talking to the press during these sensitive periods.”

A4: Federal Reserve 1995 (pp. 35-36)

“MR. COYNE. Someone asked whether it just covered monetary policy. It was supposed to cover monetary policy and the economy -- things that the Committee discusses when it is formulating monetary policy.

CHAIRMAN GREENSPAN. My impression is that if a reasonably good reporter gets one of us to sit and discuss what is going on in the economy, it is a farce for us to say, "I won't discuss monetary policy but let me tell you what is going on in the economy." It is a farce because, while it may be that in the old days reporters were not very knowledgeable, many of the current breed have MAs and PhDs in economics.”

A5: Federal Reserve 1995 (p. 35)

“MR. COYNE. ... If you are going to make the blackout period asymmetrical, I would say make it asymmetrical to the Friday following the meeting rather than for just two days. If it is only two days, then everybody will jump on it after 48 hours, and we are still going to get a lot of different comments. One of the problems is, if someone comments one way, as Mr. Forrestal just said, somebody else is going to try to jump the other way. Then we are going to get more and more people commenting.

CHAIRMAN GREENSPAN. So, in a sense, the thrust of the announced decision of the Committee then gets diluted in the same way that consenting statements would do that.”

A6: Federal Reserve 1995 (p. 38)

“VICE CHAIRMAN MCDONOUGH. ... That can be between the meeting and the Humphrey-Hawkins testimony because we do not want to preempt what the Chairman is likely to say.”

A7: Federal Reserve 1982 (pp. 53-54)

“CHAIRMAN VOLCKER. ... I might also say that we had a leak—and may be more than one –about the Greenbook, as you know. ... I am convinced that in a way it enormously complicates the policy problem because so much of policy is what people think it is or think our attitude is over a period of time as opposed to what we do. This whole situation is intolerable to me. This organization, above all others in Washington -- ... -- does not leak. And I think it has been to our advantage to have that be both the impression and the reality. It has enormously increased our credibility, the credibility of official statements over the years, and the credibility of policy. I don't see any way we can operate other than on that presumption. ...”

Appendix B: Measuring central bank communication

For the measurement of communication, our analysis is based on the data developed and described in more detail in Ehrmann and Fratzscher (2007b). The objective is to obtain all communication events by FOMC members that contain statements which are relevant to infer information about their monetary policy inclination. We use the newswire service *Reuters News* to extract these statements, along with a time stamp indicating the day on which they occur. We are careful in focusing on forward-looking statements and in avoiding duplication of statements in the database. The extraction is done in a mechanical manner using a set of search words, including the name of the policy maker together with the words interest rates, monetary policy, inflation, economy or economic outlook. This classification follows the examples of Guthrie and Wright (2000) and Kohn and Sack (2004).

As a final step, we classify the statements by the committee members into those that indicate an inclination towards monetary policy tightening, those that suggest an easing, and those that are neutral:

$$COM_t = \begin{cases} +1 & \textit{tightening inclination} \\ 0 & \textit{no inclination} \\ -1 & \textit{easing inclination} \end{cases}$$

The classification of the statements is important and thus needs a more detailed discussion. The technique of extracting meaning from language is often referred to as content analysis (e.g. Holsti 1969). The idea of content analysis is to devise a number of rules to provide a clean classification and to minimize the number of false classifications. In our case, the statements have been double-checked by the authors and independently by the research analyst. In case there was a disagreement on the classification, other reports were used to classify the statement. A statement was discarded if no agreement could be reached. Overall, most statements were judged to be unanimous and only a relatively small number of statements was excluded from the analysis.

Nevertheless, a number of additional caveats should be stressed at this point. First, the list of statements included in our database may not capture all statements by all committee members as *Reuters News* may be selective in its reporting. Second, statements by policy-makers may be misreported or be misinterpreted by the markets, and may thus trigger a reaction that is undesired by the policy maker. Although we recognize the potential relevance of these caveats, for the purpose of this study we are primarily interested in the information that market participants receive, and thus we are less concerned for instance by the fact that newswire services may decide not to report all statements.

Appendix C: Quotes of statements by FOMC members reported during the purdah

Forrestal, 07.02.94

"Earlier declines in oil prices and ongoing import competition are keeping prices well behaved. Of course if growth does prove stronger than expected, we could see rising pressures on resources by the end of the year."

LaWare, 08.02.94

Heading the all-star lineup, Fed board governor John LaWare in Boston Tuesday said that while the U.S. inflation outlook at the moment was not particularly alarming, anticipation of inflation could trigger inflationary behavior. As for last Friday's rate hike, he said that in the past, sufficient action had not been taken to choke off inflationary behavior.

"I don't think there's any reason to believe inflation will deteriorate, but it was a symbolic move to demonstrate the Fed's commitment to keeping inflation under control."

LaWare said more rapid-than-expected growth in the fourth quarter and other positive economic indicators mean "inflationary pressures could begin to build. In a time when there is heightened inflationary anticipation, it can trigger actual inflationary behavior."

Broaddus, 16.03.94

"Most recently, we've had at least some anecdotal comments that suggest that in fact some price increases (at the supplier level) ... are beginning to move," Broaddus said.

"I think it's important that we conduct policy in a way that does err on the side of caution," Broaddus said.

McDonough, 19.03.94

"We cannot afford to risk a surge in inflation," William McDonough said in a speech prepared for a Dallas Federal Reserve conference.

"Clearly, the Federal Reserve needs to provide sufficient liquidity to prevent budget stringency from holding down the economy," McDonough said.

At the same time, the Fed must not permit an acceleration in the rate of inflation, he said.

"Achieving that balance will certainly be one of the Federal Reserve's greatest challenges during the remainder of this decade."

Phillips, 15.04.94

"I do think that recent data on inflation have been fairly good," Phillips said.

As for the U.S. inflation outlook, Phillips said, "There is a positive environment for keeping inflation controlled."

She cited slack in international product markets, U.S. producers' commitments to control costs and U.S. productivity growth as factors behind keeping labor costs and consumer prices down. "These are good reasons to be optimistic."

Greenspan, 22.09.94

Federal Reserve Board Chairman Alan Greenspan said Thursday the U.S. economy has slowed from its "exuberant" levels in late 1993 and early this year, but that growth remains solid.

"The (U.S.) economy is doing well, no question about it. It is solid and its underlying growth is fairly solid," Greenspan told the panel.

Forrestal, 25.01.95

"The principal issue we need to deal with is whether or not the economy is less inflation-prone than it was in the recent past," Robert Forrestal, President of the Atlanta Federal Reserve Bank, said.

If indeed it is, Forrestal suggested in a speech on Monday, the Fed would not have to raise interest rates as aggressively as in the past to keep price pressures in check.

Greenspan, 25.01.95

"We would welcome the possibility that our economic performance can be in excess of historical relationships," Greenspan said. "But if we ignore experience, we would be taking unacceptable risks of higher inflation (and) economic and financial instability."

Greenspan, 27.01.95

"The very torrid rate of growth that we had through the latter part of 1994 is slowing down, and that is an important plus for the economy," he told the Senate Budget Committee.

Minehan, 30.03.95

"Retail sales have slowed in recent months and the national pace of job growth has moderated. Some interest-sensitive sectors of the economy are also slowing -- auto production has slipped in past months and activity in the nation's housing sector is more subdued," Minehan added.

Blinder, 18.05.95

The vice chairman of the U.S. Federal Reserve said on Thursday he was optimistic the central bank would reduce growth to a sustainable rate without tipping the economy into recession.

Although inflationary pressures are mounting, he said he did not think inflation "has got a lot of momentum" and believes the natural rate of unemployment -- the rate consistent with stable inflation -- is about 5.5 to 5.6 percent.

McDonough, 18.05.95

Looking forward, he said monetary policy will depend on what the Fed sees happening in the future, adding: "One of the main features of the future is the decline of the savings rate in American households since the mid-1980's."

"The rest of the world, those very savers on whom our already inadequate investment depends, are losing patience with a country that they increasingly think is not managing its domestic economy sufficiently well," McDonough said.

Greenspan, 22.09.95

Federal Reserve Chairman Alan Greenspan said Friday the economy was looking up and that he saw no signs that growth was being held back by the high level of short-term interest rates.

"On the whole, the near-term prospects for the U.S. economy have improved in recent months," Greenspan told the Senate Banking Committee.

"Real short-term interest rates are marginally above where the intermediate average has been," Greenspan said. "(But) we have general indications that the economy is nonetheless moving forward."

"The inflation picture is (also) looking more favourable," the Fed chief said. "Inflation ... has moved back down ... and there appears little reason to expect much change in inflation trends in the near term."

McTeer, 20.03.96

"We are not satisfied with 2.5 to 3.0 percent inflation," McTeer told a Rotary Club and Better Business Bureau meeting. "We ought to keep edging inflation downward until it goes away."

McTeer added that the Dallas Fed's own estimate is of an upward bias of 0.5 percent to 1.0 percent, which would bring the current inflation rate down to around 1.0 percent. But he stressed that the goal is to push inflation even lower to the point where it is completely eradicated.

"Five percent short-term interest rates do not seem all that burdensome to me. I think if the economy has an impulse to grow, it will grow."

McTeer described the current unemployment rate of 5.5 percent as "fairly low."

Concerning recent figures on industrial production and capacity utilization, McTeer said they were "strong but not overly strong."

Greenspan, 27.03.96

"Recent economic data suggest that the economy should be able to continue operating at a high level ..., sustaining growth without risking a reversal of progress that has been made toward ... price stability," he said.

McTeer, 15.08.96

The U.S. economy is "without noticeable stress or strains," he said in a speech delivered at the Buenos Aires stock exchange.

... he said both the federal funds rate and long Treasury yields were "certainly in the neighborhood of being reasonable."

Broaddus, 07.11.96

"The recent inflation reports have...been encouraging," Broaddus said in a speech at the University of North Carolina at Pembroke.

Broaddus highlighted the fact that the core CPI is up 2.7 percent over the last year, which he said was "a quite moderate rate of growth."

Broaddus said the current inflation rate of around three percent was "not good enough." He suggested pushing the rate down toward two percent and "holding it there for the long haul."

Turning to recent trends in economic growth, Broaddus noted that gross domestic product growth decelerated sharply in the third quarter to an annual rate of 2.2 percent after "hefty" growth of 4.7 percent in the second quarter.

However, he said: "My own view is that this is a happy outcome because it tends to support the current predictions of the majority of economic forecasters that the economy is slowing to a more sustainable growth rate."

Greenspan, 20.03.97

"Activity has retained a great deal of vigour in early 1997," the central bank chief said. "The prospects for sustaining the expansion are quite favourable."

Broaddus, 13.05.97

"Well, the forecast is for a modest increase in the core rate of inflation this year, but really only a modest, marginal increase, with the core CPI remaining below 3.0 percent at an annual rate in 1997," he added.

"There are some downside risks, but ladies and gentleman, as I look at all of the factors as best as I can I would have to say I think the risk ... is more heavily weighted to the upside, specially with respect with prospects of prices and inflation," Broaddus said.

McDonough, 23.09.97

"The August data indicates that the situation as we saw it before of continuing economic growth and very good price performance is still intact," he told reporters during the annual World Bank/IMF meetings.

Phillips, 23.09.97

"The recent data continue to show that prices are rising at a rather subdued pace."

"I do think that the risks to the inflation outlook seem to be tilted to the upside," she said. "The bottom line for me at least is we can't let our guard down and declare victory in the battle against inflation."

Rivlin, 07.11.97

"From an aggregate point of view, almost all the economic news is good, astonishingly so."

Inflation was "remarkably low," to the surprise of economists, she said.

Guynn, 05.11.97

"My Fed colleagues and I must be ready, again, to adjust monetary policy promptly if and when is called for," Guynn stated.

Greenspan, 07.11.97

"Biases of a few tenths in annual inflation rates do not matter when inflation is high. They do matter when, as now, a debate has emerged over whether our economies are moving toward price deflation."

McDonough, 13.11.97

"The U.S. economy is doing extraordinarily well," McDonough told an audience of economists and businesspeople gathered here.

McDonough said U.S. inflation has been very well contained and in some cases even falling.

Greenspan, 13.11.97

"The forces that have emerged out of the Southeast Asian difficulties are imparting a disinflationary aspect on the United States and others. I am not saying that they are dominant or overwhelming ... they are a force but they are not at this stage the severe dominant force in this country."

"To date, the direct impact of these developments on the American economy has been modest, but it can be expected not to be negligible."

Rivlin, 09.12.97

"We haven't had inflation, the only reason for worrying about inflation is that the economy might overheat, and we see this (the crisis in Asia) taking the pressure off somewhat."

McDonough, 10.12.97

"The Federal Reserve has not had a single measure, as say the Bundesbank, for quite a long time. So, when you have an international disturbance of the kind we have had since July, one looks at what is the effect on the macroeconomy," he said.

"If the macroeconomy would be weaker than the alternate, that certainly would indicate a consideration for monetary policy, and I think that would be the single most important effect on one's thinking."

Minehan, 26.03.98

Federal Reserve Bank of Boston President Cathy Minehan said on Thursday the U.S. banking system is healthier than ever due to a sound U.S. economy with low inflation and strict fiscal discipline.

Phillips, 26.03.98

"The Asian situation is still unfolding, so we don't have any clear picture yet but there undoubtedly will be some effect."

"We are starting to see some effects but I think it will be more visible in the second quarter," and will likely "be anywhere from 1/2 percent to one percent."

McTeer, 27.03.98

"I don't see how it (the Asian crisis) can be anything but a negative factor in the long run."

As for the economy in general, McTeer concluded his remarks by saying the U.S. was "doing great," noting significant progress in the technology arena.

Rivlin, 21.05.98

"The economy at the moment is going very well. But there is always the danger of overheating, of generating inflationary pressure that would be hard to turn around."

McDonough, 26.06.98

"Now in the eighth year of uninterrupted growth, key economic data show few signs of the pressures that could end the expansion any time soon."

"In my view we are in a period of price stability right now."

Guynn, 22.09.98

Guynn, who had told the Money Marketeters all interest rate options seemed open at the moment, described the risks to the U.S. economy as essentially balanced now.

McDonough, 22.09.98

McDonough said while official data still showed strong growth except for in exports - which were hurt by Asia's economic troubles - there were plenty of signs pointing otherwise.

"The anecdotal evidence regarding investment plans, regarding reductions in the labour force and the beginnings of a reduction in consumer confidence all add up," he said. "The balance of risk has shifted from one of concern about inflation to one of concern about inadequate growth."

Moskow, 22.09.98

"Just a few months ago, it seemed that the risks of inflationary pressures generated by our domestic economy outweighed the risks presented by developments overseas."

"More recently, however, these risks seem to have moved into closer balance even as the level of uncertainty increased."

"On the one hand, the fundamentals remain strong in our domestic economy."

"We continue to see tight labour markets and there's still a very real risk of inflationary pressures emerging."

Moskow stressed the other side of the U.S. economic dichotomy comes from "the volatility in the stock market (that) may trim the growth in consumer and business spending to some degree."

"The Asia situation and problems in other parts of the world have reduced foreign demand for our goods and services. This has offset some of the potential inflationary consequences from tight labour markets and strong domestic demand."

Broaddus, 23.09.98

"The current risk of deflation is relatively low, as is the risk of inflation."

McDonough, 25.09.98

The country had had a "remarkably good performance on inflation and I would anticipate that will continue to be the case."

Parry, 09.10.98

Parry said he expects annual U.S. GDP growth to slow to below 2.0 percent in 1999, but that he was not expecting a recession.

Parry said he did not think the U.S. economy was "particularly likely" to experience deflation, although he said there were some areas of the economy, such as commodities, that were experiencing a period of declining prices.

McDonough, 14.10.98

"Signals of a possible credit crunch are in capital markets, specifically in fixed-income markets."

"I don't see anything on the horizon now that leads me to believe any unusual activity by the lender of last resort (the Federal Reserve) is near or anywhere near."

McDonough also described the U.S. deflation risk as "very low" and the inflation threat as "lower than it was six months ago."

Moskow, 15.10.98

"I should stress that we haven't seen many signs of actual weakness in our domestic economy."

McTeer, 19.11.98

"We still have very tight labour markets, with upward pressure on wages and other employment costs, and the money supply is growing well above historically safe rates. At the same time, worldwide deflationary pressures have intensified with the Asian and Russian crises."

"Money growth has been rapid recently, but an acceleration of inflation seems unlikely to me in the face of continuing worldwide deflationary pressures. Oil and other commodities, as well as gold and other metals, continue to decline at rapid rates."

McDonough, 16.12.98

"The likelihood of U.S. inflation is not severe."

McDonough, 27.01.99

"The consensus forecast is about 2.5 percent (of GDP growth) and I think as we enter 1999 as strong as we (were) in the last quarter of last year - which was very powerful - I think most people will be inching up their forecasts."

Parry, 23.03.99

"Overall, we're expecting a modest slowdown from the very rapid rates (of GDP growth) of last year - in the range of 2.5 to 3.0 percent - with continued low inflation."

Minehan, 24.03.99

"There is no doubt that this investment in technology has something to do with the U.S. economy's strong productivity growth."

"This level of growth has to be playing some role in the U.S. economy's low inflation rate in the face of very tight labour markets."

Boehne, 26.03.99

"The performance of the banking industry, like that of the overall economy, has been quite remarkable for some time."

Moskow, 11.05.99

"Overall, the risks of slower growth versus inflationary pressures are reasonably balanced at present."

Rivlin, 13.05.99

"There are things to balance here - the rapid growth of the economy might give us inflation, although it hasn't yet, and downside possibilities, which mostly come from the weak world economy."

McDonough, 19.05.99

One day after the Fed said it may have to raise interest rates to fend off inflationary pressures, McDonough told a housing conference that productivity gains have made it "possible for the economy to grow rapidly. We have higher wages and we do not have inflation."

McDonough, 23.06.99

"At this point, the issue is the potential for inflation which, if allowed to break out, is destructive to the economy."

Guynn, 20.08.99

he warned the Community Bankers of Georgia gathered in Colorado Springs that today's red-hot economy may be producing "unrealistic expectations".

McDonough, 01.10.99

"As of this moment, it would appear that you can grow the American economy at essentially 4 percent per year and have that growth be sustainable."

Stern, 11.11.99

"Wage increases can be offset by productivity increases, and in that case inflation stays low."

McTeer, 18.11.99

McTeer said he thought the core U.S. inflation rate recorded in October, a rise of 0.2 percent, was a good number.

"I don't consider it a goal of the Fed to dampen down asset prices."

Minehan, 14.12.99

"Even if one assumes that all the growth in average productivity since 1996 is structural, given the current very high rates of labour utilization, there is a case to be made that the economy has been growing beyond what is sustainable."

"In this environment, continuing to operate beyond potential carries increasing inflation risk, and risk that this long, benevolent period of U.S. economic growth will come to an end."

Greenspan, 26.01.00

Answering questions, Greenspan reiterated a long-standing warning that the booming U.S. economy was running out of available workers, going as far as to suggest that the country's immigration laws should be relaxed.

But he also noted that the rate of productivity growth, which has helped to temper inflation, had not yet shown any signs of slowing.

"There is really no evidence at this stage that the acceleration process has as yet shown early signs of cresting," he said.

Greenspan, 22.03.00

"Not only has the expansion achieved record length, but it has done so with far stronger growth than expected."

"A key factor behind this impressive performance has been the remarkable acceleration in labour productivity."

Parry, 09.05.00

"The Fed is interested in getting the growth rate of the entire economy down to a more sustainable rate."

Ferguson, 09.05.00

"I firmly believe that we should recognise that, even in a high-productivity economy, stresses and imbalances might emerge."

"The wedge between demand and supply growth cannot continue indefinitely because, once pressures on limited resources rise sufficiently, inflation will start to pick up."

Ferguson, 12.05.00

"The U.S. experience of the last several years has also taught us that low and stable inflation is the underpinning for sustainable growth and that sustainable growth fosters the maximum creation of jobs over time."

McDonough, 18.05.00

"Even with the ability to produce goods and services at say 4 to 4.5 percent, the demand side of the economy is much stronger."

McTeer, 05.10.00

"We haven't repealed the laws of supply and demand, but we are finding some loopholes," he said. "Inflation is down, not out. There are still limits (to demand growth), but they're higher limits."

McTeer, 10.11.00

He noted that the U.S. central bank left short-term interest rates unchanged last month while warning of continued inflation risks because of rising energy costs and the nation's tight labor market.

Stern, 11.05.01

Stern, who stressed he was speaking for himself and not for the U.S. central bank as a body, called the U.S. economic slowdown "significant" and noted it was much deeper than forecasters had predicted. However, the Minneapolis Fed president said he was "optimistic" about the long-term health of the U.S. economy, noting that the nation's economy has proven itself to be resilient, strong productivity gains should continue in the future and public policy will likely continue to boost growth.

Greenspan, 20.06.01

"We see no evidence that those costs are being passed through to final prices in any material way," the Fed chief said in response to questions from members of the Senate Banking Committee. Nor were "fairly extraordinary increases" in energy costs showing up in goods prices, he said, though they were squeezing corporate profits.

Greenspan said core inflation, which excludes volatile food and energy costs, was "relatively stable" and showed no signs of accelerating.

McTeer, 23.08.01

"The dramatic gains made in recent years by those on the fringes of the labor force are threatened. So far the damage has apparently not fallen disproportionately on them, but it will if we do not get the economy jump started soon."

Santomero, 05.11.01

"As the world economy deals with a slowing U.S. economy, a slowing Japanese economy and a slowing Europe, the tenuous grip on economic growth has become even more tenuous in light of the increasing concerns about emerging markets and the aftermath of September 11."

Ferguson, 08.11.01

"As testimony to the resilience of the American spirit, the immediate impact of the attacks has proved transient."

"The longer term prospects for the U.S. economy remain sound, just as they were before Sept. 11."

He conceded, however, that for a period of time "consumer and business behaviors will significantly affect the way our economy progresses."

Moskow, 04.12.01

"The strength in the housing sector this year has been very positive for the U.S. economy that is clearly extremely weak at this point."

McDonough, 06.12.01

"I don't know what the economy is going to do next year. What we don't know is - are we at the turn, have we reached the turn?"

Greenspan, 24.01.02

"But there have been signs recently that some of the forces that have been restraining the economy over the past year are starting to diminish and that activity is beginning to firm."

McTeer, 23.01.02

"I think the GDP (Gross Domestic Product) numbers they've got are realistic, but they may be a little bit too conservative."

"I think the weakness in the first half will probably be offset by more strength in the second half."

Olson, 12.03.02

"We have recently experienced a decade of economic prosperity followed by more than a year of weak economic conditions. For the past few months we have seen clear indication that economic conditions are improving and we are either at or near the end of the down cycle."

Greenspan, 14.03.02

Greenspan repeated recent testimony he had made to Congress, citing "increasing signs that some of the forces restraining the economy over the past year are starting to diminish and that activity is beginning to firm."

Santomero, 21.03.02

"As the year progresses, we will move steadily from recession to recovery and sustained expansion."

"It's commonly the case that inflation numbers decline at the beginning of a recovery because of the excess capacity associated with a recession. Therefore, in the near term, I believe inflation is well contained."

Greenspan, 25.09.02

While the recovery has been patchy, Greenspan said productivity, or output per worker, has been "unbelievably strong" in recent quarters, which implies continued growth.

McTeer, 23.01.03

"I think the outlook for 2003 is certainly not for a relapse or a double dip, maybe not for a booming economy but I think the stage is set reasonably well."

"I think the conditions for continued recovery and for the recovery to gather some momentum are very good."

McDonough, 20.03.03

"One concern I have is that the recovery in the business sector continues to be restrained not just by geopolitical uncertainty and the need for further restructuring in some key sectors, but by caution on the part of investors and lenders."

"The effects of the bursting of the stock market bubble have proven to be far more long-term and pervasive than expected."

"The employment claims data this morning are gloomy yet again."

He said the U.S. economy was growing below its potential growth rate.

Greenspan, 30.04.03

"I continue to believe that the economy is positioned to expand at a noticeably better pace than it has during the past year, though the timing and the extent of that remains uncertain."

McTeer, 07.08.03

"When I think of it by sector, like you're making me do now, it feels pretty pessimistic because it's pretty easy to conclude that the consumer's been carrying this thing for so long that there can't be much left," he was quoted as saying. "And it's going to be hard for business fixed investment to come in and substitute for them."

"But if I think about it another way, and think of all the reasons that the overall economy ought to pick up in growth - easy money, easy fiscal policy, a huge tax cut that's just now being implemented, a weaker dollar, a stronger stock market - all those things make me feel pretty positive."

Broadus, 29.10.03

In any event, he said, economic growth appeared to have accelerated to an annual pace around 5.5 percent in the third quarter, adding: "And there are at least a few preliminary signs that the weakness in the job market is abating."

Greenspan, 12.03.04

"As our economy exhibits increasing signals of recovery, job loss continues to diminish," the Fed chief said in prepared remarks for delivery to a financial conference at Boston College. "In all likelihood, employment will begin to increase more quickly before long as output continues to expand."

Gramlich, 16.09.04

"The worst possible outcome is for monetary policy to let inflation come loose from its moorings."

Gramlich, 23.09.04

Asked following a speech if large government borrowing needs could fuel price increases, Gramlich said, "It could if you don't have a credible central bank."

Ferguson, 03.11.05

"Given the persistence of high energy prices that the global economy has confronted of late, policymakers cannot be complacent."

"Central bankers must reinforce their credibility and validate the confidence of market participants by actively leaning against inflationary pressures long before inflation itself builds."

Bernanke, 21.03.06

"Broadly speaking I think that consumer finances are consistent with continued reasonable growth in consumption and enough to keep the economy at or close to its potential output growth rates."

Stern, 04.05.06

"The outlook for the American economy is very, very promising, certainly for the rest of this year and for 2007."

"In my opinion, core inflation will remain historically low."

Handelsblatt said Stern did not expect that any further interest rate rises would harm the economy.

"The US economy is not fragile, but rather very flexible and resilient," he was quoted as saying. "We are now in the fifth year of an expansion and for me, it looks as though it is going to continue for quite a while."

Bies, 04.05.06

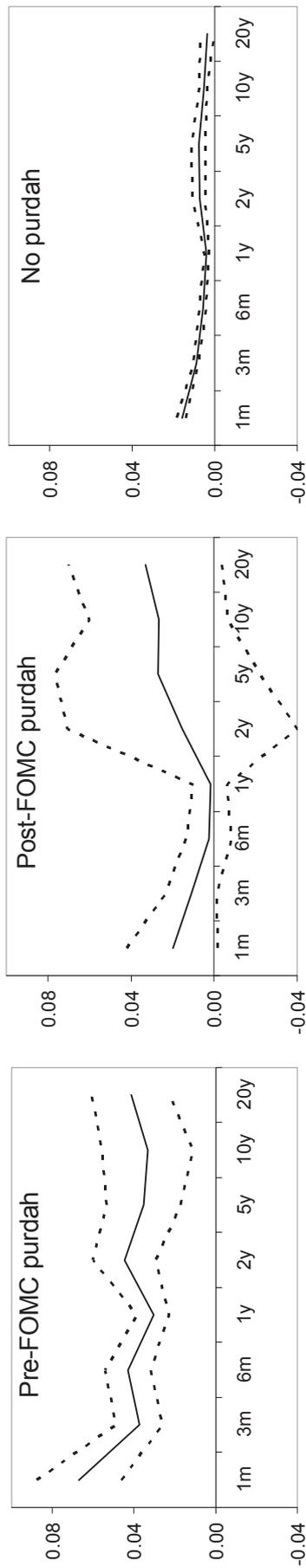
"We've come through a period of weaker rents. Now, housing has really sort of peaked ... that may rejuvenate rents and so you may see that, in turn, higher (CPI) inflation going forward."

Bies said, however, the Fed focuses more heavily on the core personal consumption expenditures price index than the CPI.

Lacker, 22.06.07

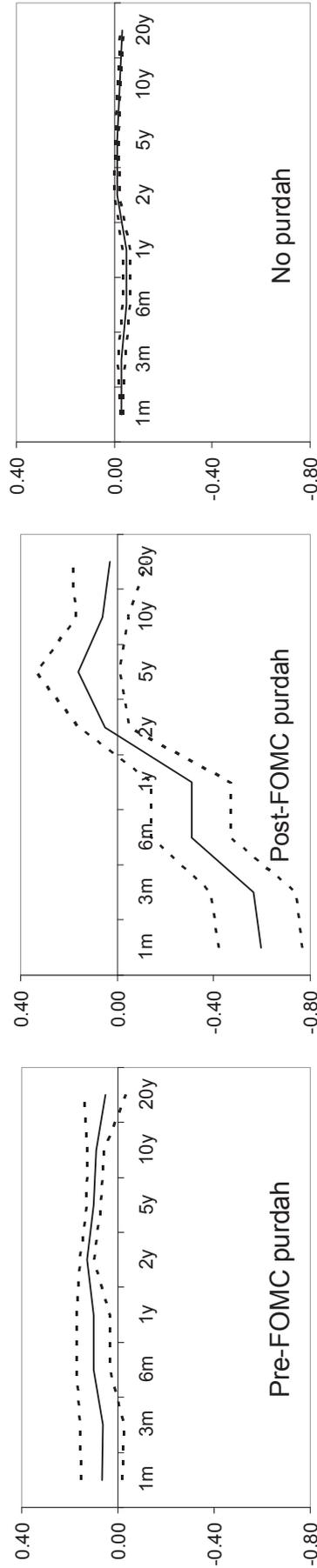
"While still relatively low by historical standards, I view that number -- and, more importantly, the upward trend in inflation -- with some caution. Inflation is, in my opinion, too high."

Figure 1: Effect of communication – Conditional mean across yield curve



Note: The figure shows the EGARCH estimates for the effect of statements in the pre-FOMC purdah, the post-FOMC purdah, and outside the purdah on the conditional mean of the different maturities of US interest rates ranging from 1-month to 20-year rates. Dashed lines indicate 90% confidence intervals.

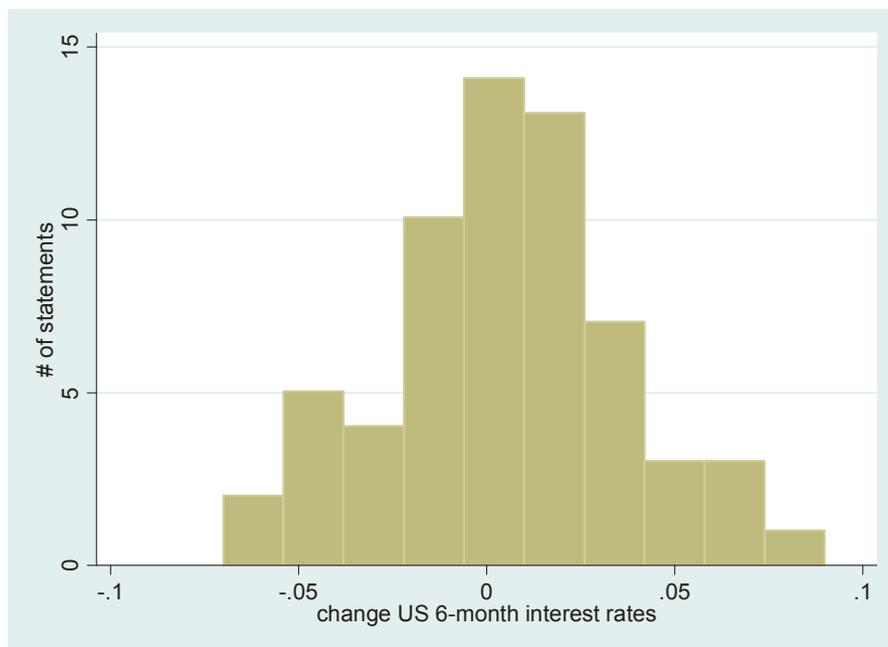
Figure 2: Effect of communication – Conditional variance across yield curve



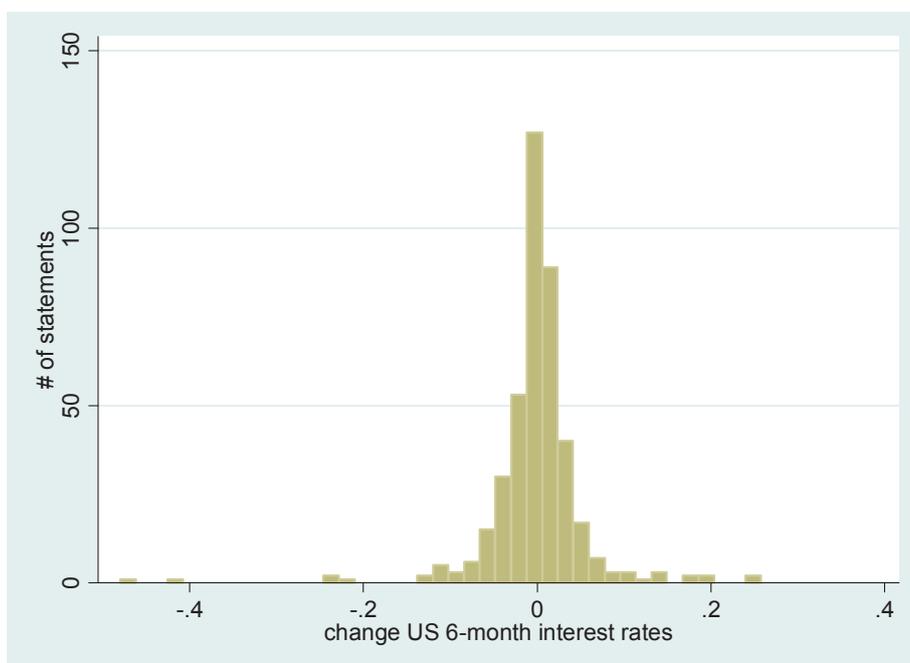
Note: The figure shows the EGARCH estimates for the effect of statements in the pre-FOMC purdah, the post-FOMC purdah, and outside the purdah on the conditional variance of the different maturities of US interest rates ranging from 1-month to 20-year rates. Dashed lines indicate 90% confidence intervals.

Figure 3: Distribution of 6-month interest rate changes on FOMC communication days, 1994-2007

3.A Communication days during purdah period



3.B Communication days outside of purdah period



Note: The histograms are based on the full sample period 1994-2007 as shown in Table 1.

Table 1: Summary statistics for communication by FOMC members

	Full sample	Split sample		
	1994-2007	1994-2000	2001-2007	of which: 2005-2007
Total number of :				
scheduled FOMC meetings	106	55	51	20
No purdah statements	415	139	276	140
Pre-FOMC purdah statements	46	31	15	2
Post-FOMC purdah statements	16	10	6	1
% share of FOMC meetings with purdah statements				
All purdah	42.5%	52.7%	31.4%	15.0%
Pre-FOMC purdah	34.0%	43.6%	23.5%	10.0%
Post-FOMC purdah	14.2%	16.4%	11.8%	5.0%

Note: The table shows, for the entire sample period February 1994 to June 2007, and various sub-periods, the number of FOMC meetings and of statements recorded (separately for the different inter-meeting sub-periods), as well as the share of FOMC meetings for which communication was recorded in the respective purdah periods. Note that for the % shares, numbers for “pre-FOMC purdah” and “post-FOMC purdah” do not add up to “all purdah” as in some instances purdah statements occurred in the purdah before *and* after the same FOMC meeting.

Table 2: Effect of communication on interest rates

	coef.	std.err.	significance vs.		
			(1)	(2)	(3)
MEAN					
(1) Pre-FOMC Purdah	0.043 ***	0.008		y	y
(2) Post-FOMC Purdah	0.002	0.008	y		
(3) No-Purdah	0.006 ***	0.001	y		
VOLATILITY					
(1) Pre-FOMC Purdah	0.102 **	0.042		y	y
(2) Post-FOMC Purdah	-0.307 ***	0.099	y		y
(3) No-Purdah	-0.050 ***	0.009	y	y	

Note: The table shows the EGARCH estimates of the effects of statements in the pre-FOMC purdah, the post-FOMC purdah, and those outside the purdah period on the conditional mean and the conditional variance for US 6-month interest rates. ***, **, * indicate significance at the 99%, 95% and 90% levels, respectively. “y” indicates that the coefficient in a given row is significantly (at the 90% level) different from the corresponding coefficient in the row indicated by the number in brackets in the table header.

**Table 3: Effect of communication –
Characteristics of FOMC policy decisions and market uncertainty**

POLICY CHANGE NEXT FOMC MEETING					
	NO		YES		sig.
	coef.	std.err.	coef.	std.err.	
MEAN					
Pre-FOMC Purdah	0.036 ***	0.012	0.044 ***	0.003	
Post-FOMC Purdah	0.004	0.040	0.013	0.012	
No-Purdah	0.009 ***	0.002	0.008 ***	0.001	
VOLATILITY					
Pre-FOMC Purdah	0.181 **	0.077	-0.042	0.085	y
Post-FOMC Purdah	-0.327 ***	0.124	-0.678 ***	0.208	
No-Purdah	-0.022	0.019	-0.053 ***	0.011	
POLICY SURPRISE LAST FOMC MEETING					
	NO		YES		sig.
	coef.	std.err.	coef.	std.err.	
MEAN					
Pre-FOMC Purdah	0.081 ***	0.016	0.045 ***	0.015	y
Post-FOMC Purdah	0.009	0.013	0.506 ***	0.000	y
No-Purdah	0.010 ***	0.001	0.008 ***	0.002	
VOLATILITY					
Pre-FOMC Purdah	0.256 ***	0.064	-0.329 **	0.128	y
Post-FOMC Purdah	-0.419 ***	0.117	-1.129 ***	0.417	y
No-Purdah	0.003	0.010	-0.078 ***	0.026	y
INTEREST RATE VOLATILITY					
	LOW		HIGH		sig.
	coef.	std.err.	coef.	std.err.	
MEAN					
Pre-FOMC Purdah	0.044 ***	0.016	0.074 **	0.032	
Post-FOMC Purdah	0.012	0.013	0.003	0.041	
No-Purdah	0.008 ***	0.001	0.026 ***	0.002	y
VOLATILITY					
Pre-FOMC Purdah	-0.254 ***	0.078	0.684 ***	0.078	y
Post-FOMC Purdah	-0.576 ***	0.181	-0.461 ***	0.129	
No-Purdah	-0.057 ***	0.009	0.061 **	0.030	y

Note: Distinguishing between FOMC meeting characteristics, the table shows the EGARCH estimates of the effects of statements in the pre-FOMC purdah, the post-FOMC purdah, and those outside the purdah period on the conditional mean and the conditional variance for US 3-month interest rates. An interest rate surprise is defined to be present whenever the unexpected component of an FOMC decision – measured as the mean of Reuters survey expectations – exceeds its sample mean (which is 3.7 basis points over the whole sample period). Interest rate volatility is measured as the standard deviation of daily movements of 3-month rates in the inter-meeting period before the purdah. “High” volatility is defined for each period when this variable exceeds its sample mean over the whole period, and “low” when it is below. ***, **, * indicate significance at the 99%, 95% and 90% levels, respectively. “y” indicates that the two respective coefficients in each row are significantly different at the 90% level.

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