Online Appendix: Are Sticky Prices Costly? Evidence From The Stock Market

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Not for Publication

We include in this appendix a number of details and robustness checks that are omitted in the main text for brevity.

I Firm and Industry Level Controls

In this section we detail our data sources and define the control variables.

Balance sheet data are obtained from the Standard and Poor's Compustat database. We define book equity (BE) as total shareholders' equity plus deferred taxes and investment tax credit (Compustat item TXDITCQ) minus the book value of preferred stock (Compustat item PSTKQ). We prefer the shareholders' equity numbers as reported by Compustat (Compustat item SEQQ). In case this data are not available, we calculate shareholders' equity as sum of common and preferred equity (Compustat items CEQQ and PSTKQ). If neither of the two are available, we define shareholders' equity as the differences of total assets and total liabilities (Compustat items ATQ and LTQ).

The book to market (BM) ratio of event t is then the log of the ratio of book equity for the fiscal quarter ending at least three months before the event date over the market capitalization of the previous trading day. Market capitalization is number of shares outstanding times the closing price (CRSP items SHROUT and PRC). $Size$ is the natural logarithm of the market capitalization as of the previous trading day.

We define labor share (*labor share*) as total staff expenses (Compustat item XLR) over net sales (Compustat item SALE). Staff expense data are only sparely available on Compustat. Price to cost margin (PCM) is the ratio of net sales minus costs of goods sold (Compustat item COGS) to net sales. *std sale* is the volatility of annual growth in net sales on a quarterly basis. Fixed costs to sales ($FC2Y$) is defined as the sum of selling, general and administrative expenditures (Compustat item XSGA), advertising (Compustat item XAD) and research and development expenses (Compustat item XRD)

over net sales. Receivables minus payables to sales ($RecPay2Y$) is total receivables minus total trade payables (Compustat items RECT and AP) over net sales, investment to sales ($I2Y$) is capital expenditures (Compustat item CAPX) to net sales, and depreciation to assets ($D2A$) is depreciation and amortization (Compustat item DP) over total assets (Compustat item AT). These variables are all averaged across our sample period.

Profitability is operating income before depreciation (Compustat item OIBDPQ) over lagged total assets where both variables are measured on a quarterly basis. Rating (Rat) is the S&P domestic long term issuer credit rating (Compustat item SPLTICRM). We assign the highest rating category, AAA, a value of 4.33, decreasing by 1/8 with every rating notch. We use mean ratings within the year and lag them by 1 year.

We also include the Kaplan - Zingales index (KZ, Kaplan and Zingales (1997)) to control for the impact of financial constraints. This index is defined as:

$$KZ_{it} = -1.002\frac{CF_{it}}{AT_{it-1}} - 39.368\frac{Div_{it}}{AT_{it-1}} - 1.315\frac{C_{it}}{AT_{it-1}} + 3.139Lev_{it} + 0.283Q_{it}, \qquad (1)$$

where cash flow (CF) is the sum of income before extraordinary items (Compustat item IB) and depreciation and amortization, dividends (Div) are measured as common and preferred dividends (Compustat items DVC and DVP), C is cash and short term investments (Compustat item CHE), leverage (Lev) is the ratio of long term debt and debt in current liabilities (Compustat items DLTT and DLC) to stockholders' equity (Compustat item SEQ), long term debt and debt in current liabilities and Q is the ratio of total assets, the market value of equity from CRSP as of fiscal year end, minus the bookvalue of equity and deferred taxes (Compustat items CEQ and TXDB) to total assets. The first three variables are normalized by lagged total assets. We winsorize all variables at the 1% level before calculating the index and use one-year lagged values of the index in our regressions.

Four- and eight-firm concentration ratios ($4F - conc\ ratio$ and $8F - conc\ ratio$) are the means of the concentration ratios at the industry level over the years 1997, 2002, and 2007 as reported by the Census Bureau. We assign firms into categories of final demand based on their durability of output using the industry classification of Gomes, Kogan, and Yogo (2009). They use the 1987 benchmark input-output accounts to assign industries to the classes of final demand to which they have the highest value added: personal consumption expenditure on non-durable goods ($nondur$), durable goods (dur)

and services ($serv$), gross private domestic investment ($invest$), government expenditure and gross investment (gov), as well as net export of goods and services (nx).

Engel curve slopes ($engel$) and a different measure of durability of output ($dura$, in years) at the industry level are from Bils, Klenow, and Malin (2012). They estimate Engel curve slopes using the micro data underlying the U.S. Consumer Expenditure Surveys Interview Surveys, pooling cross sections from 1982 to 2010. They employ life expectancy tables from a property casualty insurer and estimates from the U.S. Bureau of Economic Analysis to measure durability of output at the industry level.

The frequency of wage adjustment (FWA) at the industry level is from Barattieri, Basu, and Gottschalk (2014). They measure the frequency of nominal wage adjustment using SIPP data adjusted for measurement error.

$export$ is the ratio of sales from foreign operations (export plus FDI) from the Compustat segments file to total sales.

In a robustness test, we use CAPM as well as Fama and French adjusted returns as left-hand-side variables. We calculate factor loadings as full sample time series coefficients of monthly excess returns on the factors. We construct Fama and French factor returns for our 30 minutes event window as in Fama and French (1993) using our sample of firms.

II Dynamic General Equilibrium Model

This section discusses our calibrated mutli-sector New Keynesian model in greater detail. For more information, we refer directly to Carvalho (2006). In this model, a representative household lives forever. The instantaneous utility of the household depends on consumption and labor supply. The intertemporal elasticity of substitution for consumption is σ. Labor supply is firm-specific. For each firm, the elasticity of labor supply is η. The household's discount factor is β. Households have a love for variety and have a CES Dixit-Stiglitz aggregator with the elasticity of substitution θ.

Firms set prices as in Calvo (1983). There are k sectors in the economy with each sector populated by a continuum of firms. Each sector is characterized by a fixed λ_k, the probability of any firm in industry k to adjust its price in a given period. The share of firms in industry k in the total number of firms in the economy is given by the density function $f(k)$. Firms are monopolistic competitors and the elasticity of substitution θ is the same for all firms both within and across industries. While this assumption is

clearly unrealistic, it greatly simplifies the algebra and keeps the model tractable. The production function for output Y is linear in labor N which is the only input. The optimization problem of firm j in industry k is then to pick a reset price X_{jkt}:

$$\max \mathbb{E}_t \quad \sum_{s=0}^{\infty} Q_{t,t+s}(1-\lambda_k)^s [X_{jkt} Y_{jkt+s} - W_{jkt+s} N_{jkt+s}] \tag{2}$$

$$s.t.\ Y_{jkt+s} = N_{jkt+s} \tag{3}$$

$$Y_{jkt+s} = Y_{t+s}\left(\frac{X_{jkt}}{P_{t+s}}\right)^{-\theta} \tag{4}$$

$$Q_{t,t+s} = \beta^s \left(\frac{Y_{t+s}}{Y_t}\right)^{-\sigma} \tag{5}$$

where variables without subscripts k and j indicate aggregate variables, W is wages (taken as given by firms) and Q is the stochastic discount factor. Wages paid by firms are determined by the household's optimization problem:

$$\frac{W_{jkt}}{P_t} = \frac{N_{jkt}^{1/\eta}}{C_t^{-\sigma}}. \tag{6}$$

The aggregate price level and output are given by:

$$P_t = \left(\int_0^1 f(k) P_{kt}^{(1-\theta)} dk\right)^{1/(1-\theta)}, P_{kt} = \left(\int_0^1 P_{jkt}^{(1-\theta)} dj\right)^{1/(1-\theta)}, \tag{7}$$

$$Y_t = \left(\int_0^1 f(k)^{1/\theta} Y_{kt}^{(\theta-1)/\theta} dk\right)^{\theta/(\theta-1)}, Y_{kt} = f(k)\left(\int_0^1 Y_{jkt}^{(\theta-1)/\theta} dj\right)^{\theta/(\theta-1)}. \tag{8}$$

The central bank follows an interest rate rule:

$$i_t = \left(\frac{P_t}{P_{t-1}}\right)^{\phi_\pi} \left(\frac{Y_t}{Y_{t-1}}\right)^{\phi_y} \beta^{-1} \exp(mp_t) \tag{9}$$

$$mp_t = \rho_{mp} mp_{t-1} + v_t \tag{10}$$

where $exp(i_t)$ is the nominal interest rate, ϕ_π and ϕ_y measure responses to inflation and output growth, and v_t is an i.i.d. zero-mean policy innovation.

After substituting in optimal reset prices and firm-specific demand and wages, the

value of the firm V with price P_{jkt} is given by:

$$V(P_{jkt}) = \mathbb{E}_t\left\{Y_t^{\sigma} P_t\left[\Delta_{kt}^{(1)}\left(\frac{P_{jkt}}{P_t}\right)^{1-\theta} - \Delta_{kt}^{(2)}\left(\frac{P_{jkt}}{P_t}\right)^{-\theta(1+1/\eta)} + \Upsilon_{kt}^{(1)} - \Upsilon_{kt}^{(2)}\right]\right\} \quad (11)$$

$$\Upsilon_{kt}^{(1)} = \lambda_k \beta\left(\frac{X_{k,t+1}}{P_{t+1}}\right)^{1-\theta} \Delta_{kt+1}^{(1)} + \beta\Upsilon_{kt+1}^{(1)} \quad (12)$$

$$\Delta_{kt}^{(1)} = Y_t^{1-\sigma} + \beta(1-\lambda_k)\left(\frac{P_{t+1}}{P_t}\right)^{\theta-1} \Delta_{kt+1}^{(1)} \quad (13)$$

$$\Upsilon_{kt}^{(2)} = \lambda_k \beta\left(\frac{X_{k,t+1}}{P_{t+1}}\right)^{-\theta(1+1/\eta)} \Delta_{kt+1}^{(2)} + \beta\Upsilon_{kt+1}^{(2)} \quad (14)$$

$$\Delta_{kt}^{(2)} = Y_t^{1+1/\eta} + \beta(1-\lambda_k)\left(\frac{P_{t+1}}{P_t}\right)^{\theta(1+1/\eta)} \Delta_{kt+1}^{(2)}. \quad (15)$$

III Additional Results

As discussed in the main body of the paper, we calculate the frequency of price adjustment as the mean fraction of months with price changes during the sample period of an item. Because the collected data may have missing values, we construct different measures for the frequency of price adjustment, FP. In the first approach, labeled A, we treat missing values as interrupting price spells. For example, if a price was \$4 for two months, then misses for a month, and is again observed at \$5 for another three months, we treat the data as reporting two price spells with durations of two and three months where none of the spells have a price change and hence the frequency is zero. In the second approach, labeled B, missing values do not interrupt price histories. In the previous example, approach B concatenates spells of \$4 and \$5 prices and yields one price change in five months so that the frequency is 1/5. Approach C takes the union of A and B, that is, there is a price change if either A or B identifies a price change. We employ approach FPA in the main paper, weighting item based frequencies equally. Results are very similar if we make use of these alternative measures.

Figure 1 plots the futures-based expected federal funds rate for additional event dates.

On August 8, 2006, the FOMC decided to stop increasing the federal funds target rate. Until then, the FOMC had been increasing the policy target for more than two years for a total of seventeen increases of 25 bps. This had been the longest streak of increases since the change in market communication in 1994. The FOMC had clearly

signalled a pause in previous press releases and according to the financial press around the event, the market also expected this break. Still, the federal funds futures indicate that market participants saw a small chance – potentially due to statements of Jeffrey Lacker, then-President of the Federal Reserve Bank of Richmond, who was opposing the pause – of a further increase resulting in a negative monetary policy surprise of 4.77 bps. This episode shows that policy surprises do not necessarily require changes in the policy rate.

On September 18, 2007, the FOMC cut the target rate by 50 bps, the first cut since 2003. Market participants expected a monetary policy easing. Motivated by weakening economic growth and turmoil in the subprime housing sector, the FOMC considered this step necessary to prevent a credit crunch. The aggressiveness of this decision, though, seemed to surprise the market, resulting in an unexpected change in the federal funds rate of about 20 bps.

On March 18, 2009, the FOMC took further measures in its attempts to ease the uproar on Wall Street after the fall of Bear Stearns. According to Fed watchers, estimates were ranging from a 50 to 125 bps rate cut. On average, market participants expected a cut by 85 bps. The actual cut of 75 bps hence led to a positive surprise of 10 bps. This example shows that surprises in the federal funds rate and changes in the federal funds rate do not necessarily go into the same direction.

Figure 2 shows the observed level of policy inertia and interest rate smoothing.

Figure 3 is a scatterplot of monetary policy shocks in the tight event window on the x-axis and the wide event window on the y-axis. Almost all 137 observations line up perfectly along the 45°line. August 17, 2007, and December 16, 2008, are the only two exceptions. The first observation is an intermeeting event day on which the FOMC unexpectedly cut the discount rate by 50 bps at 8.15am ET just before the opening of the open-outcry futures market in Chicago. The financial press reported heavy losses for the August futures contract on that day and a very volatile market environment. The second observation, December 16, 2008, is the day on which the FOMC cut the federal funds rate to a target range between 0 and 0.25 percent. Table 1 reports mean probabilities, standard deviations, and the number of firm-event observations for these different measures of the frequency of price adjustment, both for the total sample and for each industry separately. Results are very similar across the various measures.

Table 2 documents the effects of monetary policy shocks on the return of the S&P500 to ensure that these shocks are a meaningful source of variation.

Tables 3 – 7 repeat the analyses of Table 4 Panel A in the main body of the text for different measures of price stickiness. Results are comparable across our different measures.

In Table 8, we replicate Table 5 for Fama-French-adjusted returns. While adjusted returns capture only a part of the effect of sticky prices on conditional volatility, we still find a negative coefficient on the interaction term between the frequency of price adjustment on conditional stock volatility across specifications. Coefficients are smaller in magnitude compared to Table 5, but relative magnitudes are comparable.

In Table 9, we show that our results are robust to using different thresholds for the exclusion of outliers. In our baseline specification, we exclude all observations which move the point estimate of the sensitivity (the coefficient on the interaction term $v_t^2 \times FPA$) by more than $0.10 \times$ standard error of the estimate. The table shows that the coefficient on the interaction term is similar, but somewhat larger (in absolute terms) when we impose a more stringent threshold, i.e. when we exclude more outliers.

In Table 10, we document that the coefficient on the interaction term remains stable and highly statistically significant when we exclude one industry at a time.

We show in Table 11 that our non-parametric results are not driven by industry-level differences in the frequency of price adjustment (FPA). Indeed, we know from Table 1 of the main paper that there is substantial heterogeneity in FPA within industry. In the first version of the non-parametric sort (columns (1) - (5)), we sort firms on industry-adjusted frequencies; that is, we subtract the industry average FPA from a firms' FPA and then sort firms on demeaned FPA. In the second version of the non-parametric sort, we first sort firms in quintiles within industries and then pool quintiles across industries (columns (6)-(10)); that is, the first quintile of the pooled data is the first quintile of industry A, the first quintile of industry B, etc. Sensitivities to squared shocks range from 130.7 for quintile 1 to 74.04 for quintile 5 for the first version of the sort and from 136.0 for quintile 1 to 69.18 for quintile 5 for the second version of the sort. These magnitudes are similar to what we report in the baseline table.

IV Additional descriptive statistics

Since we focus only on large S&P500 firms and hence our sample may be different from samples studied in previous work, we provide additional information about key moments in the data (subject to confidentiality constraints). Figure 4 plots the histogram of the frequency of price adjustment. There is significant heterogeneity. The distribution has substantial mass at low frequencies, but also a large right tail.

Figures 5 and 6 plot the histogram of the absolute size of log price changes with and without sales. Since sales are rare in the PPI data, the plots are similar. While there are many small price changes, the mean size of absolute price changes is about 9% when sales are included and 11% when sales are included. The distribution also has a heavy right tail, which is consistent with previous studies (see e.g. Midrigan (2011)) showing that the distribution of price changes is leptokurtic.

Figure 7 is a histogram of the number of products per firm in the PPI micro data. The mean number of products per firm is 110, but there is a lot of heterogeneity. Some firms have more than 400 products. This large number of products reflects the fact that S&P500 firms are large, and since BLS samples prices based on firm size (a higher sampling probability is assigned to larger firms/establishments), we have considerable presence of units of these firms in the PPI sample.

Figure 8 is a histogram of the degree of synchronization of price adjustment at the firm level. The amount of variation is similar to that for the frequency of price adjustment. The plot also shows that, in general, price changes are not perfectly synchronized within firms/establishments.

Table 15 contains descriptive statistics of the various firm characteristics and explanatory variables used in our regression analysis in Panel A and pairwise correlations in Panel B. Focusing on the correlations of the frequency of price adjustment, FPA, with the various variables, we see that more flexible price firms tend to have lower price-to-cost margins, lower betas, lower labor shares, and lower Engel curve slopes, but have higher book to market ratios, are more financially constrained according to the Kaplan - Zingales index, and have higher investment ratios and higher capital intensities. As for durability, we see that our two classifications lead to correlations with opposite signs. We should point out, however, that none of these correlations is larger than 0.3 in absolute value.

Table 16 contains dates and exact times stamps of the FOMC press releases, actual changes in the federal funds target rates and a decomposition of the actual changes into the expected and unexpected parts as described in the main paper.

V Measurement errors

While we have many observations per firm to calculate the frequency of price adjustment at the firm level, we want to explore how measurement errors can affect our results.

As a first pass, we split the original PPI sample into two subsamples of approximately equal sizes. For a given product/establishment level, we randomly draw (without replacement) a price spell and assign it to one of the subsamples. Then for each subsample, we apply our procedure to calculate the frequency of price adjustment. Given that BLS rotates and randomly samples products and establishments, one can expect that sampling errors in the two subsamples are not correlated. However, the size of sampling errors in the FPA calculated on a subsample is larger, since for each subsample we use only a half of the data. We find that FPA is highly correlated between samples ($\rho = 0.82$).

In columns (3) through (6) in Table 12, we estimate our baseline specification using the frequency of price adjustment constructed from the two subsamples. Because of larger sampling errors in FPA based on subsamples, the sensitivity of stock market volatility to monetary shocks is attenuated to 0. Such attenuation is consistent with classical measurement errors.

If errors are not correlated across subsamples, then one can correct the attenuation bias by using instrumental variable (IV) estimation. Specifically, one can use FPA from one subsample as an instrumental variable for FPA from the other subsample. Columns (7) through (10) present results for IV estimation. The estimated coefficients are close to what we report in the baseline where we use the full sample to calculate FPA. These results suggest that measurement errors are unlikely to drive our results.

In Table 13, we provide additional results to support this conclusion. We split firms based on the number of products into two halves. One may expect that firms with a larger number of products have smaller measurement errors and thus one can obtain less noisy measures of FPA. However, there are potentially confounding factors in this sample split. As documented by Bhattarai and Schoenle (2014) and others, larger firms

tend to have more frequent price changes. Indeed, we find that the frequency of price changes is positively correlated with the number of products at the firm level ($\rho = 0.2$). We document in the paper that the effect of price stickiness is likely nonlinear and the sensitivity should be smaller for firms with more flexible prices. Hence, there are two opposing forces: reducing measurement errors should increase the estimated sensitivity to monetary shocks, while increasing price flexibility should reduce it. Table 13 shows that the second force weakly dominates the first. These results suggest that even for firms with many products where measurement errors in FPA are likely to be small, we observe the same qualitative relationship between stock return volatility, monetary shocks, and price stickiness. In Table 14, we show that our results are not driven by the tails of FPA distribution in which measurement error could be more concentrated.

Finally, we use our dynamic model from Section V of the main body of the paper to study how measurement errors affect estimated sensitivity. We consider two cases. First, measurement errors are classical and we model these as $FPA_i = FPA_i^* + me_i$ where FPA is measured frequency of price adjustment, FPA_i^* is the true frequency of price adjustment, me_i is the measurement error with $\rho(FPA_i^*, me_i) = 0$. We vary the size of the measurement error and for each size estimate specification (3) in the paper on the simulated data. Figure 9 plots how estimated sensitivity varies with changes in the signal-to-noise ratio. In short, larger measurement errors attenuate estimated sensitivities toward 0. Therefore, if measurement errors are classical, our estimates provide a lower bound on the sensitivity.

Second, measurement errors are mean-reverting and we model these as $FPA_i = FPA_i^* + me_i$ where FPA is measured frequency of price adjustment, FPA_i^* is the true frequency of price adjustment, me_i is the measurement error, but now $\rho(FPA_i^*, me_i)$ can be different from 0 and we vary the degree of correlation. Holding the signal-to-noise ratio fixed at one, Figure 10 shows that a positive correlation tends to attenuate estimates while a negative correlation tends to amplify estimates. However, it takes a very strong negative correlation to have significant movements in the estimated sensitivity and even in the worst case such correlation cannot alter the orders of magnitude and the signs of the estimated sensitivity

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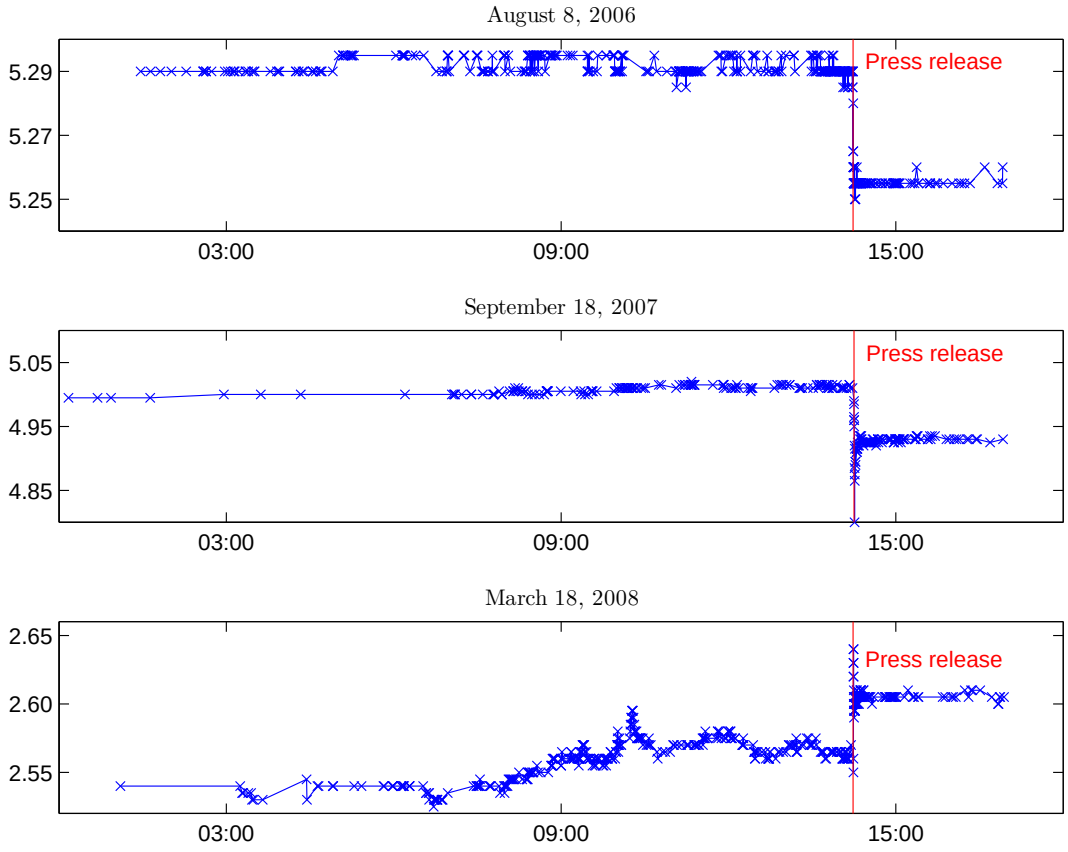
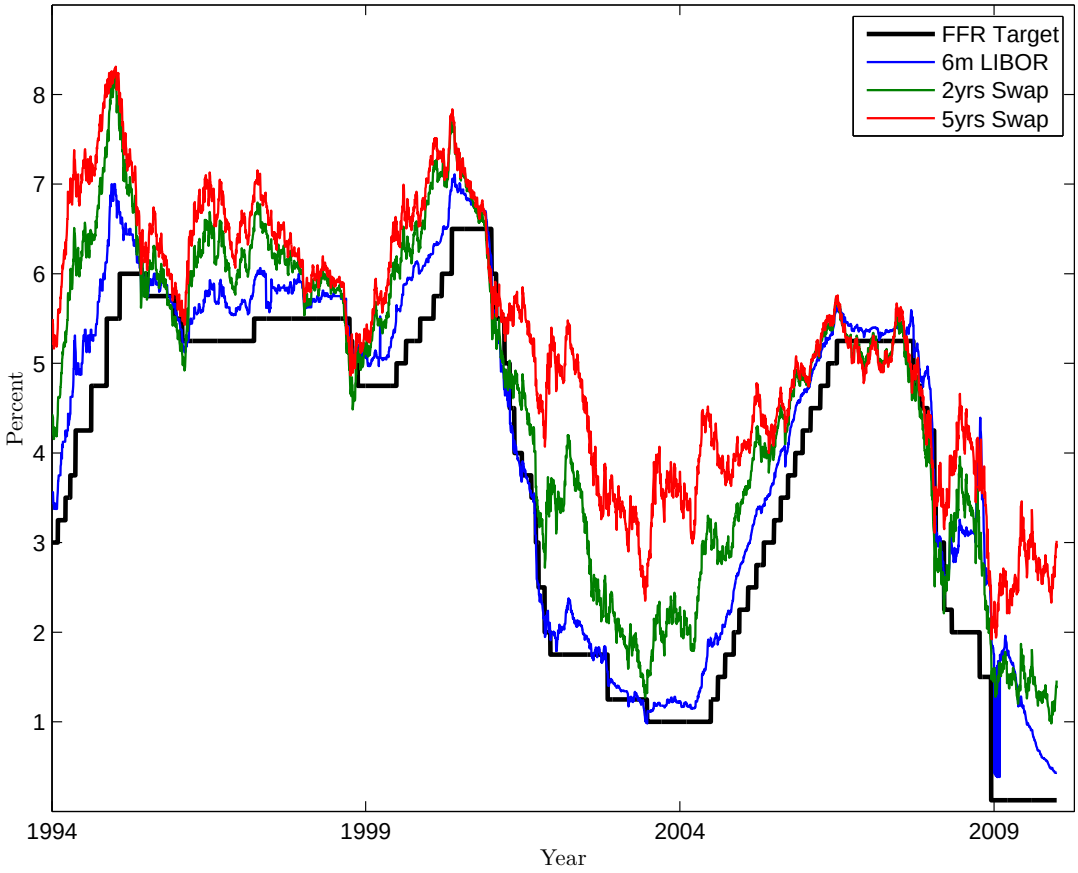
Figure 1: **Intraday Trading in Globex Federal Funds Futures**



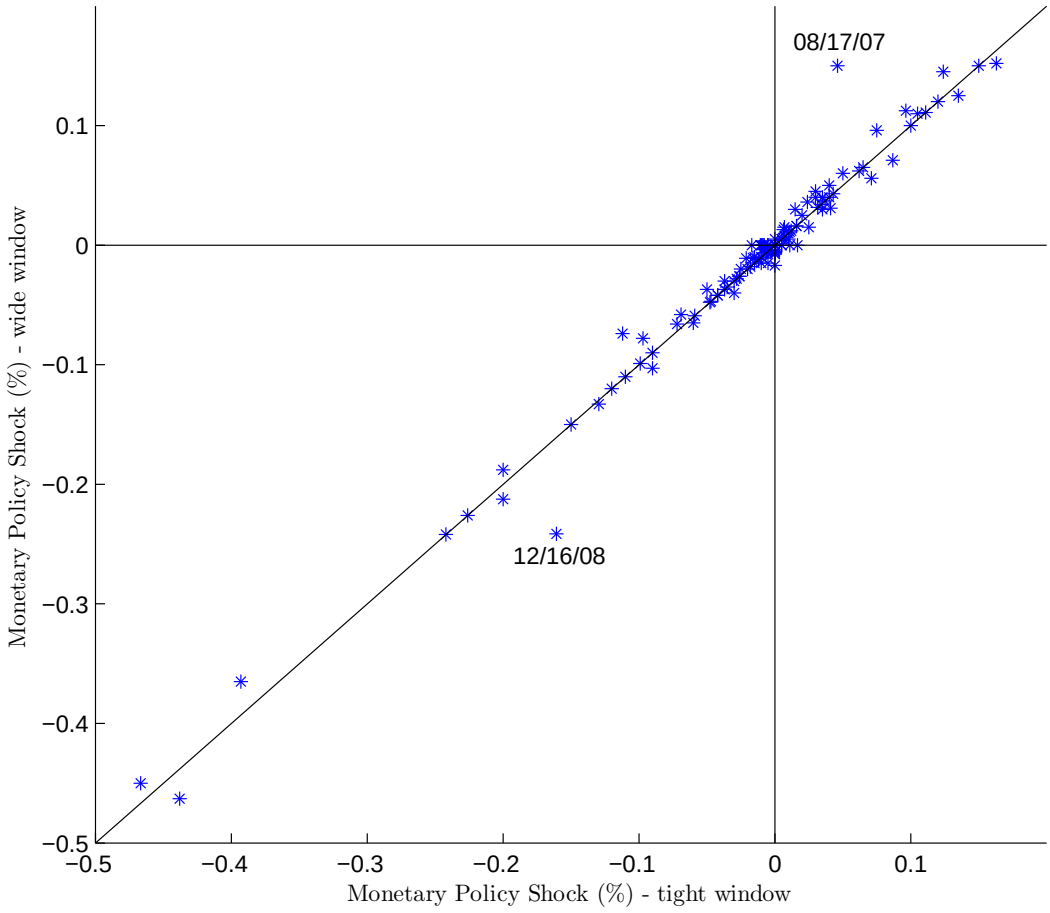
This figure plots the tick–by–tick trades in the Globex Federal funds futures for three different FOMC press release dates with release times at 2:14pm on August 8th 2006, 2:15pm on September 18th 2007 and 2:14pm on March 18th 2008, respectively.

Figure 2: **Time Series of Interest Rates**



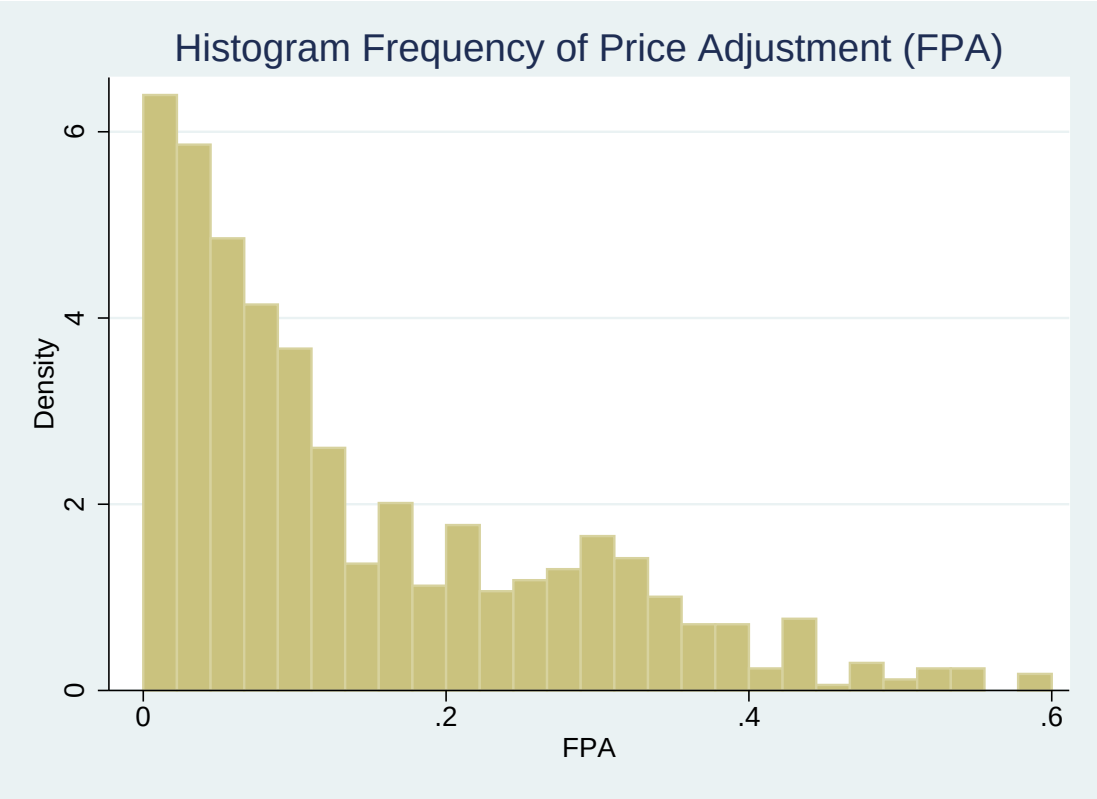
This figure plots the time–series of the federal funds target rate, the six months Libor as well as the two and five year swap rates from 1994 to 2009.

Figure 3: **Futures–based Measure of Monetary Policy Shocks**



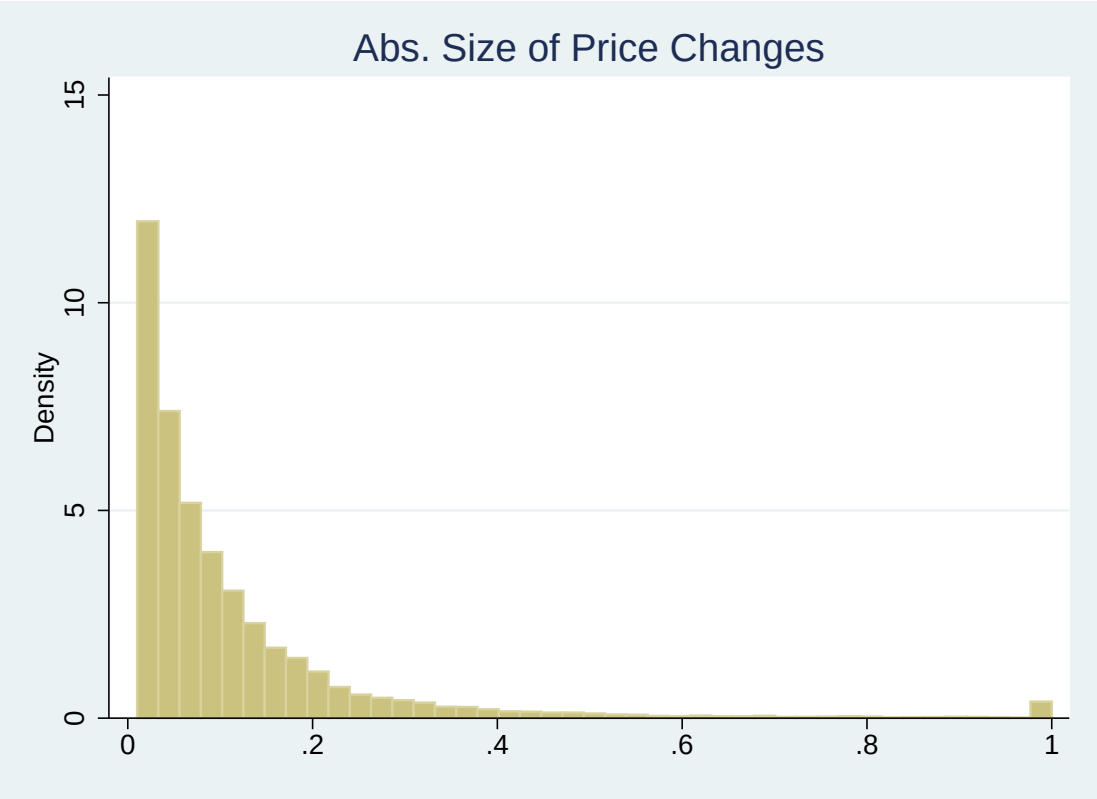
This figure is a scatterplot of the federal funds futures based measure of monetary policy shocks calculated according to equation (2) in the main body of the paper for the wide (60min) event window versus the tight (30min) event window. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations.

Figure 4: **Histogram Frequency of Price Adjustment**



This figure plots the histogram of the frequency of price adjustment.

Figure 5: **Histogram for Absolute Price Changes**

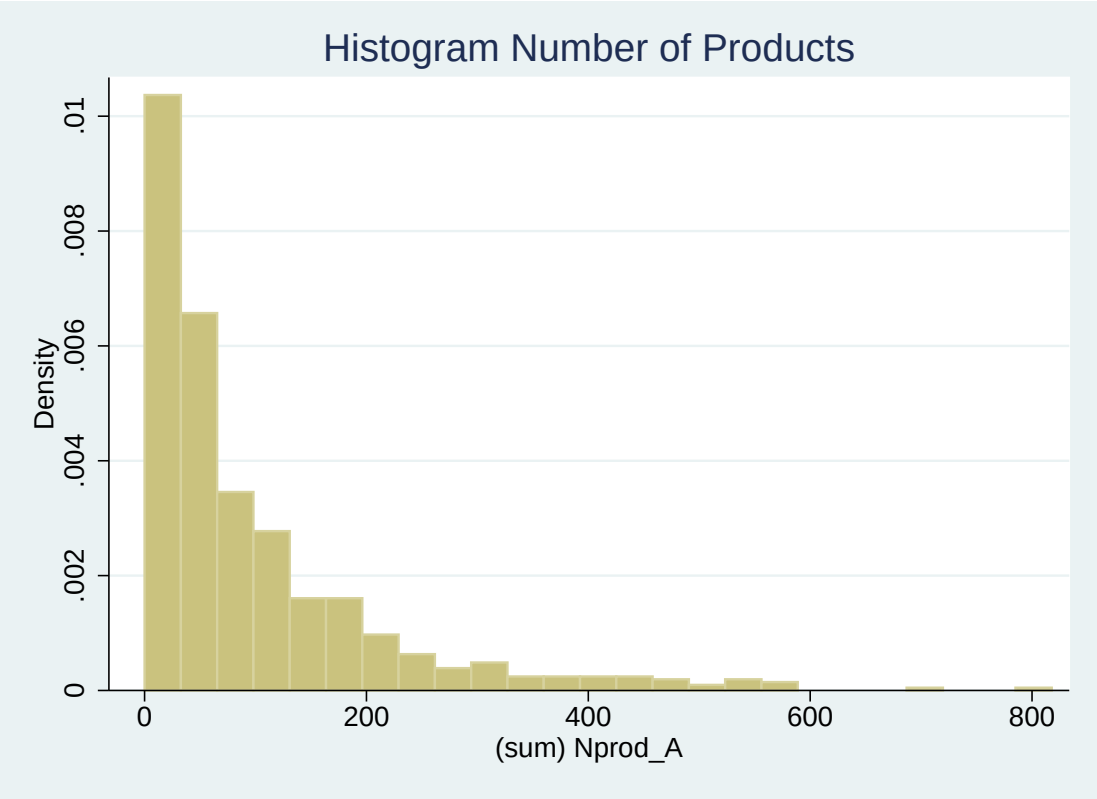


This figure plots the histogram of absolute price changes.

Figure 6: **Histogram for Absolute Price Changes (no sales)**

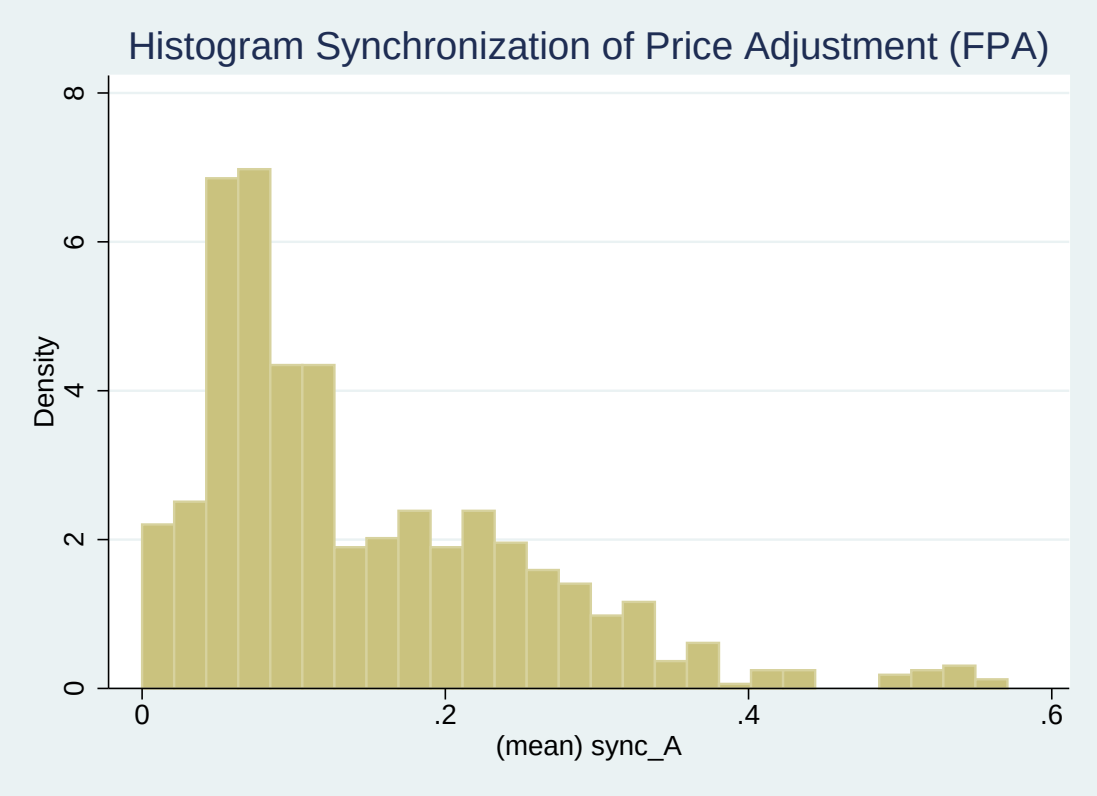
This figure plots the histogram of absolute regular price changes.

Figure 7: **Histogram for Number of Products**



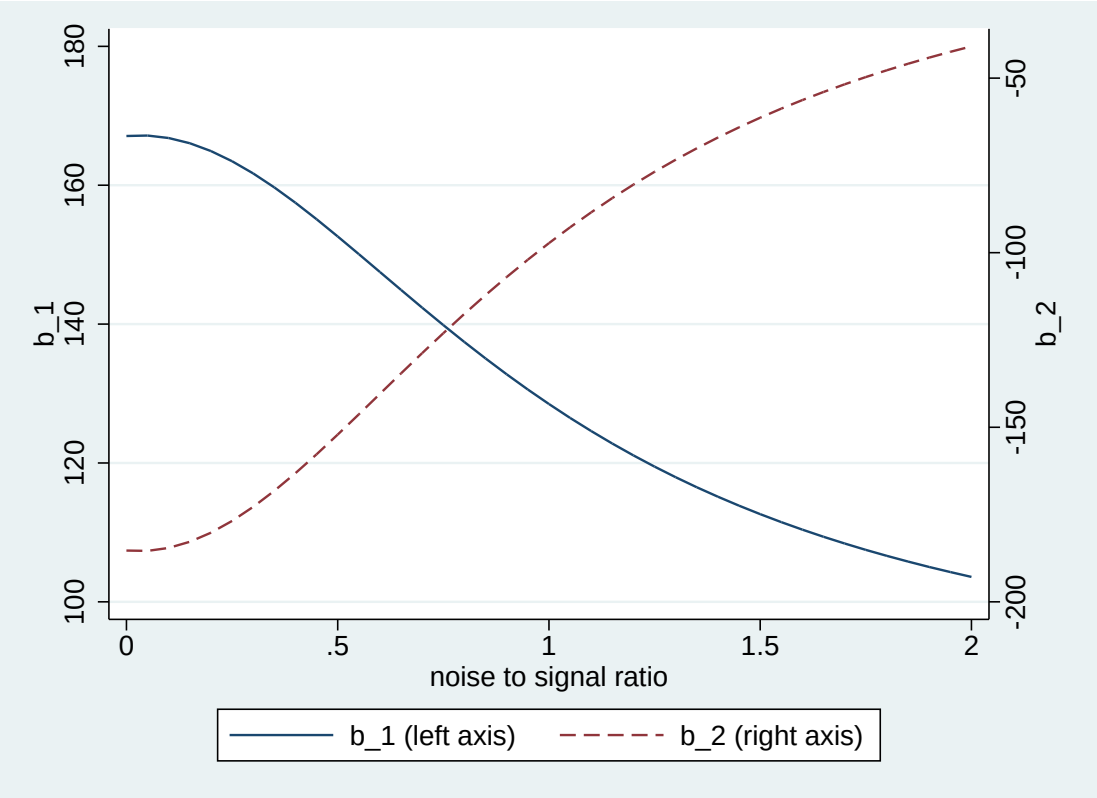
This figure plots the histogram of the number of products.

Figure 8: **Histogram Synchronization of Price Adjustment**



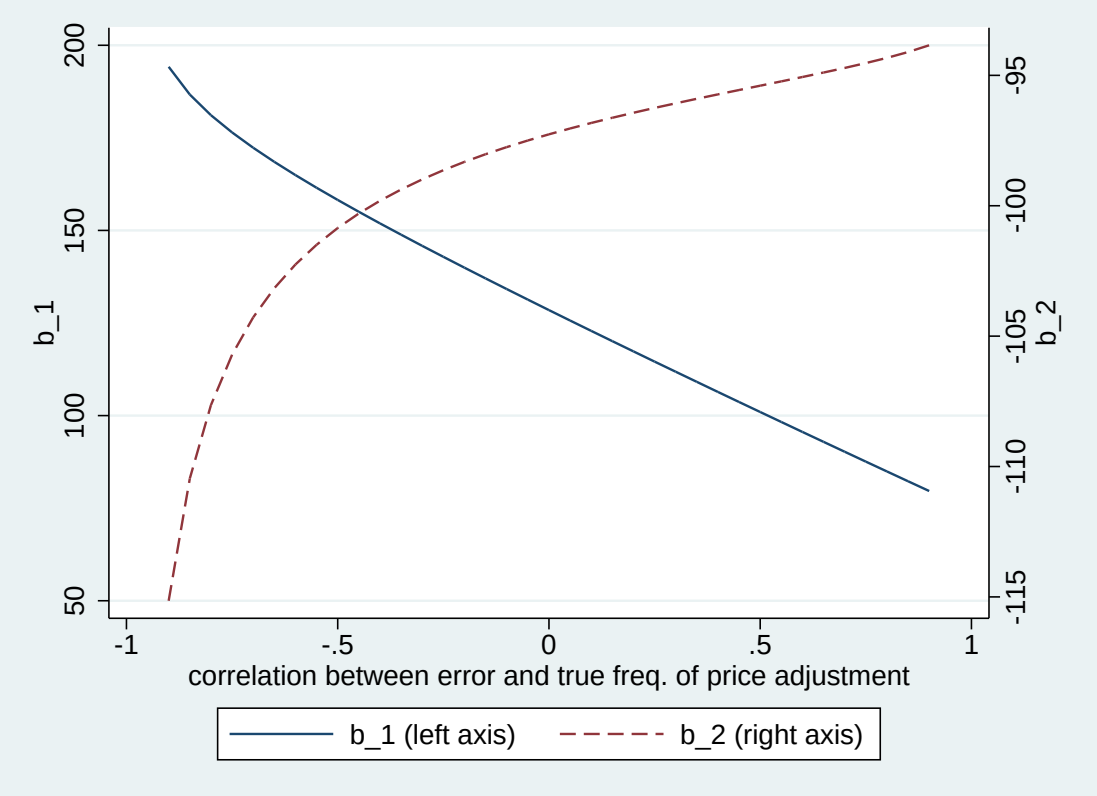
This figure plots the histogram of synchronization of price adjustment. We define price synchronization as the ratio of the number of price changes to the number of price quotes by firm and month.

Figure 9: **Effect of classical measurement error on the estimates of b_1 and b_2 in specification (3)**



This figure shows how estimated sensitivities vary with the size of classical measurement error in simulated data.

Figure 10: **Effect of mean-reverting measurement error on the estimates of b_1 and b_2 in specification (3)**



This figure shows how estimated sensitivities vary with the size of mean-reverting measurement error in simulated data. Mean-reverting measurement errors are modeled as follows: $FPA_i = FPA_i^* + me_i$ *where* $\rho(FPA_i^*, me_i) = \rho \neq 0$. *The signal-to-noise ratio is held constant at 1.*

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This report is authorized by law 29 U.S.C. §2. Your voluntary cooperation is needed to make the results of this survey comprehensive, accurate, and timely.

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Instructions for completing a PPI pricing form:

Item/Service and Transaction Descriptions:

If the Item/Service Description or the Terms of Transaction, or both, no long apply, please select a substitute item/service or transaction terms. Item/service substitution should only occur when the item/service previously reported is no longer available because it is being or has been permanently discontinued. The substitute item/service should be as similar as possible to the current item/service and should be expected to remain available for some time. The substitute transaction terms should likewise be as similar as possible to the discontinued transaction terms.

Report these changes in the closest open area and provide current price information.

Adjustments to Price:

Following is a list of the more common adjustments to price. The specific Adjustments to Price on the pricing form were selected originally and should be changed only when either the level of an existing adjustment changes or a new adjustment becomes applicable to the item/service and transaction described.

Deductions from price include:

1. Standard discounts (Cash, Seasonal, Cumulative Volume, and Trade)
2. Rebates
3. Other recurring discounts
4. Other nonrecurring discounts (Competitive and Negotiated)

Additions to price include:

1. Surcharges
2. Other changes added to price

Taxes should always be excluded from the price. If the excusion is not possible, note this in REMARKS.

Freight changes should be excluded from the price unless delivery was selected originally as part of the product. Make changes if the currently described freight terms no longer exist.

QUESTIONS:

Answer whether charges have (YES) or have not (NO) been made to the Item/Service Description, Terms of Transaction, Adjustments to Price, or Previously Reported Prices.

Answer YES or NO depending on whether the shipment/transaction price of the item/service described changed (YES) between the two dates listed or whether the shipment/transaction price did not change (NO) during the time period. If the answer is NO, the form has been completed and is ready for faxing/mailing.

DO NOT ENTER A PRICE IF THE PRICE HAS NOT CHANGED!

If the answer is YES, please also enter the new price.

Write in any corrections to the terms or the address to whom this form should be sent in the future. Name and address changes need to be made on only one form.

Please complete and return within 5 business days all of the pricing forms even if there are no changes.

If you anticipate a change in any of the information you provide, please indicate in REMARKS. List the anticipated changes and when they will occur.

Any questions you have regarding the pricing form or its completion may be resolved by calling the person listed on the reverse side of this form.

INFORMATION FOR THE PRODUCER PRICE INDEXES

INSTRUCTIONS

THIS FORM IS MACHINE PROCESSED.
Limitations imposed by Bureau processing equipment restrict recognition of blue entries. Please use BLACK pen/pencil only.

This item/service has been selected for use in the Producer Price Index. You are asked to provide a price each month for the item/service described under the terms and adjustments shown.

Please review each section of this form. If your firm no longer sells this specific item/service under the terms and adjustments revise the description, terms, and/or adjustments indicating when the changes were made.

If the change made to the description resulted in a change to your production costs, please provide an estimated value of the change for Bureau staff to use in making appropriate adjustments. This value is the production cost difference including your standard markup.

Further instructions are shown on the reverse side of this form. If you have any questions concerning completion of this fom, please call collect:

202-691-XXXX

Please use the enclosed postage-free envelope or send to: U.S. Department of Labor
Commissioner of Labor Statistics
2 Massachusetts Avenue N.E., Code 47
Washington D.C. 20212-0001

Have the Item/Service Description, Adjustments to Price, Terms of Transaction, or Previously Reported Prices changed since your last report? If 'YES', please also enter the necessary changes.	**YES** ☐	**NO** ☐

ITEM DESCRIPTION

TERMS OF TRANSACTION

TYPE OF SALE:
DOMESTIC/FOREIGN BUYER:
TYPE OF BUYER:
SHIPMENT/CONTRACT TERMS:
SIZE OF SHIPMENT:
UNIT OF MEASURE:

ADJUSTMENTS TO PRICE	**VALUE/TERMS**	**ALREADY APPLIED TO REPORTED PRICE**
TYPE OF DISCOUNT:		
TYPE OF SURCHARGE:		

REMARKS

PRICE INFORMATION

Please review the previously reported prices. Enter missing prices if available or correct any incorrect prices that are shown.

Please enter the current price in the boxes provided ONLY if there has been a change from the price you previously reported.

THE LATEST TYPE OF PRICE REPORTED WAS (Price for actual shipments are desired):

NET TRANSACTION (ACTUAL SHIPMENT)

	PREVIOUSLY REPORTED PRICES	CORRECTIONS
ON January 13, 2009 THE PRICE WAS	$X.XXXX	_____
ON February 10, 2009 THE PRICE WAS	$X.XXXX	_____
ON March 10, 2009 THE PRICE WAS	$X.XXXX	_____
ON April 14, 2009 THE PRICE WAS	$X.XXXX	_____

Did the price change between April 14, 2003 and May 12, 2009? YES ☐ NO ☐
If 'YES', please report the price of the last shipment since May 1
If there was no shipment in May, please estimate the
Price you would have charged on May 12, 2009.

USE BLACK PEN/ PENCIL ONLY. DO NOT USE BLUE.

$ DOLLARS ☐☐☐,☐☐☐,☐☐☐.CENTS ☐☐☐☐

PER JOB

SE/OC MMMMMMMMMMM

REPORTER NAME
REPORTER TITLE
COMPANY NAME
STREET ADDRESS
CITY, STATE
ZIP CODE

Table 1: **Frequency of Price Adjustment by Industry**

This table reports average frequencies of price adjustments at the industry and aggregate levels with standard deviations in parentheses for different measures of the frequency of price adjustment. FPA treats missing values as interrupting price spells; for FPB, missing values do not interrupt price spells if the price is the same before and after periods of missing values. FPC forms the union of the two. Columns (1) to (3) use equally-weighted frequencies of price adjustments, whereas columns (4) to (6) weight frequencies with associated values of shipments. Frequencies of price adjustments are calculated at the firm level using the microdata underlying the Producer Price Index constructed by the Bureau of Labor Statistics.

		FPA	FPB	FPC	FPAW	FPBW	FPCW
		(1)	(2)	(3)	(4)	(5)	(6)
Agriculture	Mean	26.96%	27.67%	27.84%	30.11%	30.85%	31.05%
	Std	17.91%	18.06%	18.23%	19.55%	19.62%	19.83%
	Nobs		52			51	
Manufacturing	Mean	11.57%	12.66%	12.72%	12.40%	13.54%	13.62%
	Std	11.19%	11.35%	11.41%	12.90%	12.98%	13.06%
	Nobs		342			336	
Utilities	Mean	19.12%	20.76%	20.91%	19.89%	21.45%	21.59%
	Std	13.93%	13.50%	13.53%	14.44%	14.06%	14.09%
	Nobs		109			105	
Trade	Mean	19.70%	21.58%	21.69%	20.58%	22.55%	22.66%
	Std	13.50%	13.25%	13.34%	13.39%	12.89%	13.00%
	Nobs		45			44	
Finance	Mean	13.14%	18.57%	18.69%	13.17%	20.06%	20.20%
	Std	11.63%	13.00%	13.11%	12.27%	15.05%	15.19%
	Nobs		138			135	
Service	Mean	8.47%	10.37%	10.42%	8.79%	10.51%	10.56%
	Std	8.85%	9.85%	9.88%	8.89%	9.58%	9.59%
	Nobs		74			70	
Total	Mean	14.17%	16.23%	16.32%	14.97%	17.29%	17.40%
	Std	13.07%	13.39%	13.48%	14.28%	14.77%	14.87%
	Nobs		760			741	

Table 2: **Response of the S&P500 to Monetary Policy Shocks**

This table reports the results of regressing returns and squared returns in percent of the S&P500 in an event window bracketing the FOMC press releases on the federal funds futures based measure of monetary policy shocks calculated according to equation (2) in the main body of the paper, v_t, and the squared shocks, v_t^2, for different event types. Columns (1) to (6) look at a 30 minutes window bracketing the FOMC press releases whereas regressions (7) to (12) consider a 60 minutes event window around the release times. The return of the S&P500 is calculated as a weighted average of the constituents' return in the respective event window, where the market capitilization at the end of the previous trading day is used to calculate the weights. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Robust standard errors are reported in parentheses.

	Returns		Squared Returns				Returns		Squared Returns			
		pre 2005	All	Regular	Turning Point	Intermeeting		pre 2005	All	Regular	Turning Point	Intermeeting
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Constant	−0.08	−0.12∗	0.13	0.23∗∗∗	−0.36	2.68	0.03	−0.04	0.32∗	0.38∗∗∗	0.15	3.44
	(0.06)	(0.05)	(0.13)	(0.05)	(0.77)	(1.64)	(0.07)	(0.06)	(0.16)	(0.09)	(0.67)	(1.46)
v_t	−1.66	−5.31∗∗∗					−1.35	−5.49∗∗∗				
	(2.93)	(1.41)					(2.66)	(1.06)				
v_t^2			84.38∗∗∗	9.57	116.60∗∗∗	67.15			72.46∗	4.27	89.16∗∗∗	57.84
			(23.18)	(8.67)	(9.68)	(38.79)			(28.11)	(6.89)	(10.45)	(45.93)
R^2	0.03	0.44	0.69	0.02	0.92	0.53	0.02	0.42	0.55	0.00	0.88	0.41
Observations	137	92	137	121	8	8	137	92	137	121	8	8

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 3: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (measure FPB)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in a 30 minutes window bracketing the FOMC press releases on the federal funds futures-based measure of monetary policy surprises calculated according to equation (2) in the main body of the paper, v_t^2, the frequency of price adjustment, FPB, as well as their interactions. See specification (3) in the main body of the paper. FPB treats missing values as not interrupting price spells if the price is the same before and after periods of missing values. Equally-weighted frequencies of price adjustments are calculated at the establishment level using the microdata underlying the producer price index. Columns (1) and (2) consider a 30 minutes event window, (3) and (4) add firm fixed effects, (5) and (6) add firm and event fixed effects, (7) and (8) focus on a 60 minutes event window, and (9) and (10) look at daily event windows. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	Tight Window		Firm FE		Firm & Event FE		Wide Window		Daily Window	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
v_t^2	123.70***	73.18***	122.70***	72.99***			114.70***	89.34***	247.50**	162.00**
	(26.81)	(16.24)	(26.70)	(16.04)			(37.72)	(23.49)	(123.00)	(67.27)
$FPB \times v_t^2$	−121.90*	−41.10***	−119.90**	−41.32***	−117.60*	−16.88*	−86.00	−44.80**	−314.00	−104.90
	(61.75)	(6.98)	(59.54)	(6.95)	(61.64)	(9.81)	(65.28)	(20.13)	(230.50)	(106.00)
FPB	0.84**	0.48***					0.98*	0.62**	1.21	−0.49
	(0.32)	(0.17)					(0.54)	(0.25)	(2.57)	(2.32)
Event Fixed Effects	No	No	No	No	Yes	Yes	No	No	No	No
Firm Fixed Effects	No	No	Yes	Yes	Yes	Yes	No	No	No	No
Correction for outliers	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.11	0.09					0.03	0.08	0.01	0.00
Observations	57,541	57,439	57,541	57,437	57,541	57,411	57,541	55,018	57,541	57,510

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 4: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (measure FPC)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in a 30 minutes window bracketing the FOMC press releases on the federal funds futures based measure of monetary policy surprises calculated according to equation (2) in the main body of the paper, v_t^2, the frequency of price adjustment, FPC, as well as their interactions. See specification (3) in the main body of the paper. FPC forms the union of FPA and FPB. Equally-weighted frequencies of price adjustments are calculated at the establishment level using the microdata underlying the producer price index. Columns (1) and (2) consider a 30 minutes event window, (3) and (4) add firm fixed effects, (5) and (6) add firm and event fixed effects, (7) and (8) focus on a 60 minutes event window, and (9) and (10) look at daily event windows. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	Tight Window		Firm FE		Firm & Event FE		Wide Window		Daily Window	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
v_t^2	123.60***	73.66***	122.50***	73.47***			114.60***	89.26***	247.20**	161.70**
	(26.79)	(16.17)	(26.68)	(15.98)			(37.68)	(23.50)	(122.70)	(67.06)
$FPC \times v_t^2$	−120.30*	−38.05***	−118.30**	−38.30***	−116.20*	−16.69*	−84.77	−44.10**	−310.20	−102.50
	(60.99)	(6.25)	(58.79)	(6.22)	(60.81)	(9.57)	(64.44)	(19.72)	(227.50)	(104.60)
FPC	0.83**	0.47***					0.98*	0.61**	1.22	−0.50
	(0.32)	(0.17)					(0.55)	(0.25)	(2.56)	(2.30)
Event Fixed Effects	No	No	No	No	Yes	Yes	No	No	No	No
Firm Fixed Effects	No	No	Yes	Yes	Yes	Yes	No	No	No	No
Correction for outliers	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.11	0.09					0.03	0.08	0.01	0.00
Observations	57,541	57,441	57,541	57,439	57,541	57,411	57,541	55,018	57,541	57,510

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 5: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (measure FPAW)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in a 30 minutes window bracketing the FOMC press releases on the federal funds futures based measure of monetary policy surprises calculated according to equation (2) in the main body of the paper, v_t^2, the frequency of price adjustment, FPAW, as well as their interactions. See specification (3) in the main body of the paper. FPAW treats missing values as interrupting price spells. Value of shipments weighted-frequencies of price adjustments are calculated at the establishment level using the microdata underlying the producer price index. Columns (1) and (2) consider a 30 minutes event window, (3) and (4) add firm fixed effects, (5) and (6) add firm and event fixed effects, (7) and (8) focus on a 60 minutes event window, and (9) and (10) look at daily event windows. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	Tight Window		Firm FE		Firm & Event FE		Wide Window		Daily Window	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
v_t^2	127.80***	79.07***	126.80***	78.62***			119.40***	96.35***	251.20**	164.90**
	(29.69)	(15.87)	(29.63)	(15.37)			(39.00)	(25.25)	(122.70)	(76.09)
$FPAW \times v_t^2$	−159.90*	−66.91***	−157.20*	−65.77***	−156.30*	−39.26***	−125.90	−84.83***	−356.40	−181.70
	(82.55)	(4.77)	(80.86)	(4.49)	(81.09)	(7.92)	(78.26)	(22.74)	(245.20)	(113.00)
$FPAW$	0.22	0.05					0.02	−0.08	−0.59	−2.77
	(0.30)	(0.14)					(0.32)	(0.13)	(2.38)	(1.97)
Event Fixed Effects	No	No	No	No	Yes	Yes	No	No	No	No
Firm Fixed Effects	No	No	Yes	Yes	Yes	Yes	No	No	No	No
Correction for outliers	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.12	0.11					0.03	0.09	0.01	0.00
Observations	56,409	56,314	56,409	56,316	56,409	56,295	56,409	53,899	56,409	56,379

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 6: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (measure FPBW)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in a 30 minutes window bracketing the FOMC press releases on the federal funds futures based measure of monetary policy surprises calculated according to equation (2) in the main body of the paper, v_t^2, the frequency of price adjustment, FPBW, as well as their interactions. See specification (3) in the main body of the paper. FPBW treats missing values as not interrupting price spells if the price is the same before and after periods of missing values. Value of shipments weighted-frequencies of price adjustments are calculated at the establishment level using the microdata underlying the producer price index. Columns (1) and (2) consider a 30 minutes event window, (3) and (4) add firm fixed effects, (5) and (6) add firm and event fixed effects, (7) and (8) focus on a 60 minutes event window, and (9) and (10) look at daily event windows. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	Tight Window		Firm FE		Firm & Event FE		Wide Window		Daily Window	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
v_t^2	123.40***	75.24***	122.30***	74.69***			114.60***	91.69***	254.30**	156.20**
	(27.21)	(16.14)	(27.09)	(15.64)			(37.75)	(24.33)	(126.90)	(73.32)
$FPBW \times v_t^2$	−116.10*	−37.32***	−113.50*	−35.15***	−111.40*	−17.90*	−83.53	−52.30**	−333.20	−119.80
	(65.12)	(5.86)	(63.32)	(5.84)	(64.96)	(10.19)	(65.96)	(21.15)	(241.30)	(97.19)
$FPBW$	0.67**	0.52***					0.42	0.58***	0.56	−0.97
	(0.28)	(0.19)					(0.28)	(0.22)	(2.19)	(1.91)
Event Fixed Effects	No	No	No	No	Yes	Yes	No	No	No	No
Firm Fixed Effects	No	No	Yes	Yes	Yes	Yes	No	No	No	No
Correction for outliers	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.12	0.11					0.03	0.04	0.01	0.00
Observations	56,409	56,314	56,409	56,313	56,409	56,284	56,409	53,896	56,409	56,378

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 7: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (measure FPCW)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in a 30 minutes window bracketing the FOMC press releases on the federal funds futures based measure of monetary policy surprises calculated according to equation (2) in the main body of the paper, v_t^2, the frequency of price adjustment, FPCW, as well as their interactions. See specification (3) in the main body of the paper. FPCW forms the union of FPAW and FPBW. Value of shipments-weighted frequencies of price adjustments are calculated at the establishment level using the microdata underlying the producer price index. Columns (1) and (2) consider a 30 minutes event window, (3) and (4) add firm fixed effects, (5) and (6) add firm and event fixed effects, (7) and (8) focus on a 60 minutes event window, and (9) and (10) look at daily event windows. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	Tight Window		Firm FE		Firm & Event FE		Wide Window		Daily Window	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
v_t^2	123.40***	75.08***	122.20***	74.52***			114.50***	91.59***	253.90**	155.00**
	(27.20)	(15.98)	(27.08)	(15.62)			(37.74)	(24.35)	(126.50)	(73.01)
$FPCW \times v_t^2$	−114.80*	−38.11***	−112.30*	−34.42***	−110.30*	−16.26*	−82.53	−51.28**	−328.70	−109.80
	(64.29)	(5.46)	(62.51)	(5.49)	(64.06)	(9.59)	(65.11)	(20.84)	(237.60)	(95.37)
$FPCW$	0.66**	0.52***					0.41	0.57***	0.57	−1.63
	(0.27)	(0.18)					(0.27)	(0.22)	(2.18)	(1.78)
Event Fixed Effects	No	No	No	No	Yes	Yes	No	No	No	No
Firm Fixed Effects	No	No	Yes	Yes	Yes	Yes	No	No	No	No
Correction for outliers	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.12	0.11					0.03	0.04	0.01	0.00
Observations	56,409	56,315	56,409	56,313	56,409	56,285	56,409	53,897	56,409	56,377

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 8: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (firm & industry level controls, FF adj returns)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in a 30 minutes window bracketing the FOMC press releases on the federal funds futures based measure of monetary policy surprises calculated according to equation (2) in the main body of the paper, v_t^2, the frequency of price adjustment, FPA, as well as their interactions. See specification (3) in the main body of the paper. Equally-weighted frequencies of price adjustments are calculated at the firm level using the microdata underlying the producer price index. pcm is the price cost margin defined as sales minus cost of goods sold over sales, $4F-conc\ ratio$ is the four-firm concentration ratio, bm is the book-to-market ratio and size is the logarithm of the market capitalization. std sale is the volatility of annual sales growth at the quarterly frequency, nondur, serv, invest, gov and nx follow the durable goods classification of Gomes et al. (2009), dura is the durability measure of Bils et al. (2012), labor share is the share of total staff expenses in sales, FWA is the frequency of wage adjustment of Barattieri et al. (2014), RecPay2Y is receivables minus payables to sales, I2Y is investment to sales and D2A is depreciation and amortization over total assets. engel are the Engel curve slopes of Bils et al. (2012), sync is the degree of synchronization in price adjustment at the firm level, #prod is the number of products in the producer price data, Rat is the S&P long-term issuer rating, KZ is the Kaplan-Zingales index, Lev is financial leverage, FC2Y is fixed costs to sales, and export is the fraction of foreign sales in total sales. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
v_t^2	25.86***	21.62***	29.41***	94.44***	42.10*	17.69***	26.61***	23.42***	23.27***	14.53*
	(4.65)	(2.94)	(3.95)	(34.11)	(25.08)	(3.13)	(8.47)	(3.38)	(6.93)	(7.97)
$FPA \times v_t^2$	−23.10***	−23.24***	−22.90***	−27.81***	−23.65***	−26.21***	−14.42**	−17.51***	0.21	−21.24***
	(4.48)	(5.41)	(4.64)	(3.59)	(4.14)	(3.54)	(5.63)	(3.67)	(7.21)	(2.91)
$v_t^2 \times pcm$		9.63								
		(6.96)								
$v_t^2 \times 4F-conc\ ratio$			−22.21***							
			(5.39)							
$v_t^2 \times bm$				4.50**						
				(2.25)						
$v_t^2 \times size$					−1.00					
					(1.49)					
$v_t^2 \times std\ sale$						130.50***				
						(21.52)				
$v_t^2 \times nondur$							−7.65			
							(5.97)			
$v_t^2 \times serv$							−7.19			
							(7.23)			
$v_t^2 \times invest$							−1.58			
							(3.78)			
$v_t^2 \times gov$							9.78***			
							(3.53)			
$v_t^2 \times nx$							1.26			
							(8.43)			
$v_t^2 \times dura$								1.70		
								(1.42)		
$v_t^2 \times labor\ share$									−22.98*	
									(11.63)	
$v_t^2 \times FWA$										40.76
										(31.41)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Correction for outlier	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	57,497	51,995	50,186	57,498	57,498	52,003	43,063	47,478	9,767	47,421

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

continued on next page

Table 8: **Continued from Previous Page**

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
v_t^2	25.26***	25.57***	25.03***	8.24**	27.22***	27.99***	47.20***	21.67***	30.08***	20.12***	23.45***	−18.19
	(4.88)	(4.00)	(3.22)	(3.42)	(5.62)	(5.29)	(12.77)	(3.17)	(5.45)	(3.49)	(3.71)	(53.55)
$FPA \times v_t^2$	−20.58***	−23.52***	−20.92***	−10.53***	−15.33	−18.21***	−19.46***	−19.44***	−20.30***	−18.02***	−13.24***	−40.63**
	(4.92)	(4.84)	(5.38)	(3.58)	(13.53)	(3.98)	(5.53)	(4.25)	(3.89)	(1.75)	(3.28)	(15.77)
$v_t^2 \times pcm$												−43.38***
												(13.95)
$v_t^2 \times 4F - conc\ ratio$												−18.38***
												(5.68)
$v_t^2 \times bm$												0.38
												(0.74)
$v_t^2 \times size$												−1.08
												(0.87)
$v_t^2 \times std\ sale_a$												57.35
												(44.37)
$v_t^2 \times nondur$												−0.64
												(8.68)
$v_t^2 \times serv$												−7.47
												(10.68)
$v_t^2 \times invest$												−1.15
												(5.66)
$v_t^2 \times gov$												1.54
												(6.43)
$v_t^2 \times nx$												11.84*
												(6.19)
$v_t^2 \times dura$												2.29*
												(1.32)
$v_t^2 \times labor\ share$												
$v_t^2 \times FWA$												463.60
												(299.70)
$v_t^2 \times RecPay2Y$	6.47***											11.45*
	(2.42)											(6.63)
$v_t^2 \times I2Y$		−1.88										−19.42
		(7.45)										(24.39)
$v_t^2 \times D2A$			4.83									50.30
			(67.28)									(104.20)
$v_t^2 \times engel$				16.59***								−3.78
				(2.79)								(4.29)
$v_t^2 \times sync$					−9.28							83.51**
					(17.98)							(33.69)
$v_t^2 \times \#prod$						−0.02						0.01
						(0.01)						(0.01)
$v_t^2 \times Rat$							−6.28**					−3.50***
							(2.63)					(0.59)
$v_t^2 \times KZ$								4.29				−0.30
								(2.63)				(0.70)
$v_t^2 \times Lev$									−11.66**			−0.80
									(4.53)			(8.89)
$v_t^2 \times FC2Y$										26.64*		49.62***
										(15.22)		(14.90)
$v_t^2 \times export$											0.06	−0.15***
											(0.04)	(0.05)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Correction for outlier	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	55,945	55,631	56,205	47,477	57,371	57,500	53,360	56,413	56,456	56,534	31,762	19,942

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 9: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (different thresholds for outliers)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in different event windows bracketing the FOMC press releases on the federal funds futures based measure of monetary policy shocks calculated according to equation (2)in the main body of the paper, v_t^2, the frequency of price adjustment, FPA, as well as their interactions. See specification (3) in the main body of the paper. Different thresholds for outliers are used. Equally-weighted frequencies of price adjustments are calculated at the firm level using the microdata underlying the producer price index. Columns (1) to (4) consider a 30 minutes event window, (5) to (8) add firm fixed effects, (9) to (12) add firm and event fixed effects The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses. The last row shows the threshold used to identify outliers. The baseline level of the threshold is 0.1. See text for further details.

	Tight Window				Firm FE				Firm & Event FE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
v_t^2	82.37***	76.95***	74.56***	82.65***	81.97***	76.59***	74.41***	82.52***				
	(15.57)	(15.95)	(14.77)	(13.71)	(15.44)	(15.82)	(14.63)	(13.51)				
$FPA \times v_t^2$	−60.94***	−67.26***	−70.01***	−88.10***	−60.34***	−69.05***	−69.00***	−89.50***	−47.03 * *	−41.33***	−86.20***	−58.25***
	(13.76)	(5.02)	(11.38)	(20.65)	(12.51)	(4.95)	(12.33)	(19.54)	(18.10)	(5.32)	(18.79)	(10.86)
FPA	−0.02	0.09	0.11	0.22								
	(0.14)	(0.16)	(0.16)	(0.18)								
R^2	0.10	0.12	0.10	0.10	0.16	0.15	0.17	0.15	0.26	0.26	0.29	0.31
Observations	57,474	57,441	57,212	56,848	57,473	57,440	57,202	56,844	57,476	57,420	56,859	57,154
Threshold for outliers	0.150	0.100	0.050	0.025	0.150	0.100	0.050	0.025	0.150	0.100	0.050	0.025

Table 10: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (excluding industries)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in a 30 minutes window bracketing the FOMC press releases on the federal funds futures based measure of monetary policy surprises calculated according to equation (2)in the main body of the paper, v_t^2 and the interaction term with the frequency of price adjustment, FPA excluding one industry at a time. See specification (3)in the main body of the paper. Equally-weighted frequencies of price adjustments are calculated at the firm level using the microdata underlying the producer price index. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	All		excl. Agro	excl. Mnfg	excl. Util	excl. Trade	excl. Finance	excl. Service
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
v_t^2	127.50***	77.00***	76.28***	81.68***	76.06***	77.16***	74.61***	77.66***
	(29.45)	(15.78)	(14.72)	(19.25)	(15.55)	(15.51)	(15.09)	(16.40)
$FPA \times v_t^2$	−168.00**	−67.82***	−60.20***	−87.55***	−42.50***	−69.11***	−73.87***	−74.94***
	(80.35)	(4.47)	(3.87)	(13.61)	(3.62)	(5.98)	(6.39)	(5.82)
Correction for outliers	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	57,541	57,441	53,812	29,554	50,047	53,602	47,605	52,585

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 11: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (non-linear effects within industry)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in event windows bracketing the FOMC press releases on the federal funds futures based measure of monetary policy shocks calculated according to equation (2)in the main body of the paper, v_t^2, for the quintiles of the frequency of price adjustment distribution. See specification (3) in the main body of the paper. Columns (1) to (5) report quintiles for industry-adjusted frequencies. Columns (6)-(10) pool frequency quintiles across industries. See text for more details.

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
v_t^2	130.70***	107.00***	113.20***	99.71***	74.04***	136.00***	85.13***	107.30***	101.90***	69.18***
	(37.92)	(19.42)	(31.78)	(25.48)	(18.13)	(44.04)	(21.82)	(34.15)	(25.32)	(21.18)
R^2	0.08	0.11	0.19	0.15	0.11	0.11	0.05	0.19	0.17	0.10
Observations	9,438	12,050	11,429	12,553	12,071	9,192	10,204	10,830	11,273	11,173

Standard errors in parentheses

$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 12: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (IV and subsample)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in a 30 minutes window bracketing the FOMC press releases on the federal funds futures based measure of monetary policy shocks calculated according to equation (2) in the main body of the paper, v_t^2, the frequency of price adjustment, FPA, as well as their interactions for two subsamples of the data. See specification (3) in the main body of the paper. Equally-weighted frequencies of price adjustments are calculated at the firm level using the microdata underlying the producer price index. Columns (1) and (2) repeat the baseline results, (3) and (4) estimate the baseline specification for the first subsample, (5) and (6) estimate the baseline specification for the second subsample, (7) and (8) use the frequencies of price adjustment from the first subsample to instrument for the frequencies of the second subsample, and (9) and (10) use the frequencies of price adjustment from the second subsample to instrument for the frequencies of the first subsample. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	baseline		FPA from sample 1		FPA from sample 2		FPA from sample 1 IV: FPA from sample 2		FPA from sample 2 IV: FPA from sample 1	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
v_t^2	128.50***	76.95***	110.00***	72.20***	125.50***	74.75***	110.70***	113.80***	119.80***	104.30***
	(29.50)	(15.95)	(24.78)	(14.71)	(29.31)	(15.00)	(25.03)	(27.01)	(27.96)	(24.16)
$FPA \times v_t^2$	−169.80 **	−67.26***	−75.90*	−34.27***	−156.10*	−57.54 **	−99.87*	−107.10***	−125.80 **	−73.73 **
	(82.32)	(5.02)	(39.89)	(9.14)	(80.83)	(9.80)	(51.33)	(38.52)	(54.31)	(29.83)
FPA	0.41	0.09	0.33	0.14	0.32	0.12	0.44	0.23	0.27	0.38
	(0.33)	(0.16)	(0.26)	(0.16)	(0.29)	(0.14)	(0.34)	(0.19)	(0.23)	(0.29)
Correction for outliers	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.12	0.12	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.11
Observations	57,541	57,441	52,962	52,882	56,322	56,226	52,939	52,239	52,939	52,239

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 13: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (cuts of distribution of NProd)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in different event windows bracketing the FOMC press releases on the federal funds futures based measure of monetary policy shocks calculated according to equation (2) in the main body of the paper, v_t^2, the frequency of price adjustment, FPA, as well as their interactions for different percentiles of the distribution of the number of products in the producer price index micro data per firm (NProd). See specification (3) in the main body of the paper. NProdx denotes the x^{th} percentile of the distribution. Equally-weighted frequencies of price adjustments are calculated at the firm level using the microdata underlying the producer price index. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	baseline		NProd < NProd50		NProd >= NProd50	
	(1)	(2)	(3)	(4)	(5)	(6)
v_t^2	128.50***	76.95***	165.40***	96.11***	86.75***	53.19***
	(29.50)	(15.95)	(45.42)	(13.26)	(25.95)	(15.87)
$FPA \times v_t^2$	−169.80**	−67.26***	−201.50	−71.03***	−78.06***	−30.52***
	(82.32)	(5.02)	(133.50)	(15.60)	(24.08)	(15.58)
FPA	0.41	0.09	1.17***	0.71***	−0.22	−0.36
	(0.33)	(0.16)	(0.56)	(0.25)	(0.25)	(0.24)
Correction for outlier	No	Yes	No	Yes	No	Yes
R^2	0.12	0.12	0.13	0.19	0.11	0.06
Observations	57,541	57,441	25,270	25,171	32,271	32,170

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 14: **Response of the Constituents of the S&P500 to Monetary Policy Shocks (non-linear effects of FPA)**

This table reports the results of regressing squared percentage returns of the constituents of the S&P500 in different event windows bracketing the FOMC press releases on the federal funds futures based measure of monetary policy shocks calculated according to equation (2) in the main body of the paper, v_t^2, the frequency of price adjustment, FPA, as well as their interactions for different parts of the distribution of frequency of price adjustment. See specification (3) in the main body of the paper. FPAxx denotes the xx^{th} percentile of the distribution. Equally-weighted frequencies of price adjustments are calculated at the firm level using the microdata underlying the producer price index. The full sample ranges from February 1994 through December 2009, excluding the release of September 17, 2001, for a total of 137 observations. Standard errors are clustered at the event level and reported in parentheses.

	FPA < FPA50		FPA >= FPA50		FPA > FPA5		FPA < FPA95		FPA5 <FPA < FPA95	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
v_t^2	161.00***	98.52***	115.30***	84.60***	108.60***	70.08***	132.80***	76.29***	110.70***	65.78***
	(53.46)	(14.15)	(25.29)	(17.17)	(26.24)	(15.71)	(30.99)	(15.92)	(27.38)	(15.79)
$FPA \times v_t^2$	−929.00	−524.00***	−117.20***	−93.39***	−93.77***	−28.05 **	−215.30 **	−81.74***	−113.70***	−30.67*
	(873.60)	(65.27)	(25.64)	(11.04)	(27.54)	(10.80)	(99.94)	(10.45)	(31.85)	(15.65)
FPA	−1.40	−1.78	0.29	0.00	0.27	0.00	0.37	0.09	0.15	−0.01
	(3.25)	(1.15)	(0.28)	(0.13)	(0.20)	(0.16)	(0.37)	(0.19)	(0.22)	(0.19)
Correction outlier	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.11	0.07	0.14	0.13	0.11	0.10	0.12	0.12	0.12	0.10
Observations	27,222	27,117	30,319	30,192	53,275	53,171	54,670	54,563	50,404	50,290

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 15: **Summary Statistics and Correlations for Firm Characteristics and Explanatory Variables**

This table reports descriptive statistics of various firm characteristics and explanatory variables in Panel A. as well as pairwise correlations in Panel B. FPA is the equally-weighed frequency of price adjustment treating missing values as interrupting price spells, pcm is the price-cost-margin defined as sales minus cost of goods sold over sales, conc ratio is the four-firm concentration ratio, bm is the book-to-market ratio and size is the logarithm of the market capitalization. std sale is the volatility of annual sales growth at the quarterly frequency, Dur follows the durable goods classification of Gomes et al. (2009), dura is the durability measure of Bils et al. (2012), FWA is the frequency of wage adjustment of Barattieri et al. (2014), RecPay2Y is receivables minus payables to sales, I2Y is investment to sales and D2A is depreciation and amortization over total assets. engel are the Engel curve slopes of Bils et al. (2012), sync is the degree of synchronization in price adjustment at the firm level, #prod is the number of products in the producer price data, Rat is the S&P long term issuer rating, KZ the Kaplan-Zingales index, Lev is financial leverage, FC2Y is fixed costs to sales, and export is fraction of foreign sales in total sales. The full sample ranges from February 1994 through December 2009.

	FPA	$beta$	pcm	$conc\ ratio$	bm	$size$	$sale_a$	Dur	$dura$	FWA	$Pay2Y$	$I2Y$	$D2A$	$engel$	$sync$	$\#prod$	Rat	KZ	Lev	$FC2Y$	$export$
Panel A. Descriptive Statistics																					
Mean	0.14	1.00	0.40	0.15	-14.53	15.62	0.07	3.39	0.80	0.16	0.05	0.09	0.04	0.97	0.14	110.59	2.58	1.12	0.40	0.23	16.31
Std	0.13	0.39	0.20	0.09	1.37	1.24	0.06	1.26	1.01	0.01	0.53	0.13	0.02	0.33	0.11	124.54	1.21	0.98	0.24	0.23	15.85
Nobs	760	956	917	839	957	957	917	681	793	768	927	913	926	793	773	778	934	939	939	939	434
10^{th}	0.01	0.60	0.15	0.06	-15.52	14.25	0.02	2.00	0.00	0.15	-0.08	0.01	0.00	0.49	0.04	15.29	0.00	-0.01	0.10	0.00	1.55
25^{th}	0.04	0.74	0.24	0.09	-15.04	15.03	0.03	2.00	0.00	0.15	0.01	0.03	0.03	0.80	0.06	28.17	2.30	0.64	0.23	0.06	5.54
50^{th}	0.10	0.93	0.37	0.14	-14.64	15.62	0.05	3.00	0.20	0.15	0.06	0.06	0.04	0.96	0.11	64.18	3.00	1.13	0.39	0.19	11.36
75^{th}	0.22	1.19	0.56	0.18	-14.20	16.31	0.08	4.00	1.63	0.17	0.12	0.10	0.05	1.18	0.21	146.51	3.40	1.73	0.57	0.32	22.04
90^{th}	0.33	1.51	0.70	0.26	-13.82	17.03	0.12	5.00	2.27	0.18	0.20	0.20	0.07	1.44	0.29	293.09	3.65	2.29	0.72	0.51	36.88
Panel B. Pairwise Correlations																					
FPA	1																				
$beta$	-0.13	1																			
pcm	-0.14	0.19	1																		
$conc\ ratio$	0.01	-0.08	-0.05	1																	
bm	0.1	-0.07	-0.19	0	1																
$size$	0.03	0.07	0.25	0.09	-0.34	1															
$sale_a$	0.02	0.31	0.14	-0.08	-0.04	0.03	1														
Dur	0.03	0.33	0.03	-0.22	-0.07	-0.04	0.13	1													
$dura$	-0.14	0.24	-0.13	0.07	-0.05	-0.21	-0.04	0.29	1												
FWA	0.27	-0.06	-0.05	-0.35	0.09	0.03	0.18	0.2	-0.47	1											
$Pay2Y$	-0.04	0.04	-0.07	0	0.04	0	0.04	0.04	0.03	-0.15	1										
$I2Y$	0.29	0	0.19	0.02	0.01	0.04	0.25	0.07	-0.17	0.37	-0.06	1									
$D2A$	0.19	-0.06	0.01	0.2	0	-0.12	-0.03	0.15	0.12	0.16	0.04	0.44	1								
$engel$	-0.26	0.33	0.18	-0.34	0.01	-0.04	0.1	0.25	0.08	-0.08	-0.01	-0.23	-0.3	1							
$sync$	0.83	-0.14	-0.13	0.03	0.12	0.01	0.02	0.02	-0.2	0.34	-0.07	0.4	0.22	-0.29	1						
$\#prod$	0.2	-0.27	-0.25	0.14	0.08	0.1	-0.11	-0.17	-0.08	0.05	0.03	0.08	0.07	-0.32	0.22	1					
Rat	0.11	-0.27	-0.15	0.06	0.04	0.33	-0.18	-0.26	-0.14	-0.1	-0.03	-0.06	-0.14	-0.14	0.11	0.15	1				
KZ	0.11	0.08	-0.03	-0.06	0.27	-0.03	0.15	0.01	-0.06	0.15	0	0.11	-0.17	0.08	0.13	0.04	0.16	1			
Lev	0.16	-0.18	-0.08	0.02	0.35	0.04	-0.07	-0.23	-0.24	0.07	-0.01	0.06	-0.17	-0.1	0.19	0.21	0.42	0.66	1		
$FC2Y$	-0.28	0.29	0.66	0.04	-0.25	0.06	0.26	0.05	0.14	-0.22	-0.09	0.07	0.13	0.15	-0.3	-0.26	-0.33	-0.12	-0.35	1	
$export$	-0.12	0.01	0.03	0.01	0.05	0	0.06	0	0.01	-0.1	0.05	-0.11	-0.03	0.06	-0.16	0.03	0.01	-0.01	-0.02	0.1	1

Table 16: **Monetary Policy Surprises**

This table reports the days of the FOMC press releases with exact time stamps as well as the actual changes in the Federal Funds Rate further decomposed into an expected and an unexpected part. The latter component is calculated as the scaled change of the current month federal funds future in a half-hour (tight) window and one-hour (wide) window bracketing the release time according to equation (2) in the main body of the paper.

		Unexpected Change (bps)		Expected Change (bps)		
Release Date	Release Time	Tight Window	Wide Window	Tight Window	Wide Window	Actual Change (bps)
04-Feb-94	11:05:00	16.30	15.20	8.70	9.80	25.00
22-Mar-94	14:20:00	0.00	0.00	25.00	25.00	25.00
18-Apr-94	10:06:00	15.00	15.00	10.00	10.00	25.00
17-May-94	14:26:00	11.10	11.10	38.90	38.90	50.00
06-Jul-94	14:18:00	−5.00	−3.70	5.00	3.70	0.00
16-Aug-94	13:18:00	12.40	14.50	37.60	35.50	50.00
27-Sep-94	14:18:00	−9.00	−9.00	9.00	9.00	0.00
15-Nov-94	14:20:00	12.00	12.00	63.00	63.00	75.00
20-Dec-94	14:17:00	−22.60	−22.60	22.60	22.60	0.00
01-Feb-95	14:15:00	6.20	6.20	43.80	43.80	50.00
28-Mar-95	14:15:00	−1.00	0.00	1.00	0.00	0.00
23-May-95	14:15:00	0.00	0.00	0.00	0.00	0.00
06-Jul-95	14:15:00	−11.20	−7.40	−13.80	−17.60	−25.00
22-Aug-95	14:15:00	3.40	3.40	−3.40	−3.40	0.00
26-Sep-95	14:15:00	3.00	4.00	−3.00	−4.00	0.00
15-Nov-95	14:15:00	4.00	5.00	−4.00	−5.00	0.00
19-Dec-95	14:15:00	−9.00	−10.30	−16.00	−14.70	−25.00
31-Jan-96	14:15:00	−3.00	−3.00	−22.00	−22.00	−25.00
26-Mar-96	11:39:00	1.00	1.00	−1.00	−1.00	0.00
21-May-96	14:15:00	0.00	0.00	0.00	0.00	0.00
03-Jul-96	14:15:00	−7.20	−6.60	7.20	6.60	0.00
20-Aug-96	14:15:00	−2.80	−2.80	2.80	2.80	0.00
24-Sep-96	14:15:00	−12.00	−12.00	12.00	12.00	0.00
13-Nov-96	14:15:00	−1.80	−1.80	1.80	1.80	0.00
17-Dec-96	14:15:00	1.10	0.00	−1.10	0.00	0.00
05-Feb-97	14:15:00	−3.70	−3.00	3.70	3.00	0.00
25-Mar-97	14:15:00	4.00	4.00	21.00	21.00	25.00
20-May-97	14:15:00	−9.90	−9.90	9.90	9.90	0.00
02-Jul-97	14:15:00	−2.10	−1.10	2.10	1.10	0.00
19-Aug-97	14:15:00	0.00	0.00	0.00	0.00	0.00
30-Sep-97	14:15:00	0.00	0.00	0.00	0.00	0.00
12-Nov-97	14:15:00	−4.20	−4.20	4.20	4.20	0.00

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Table 16: **Continued from Previous Page**

Release Date	Release Time	Unexpected Change (bps) Tight Window	Unexpected Change (bps) Wide Window	Expected Change (bps) Tight Window	Expected Change (bps) Wide Window	Actual Change (bps)
16-Dec-97	14:15:00	0.00	0.00	0.00	0.00	0.00
04-Feb-98	14:12:00	0.00	0.00	0.00	0.00	0.00
31-Mar-98	14:15:00	−1.00	−1.00	1.00	1.00	0.00
19-May-98	14:15:00	−2.60	−2.60	2.60	2.60	0.00
01-Jul-98	14:15:00	−0.50	−0.50	0.50	0.50	0.00
18-Aug-98	14:15:00	1.20	1.20	−1.20	−1.20	0.00
29-Sep-98	14:15:00	5.00	6.00	−30.00	−31.00	−25.00
15-Oct-98	15:15:00	−24.20	−24.20	−0.80	−0.80	−25.00
17-Nov-98	14:15:00	−6.90	−5.80	−18.10	−19.20	−25.00
22-Dec-98	14:15:00	0.00	−1.70	0.00	1.70	0.00
03-Feb-99	14:12:00	0.60	0.60	−0.60	−0.60	0.00
30-Mar-99	14:12:00	−1.00	0.00	1.00	0.00	0.00
18-May-99	14:11:00	−1.20	−1.20	1.20	1.20	0.00
30-Jun-99	14:15:00	−3.00	−4.00	28.00	29.00	25.00
24-Aug-99	14:15:00	3.50	3.00	21.50	22.00	25.00
05-Oct-99	14:12:00	−4.20	−4.20	4.20	4.20	0.00
16-Nov-99	14:15:00	7.50	9.60	17.50	15.40	25.00
21-Dec-99	14:15:00	1.60	1.60	−1.60	−1.60	0.00
02-Feb-00	14:15:00	−5.90	−5.90	30.90	30.90	25.00
21-Mar-00	14:15:00	−4.70	−4.70	29.70	29.70	25.00
16-May-00	14:15:00	4.10	3.10	45.90	46.90	50.00
28-Jun-00	14:15:00	−2.50	−2.00	2.50	2.00	0.00
22-Aug-00	14:15:00	−1.70	0.00	1.70	0.00	0.00
03-Oct-00	14:12:00	0.00	−0.60	0.00	0.60	0.00
15-Nov-00	14:12:00	−1.00	−1.00	1.00	1.00	0.00
19-Dec-00	14:15:00	6.50	6.50	−6.50	−6.50	0.00
03-Jan-01	13:13:00	−39.30	−36.50	−10.70	−13.50	−50.00
31-Jan-01	14:15:00	3.50	4.00	−53.50	−54.00	−50.00
20-Mar-01	14:15:00	7.10	5.60	−57.10	−55.60	−50.00
18-Apr-01	10:54:00	−43.80	−46.30	−6.20	−3.70	−50.00
15-May-01	14:15:00	−9.70	−7.80	−40.30	−42.20	−50.00
27-Jun-01	14:12:00	10.50	11.00	−35.50	−36.00	−25.00
21-Aug-01	14:15:00	1.60	1.60	−26.60	−26.60	−25.00
02-Oct-01	14:15:00	−3.70	−3.70	−46.30	−46.30	−50.00
06-Nov-01	14:20:00	−15.00	−15.00	−35.00	−35.00	−50.00
11-Dec-01	14:15:00	−0.80	0.00	−24.20	−25.00	−25.00

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Table 16: **Continued from Previous Page**

Release Date	Release Time	Unexpected Change (bps) Tight Window	Unexpected Change (bps) Wide Window	Expected Change (bps) Tight Window	Expected Change (bps) Wide Window	Actual Change (bps)
30-Jan-02	14:15:00	2.50	1.50	−2.50	−1.50	0.00
19-Mar-02	14:15:00	−2.60	−2.60	2.60	2.60	0.00
07-May-02	14:15:00	0.70	0.70	−0.70	−0.70	0.00
26-Jun-02	14:15:00	0.00	0.00	0.00	0.00	0.00
13-Aug-02	14:15:00	4.30	4.30	−4.30	−4.30	0.00
24-Sep-02	14:15:00	2.00	2.50	−2.00	−2.50	0.00
06-Nov-02	14:15:00	−20.00	−18.80	−30.00	−31.20	−50.00
10-Dec-02	14:15:00	0.00	0.00	0.00	0.00	0.00
29-Jan-03	14:15:00	1.00	0.50	−1.00	−0.50	0.00
18-Mar-03	14:15:00	2.40	3.60	−2.40	−3.60	0.00
06-May-03	14:15:00	3.70	3.70	−3.70	−3.70	0.00
25-Jun-03	14:15:00	13.50	12.50	−38.50	−37.50	−25.00
12-Aug-03	14:15:00	0.00	0.00	0.00	0.00	0.00
16-Sep-03	14:15:00	1.10	1.10	−1.10	−1.10	0.00
28-Oct-03	14:15:00	−0.50	−0.50	0.50	0.50	0.00
09-Dec-03	14:15:00	0.00	0.00	0.00	0.00	0.00
28-Jan-04	14:15:00	0.50	0.00	−0.50	0.00	0.00
16-Mar-04	14:15:00	0.00	0.00	0.00	0.00	0.00
04-May-04	14:15:00	−1.20	−1.20	1.20	1.20	0.00
30-Jun-04	14:15:00	−0.50	−1.50	25.50	26.50	25.00
10-Aug-04	14:15:00	0.70	1.50	24.30	23.50	25.00
21-Sep-04	14:15:00	0.00	0.00	25.00	25.00	25.00
10-Nov-04	14:15:00	−0.80	0.00	25.80	25.00	25.00
14-Dec-04	14:15:00	−0.90	0.00	25.90	25.00	25.00
02-Feb-05	14:17:00	−0.54	0.00	25.54	25.00	25.00
22-Mar-05	14:17:00	0.00	−0.50	25.00	25.50	25.00
03-May-05	14:16:00	0.00	−0.56	25.00	25.56	25.00
30-Jun-05	14:15:00	−0.50	0.00	25.50	25.00	25.00
09-Aug-05	14:17:00	−0.71	−0.71	25.71	25.71	25.00
20-Sep-05	14:17:00	3.00	4.50	22.00	20.50	25.00
01-Nov-05	14:18:00	−0.52	−0.52	25.52	25.52	25.00
13-Dec-05	14:13:00	0.00	0.00	25.00	25.00	25.00
31-Jan-06	14:14:00	0.50	0.50	24.50	24.50	25.00
28-Mar-06	14:17:00	0.50	0.50	24.50	24.50	25.00
10-May-06	14:17:00	0.00	−0.75	25.00	25.75	25.00
29-Jun-06	14:16:00	−1.00	−1.50	26.00	26.50	25.00

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Table 16: **Continued from Previous Page**

		Unexpected Change (bps)		Expected Change (bps)		
Release Date	Release Time	Tight Window	Wide Window	Tight Window	Wide Window	Actual Change (bps)
08-Aug-06	14:14:00	−4.77	−4.77	4.77	4.77	0.00
20-Sep-06	14:14:00	−1.50	−1.50	1.50	1.50	0.00
25-Oct-06	14:13:00	−0.50	−0.50	0.50	0.50	0.00
12-Dec-06	14:14:00	0.00	0.00	0.00	0.00	0.00
31-Jan-07	14:14:00	0.00	−0.50	0.00	0.50	0.00
21-Mar-07	14:15:00	1.67	0.00	−1.67	0.00	0.00
09-May-07	14:15:00	0.00	−0.71	0.00	0.71	0.00
28-Jun-07	14:14:00	0.00	0.00	0.00	0.00	0.00
07-Aug-07	14:14:00	0.65	1.30	−0.65	−1.30	0.00
10-Aug-07	09:15:00	1.50	3.00	−1.50	−3.00	0.00
17-Aug-07	08:15:00	4.62	15.00	−4.62	−15.00	0.00
18-Sep-07	14:15:00	−20.00	−21.25	−30.00	−28.75	−50.00
31-Oct-07	14:15:00	−2.00	−2.00	−23.00	−23.00	−25.00
11-Dec-07	14:16:00	3.16	3.16	−28.16	−28.16	−25.00
22-Jan-08	08:21:00	−46.67	−45.00	−28.33	−30.00	−75.00
30-Jan-08	14:14:00	−11.00	−11.00	−39.00	−39.00	−50.00
11-Mar-08	08:30:00	8.68	7.11	−8.68	−7.11	0.00
18-Mar-08	14:14:00	10.00	10.00	−85.00	−85.00	−75.00
30-Apr-08	14:15:00	−6.00	−6.50	−19.00	−18.50	−25.00
25-Jun-08	14:09:00	−1.50	−1.00	1.50	1.00	0.00
05-Aug-08	14:13:00	−0.60	−0.50	0.60	0.50	0.00
16-Sep-08	14:14:00	9.64	11.25	−9.64	−11.25	0.00
08-Oct-08	07:00:00	−12.95	−13.30	−37.05	−36.70	−50.00
29-Oct-08	14:17:00	−3.50	−3.50	−46.50	−46.50	−50.00
16-Dec-08	14:21:00	−16.07	−24.15	−83.93	−75.85	−100.00
28-Jan-09	14:15:00	0.50	0.00	−0.50	0.00	0.00
18-Mar-09	14:17:00	−0.63	−0.63	0.63	0.63	0.00
29-Apr-09	14:16:00	0.00	0.50	0.00	−0.50	0.00
24-Jun-09	14:18:00	0.00	0.00	0.00	0.00	0.00
12-Aug-09	14:16:00	0.00	0.00	0.00	0.00	0.00
23-Sep-09	14:16:00	−1.07	0.00	1.07	0.00	0.00
04-Nov-09	14:18:00	−0.58	−0.58	0.58	0.58	0.00
16-Dec-09	14:15:00	−1.61	−1.07	1.61	1.07	0.00