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Abstract: About two weeks prior to each FOMC meeting, the Federal Reserve releases a description of economic activity in a document called the Beige Book. The authors examine whether the descriptive content of the Beige Book affects asset prices. The results indicate that more positive Beige Book reports on economic growth are associated with increases in interest rates, particularly long-term rates, even after controlling for other macroeconomic data releases. Stronger Beige Book reports are positively associated with changes in equity prices during expansions but negatively during recessions.

JEL classification: E5, E44

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Does the Beige Book Move Financial Markets?

A number of studies indicate that macroeconomic data releases cause movement in a number of financial instruments, including interest rates, stocks prices, and exchange rates (e.g., Andersen et al., 2002; Flannery and Protopapadakis, 2002; and McQueen and Roley 1993). Financial markets also respond to changes in the federal funds rate target (e.g., Balduzzi, Bertola, and Foesi, 1997). However, little is known about how or even whether financial markets systematically respond to qualitative, or non-numerical, information, such as speeches by Federal Reserve officials and economic reports released by the Federal Reserve.

Casual empiricism on the part of the media leads them to frequently attribute changes in financial markets to releases of qualitative information by the Federal Reserve. One such qualitative release is the Beige Book, which is a description of economic activity compiled by the 12 regional Federal Reserve banks and released about two weeks before each meeting of the Federal Open Market Committee (FOMC). The media often reports that markets moved in response to the information contained in the Beige Book, with headlines such as "Russell 2000 Retreats After Release of Beige Book" and "Bond Prices are Lifted by the Fed's Beige Book."[1] This paper examines whether the Beige Book, a qualitative description of economic activity, indeed affects stock prices and interest rates.

There are several reasons why the release of the Beige Book might influence financial markets. First, several studies show that the Beige Book is a good indicator of economic activity. Balke and Petersen (2002) conclude the Beige Book is a significant predictor of both current and next quarter real gross domestic product (GDP), even above and beyond other contemporaneous indicators such as the Blue Chip Consensus Forecast and lags of the growth

[1] Bauman (1995) and Hurtado (1994), respectively.

rates of real GDP, industrial production, and employment.[2] Payne (2001) similarly finds that the Beige Book is well correlated with a variety of other economic indicators, including the percentage change in indexes of coincident and leading indicators, the unemployment rate, and capacity utilization. Related studies find that the district Beige Books are well correlated with indicators of regional economic activity (Balke and Yucel, 2000; Ginther and Zavodny, 2001).

The Beige Book may contain information not available in other macroeconomic data releases because of the long lags in the release of some data series. Unlike other data series, the timing of the information gathering and the release date are explicitly geared to the FOMC meetings that occur eight times each year. The Beige Book reports on economic activity between the FOMC meetings and may reflect information not yet available via other sources. Financial markets may view the Beige Book as a summary of information currently available to monetary policy makers from other sources as well. Comments from Federal Reserve officials indicate that they rely in part on the Beige Book for such reasons when making policy decisions. For example, FOMC chairman Alan Greenspan reportedly likes the anecdotal information contained in the Beige Book because it provides firsthand insights into the economy in advance of the FOMC meetings (McTague, 1991).

In addition, the Beige Book might affect financial markets if the report signals the likely direction of monetary policy. A strong Beige Book report might indicate that the FOMC is likely to tighten monetary policy at its next meeting while a weak Beige Book might suggest that the FOMC will ease. Because the research staffs who advise monetary policy makers have input

[2] Fettig, Rolnick, and Runkle (1999), in contrast, find that the Beige Book summaries do not have predictive value beyond that of private sector forecasts. Balke and Yucel (2000) attribute the conflicting results to differences in the timing of the other forecasts used by Balke and Petersen (2002) and by Fettig, Rolnick, and Runkle. Fettig, Rolnick, and Runkle used forecasts made later in the quarter than the Beige Books, whereas Balke and Petersen focused on forecasts released prior to or at the same time as the Beige Books. Footnote 1 in Balke and Yucel (2000) provides a more detailed discussion.

into the report, the Beige Book may reflect their perceptions and preferred course of policy. Payne (2001) finds that the Beige Book is a significant predictor of changes in the federal funds rate target, outperforming the output gap in a Taylor rule model.

Examining the effect of the Beige Book on financial markets allows us to evaluate whether qualitative information on economic activity has an effect on financial markets. Many researchers have investigated the impact of macroeconomic data releases on financial markets in part because the "news" is relatively easy to determine. Most macroeconomic data are released on a regular schedule and at a particular time of day. Researchers can examine the surprise component of such data releases by taking the difference between the announced value and a survey of expected values. In contrast, "headline news," such as speeches about the economy by Greenspan, happens at irregular intervals and may prove difficult to identify and quantify.[3] Previous studies suggest that the amount of financial news reported by the media is correlated with stock market returns and trading volume (e.g., Berry and Howe, 1994; Mitchell and Mulherin, 1994). However, such studies do not link the actual content of the news to outcomes.

This study examines whether the content of a qualitative news event, the Beige Book, is correlated with interest rates and stock prices. We first briefly describe the Beige Book and offer economic intuition for why the report might influence these financial instruments. We then explain the quantitative index of the Beige Book that we created in order to investigate whether the reports are associated with changes in several measures of interest rates and equity prices during the period mid-1983 to 2001. The results indicate that the qualitative information contained in the Beige Book does systematically affect financial markets. Stronger Beige Book

[3] Although the effect of some of Greenspan's statements about the economy on financial markets may be easy to quantify (such as when he mentioned "irrational exuberance" on December 5, 1996), few pronouncements are likely to be as clear cut; however, the Dow Jones Industrial Average fell less than 1 percent the day after the "irrational

reports on economic growth are associated with an increase in interest rates, especially long-term rates. The Beige Book is also correlated with changes in equity prices, with the direction of the effect changing across the business cycle; the Beige Book is associated with a decline in equity prices during recessions but a rise during expansions. Finally, the effect of the Beige Book appears to have strengthened as the Federal Reserve System increased the transparency of the monetary policy-making process during the 1990s.

Description of the Beige Book

The Beige Book is a survey of regional economic conditions publicly released about two weeks prior to each FOMC meeting since mid-1983.[4] Each of the 12 regional banks writes a summary of economic conditions in its district, and one bank (on a rotating basis) writes a summary of national economic conditions based on the 12 regional reports. The research staff at the Board of Governors does not write the regional reports or the national summary but does have input into the wording of the document, particularly the national summary.

Each Federal Reserve Bank uses its own information-gathering methods to compile its Beige Book report. Most districts use a variety of methods, including calling local businesses, conducting regular surveys, reading local newspapers, and having members of their Board of Directors report on current and expected future economic conditions. The regional banks tend to emphasize the sectors that are economically important in the various districts and recent major economic developments. The reports focus on economic conditions since the last FOMC

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exuberance" speech, and bond prices were little changed, suggesting that the effect of speeches is not always obvious.

[4] Before May 1983, the Beige Book was confidential within the Federal Reserve System and was called the Red Book. Our sample period begins in May 1983. We drop the report dated as released on September 16, 1984, from the sample since this during a weekend, making the actual release date suspect.

meeting, essentially the last four to six weeks. Although the reports sometimes include details about future expectations, the Beige Book primarily discusses contemporaneous conditions.

Quantifying the Beige Book

In order to examine the effect of Beige Book releases on financial markets, the qualitative reports need to be quantified. Because the Beige Book is anecdotal, the reports describe the pace of economic activity with such adjectives as strong, moderate, or weak. Following the method of Balke and Petersen (2002), we created a quantitative index of these qualitative descriptions. We read each Beige Book (without knowing the release date) released between July 1983 and December 2001 and scored the description of economic growth in the national summary on a scale from –2 to 2, with lower scores indicating weaker growth. A Beige Book describing modest growth typically was scored 0.5; a Beige Book describing strong growth received a score of 1 to 1.5; and a Beige Book that indicated that activity was contracting received a negative score. Although key adjectives were helpful in determining the Beige Book score, we did not solely rely upon them. Instead, we used our judgment in much the same way financial market participants would. This analysis uses the average of our two scores for the national summary during the period mid-1983 to 2001.[5]

Our Beige Book index is well correlated with the pace of economic activity. As Figure 1 indicates, the index tends to be high during times of strong GDP growth and negative during recessions (the shaded areas). The raw correlation between our Beige Book index and real current-quarter GDP growth is 0.672. To further investigate whether our index is well correlated

[5] We focus on the national summary instead of the individual districts reports because financial markets are more likely to react to the national summary. We use the average of our two scores in order to reduce measurement error. Using either of the author's scores yields results similar to those shown here.

with output growth, we regressed real GDP growth rates on the index using Balke and Petersen's (2002) methodology. Table 1 reports the results for our index and for Balke and Petersen's index. Our index is as well correlated with GDP growth through 1996 as is Balke and Petersen's index; including the 1997-2001 period slightly reduces the goodness of fit of our index.

The Beige Book index is also correlated with monetary policy tools. Figure 2 shows the Beige Book score associated with each FOMC meeting from mid-1983 to 2001 and the discount rate and federal funds rate target decided on at that meeting (the FOMC began publicly announcing its target for the federal funds rate in February 1994). The index generally tracks the federal funds rate target and the discount rate until 1991. During the early 1990s, there is no clear relationship between the index and the targets, which is not surprising since the Federal Reserve purposely maintained a relatively loose monetary policy after the recession until 1994 (Greenspan, 1994).

Why the Beige Book might affect markets

The Beige Book could affect financial markets through several channels. First, as discussed above, the Beige Book may reflect the future direction of monetary policy. If the Beige Book reveals new information about the likely future stance of the FOMC, higher Beige Book scores should be positively associated with changes in nominal interest rates and negatively associated with stock returns. The media suggests that this is the case, with reports such as: "When the latest issue of the Beige Book was released just over a week ago . . ., stock traders and other financial market participants decided the book's message was one of greater strength in the economy than they had been expecting. To the markets, that meant that the Fed

was not likely to seek lower interest rates any time soon, and the traders' actions sent long-term rates up and bond prices down" (Berry, 1988).

The Beige Book also might affect market perceptions about the rate of economic growth. Markets might interpret a strong Beige Book as conveying new information that real economic activity has strengthened. Stronger economic growth is typically positively associated both with stock prices because it signals higher future profits and with interest rates because the cost of funds is procyclical. However, as McQueen and Roley (1993) point out, market participants' interpretation of macroeconomic news may differ according to the phase of the business cycle. For example, market participants might view a weak Beige Book during a recession as new "bad news" about economic growth. However, a similarly weak Beige Book released during an expansion might be viewed as signaling "good news" that the FOMC will not tighten monetary policy.

The Beige Book might have more of an effect on short-term interest rates than on long-term rates. Short-term rates are primarily based on expectations about monetary policy in the near future. Because the Beige Book focuses on recent innovations to economic activity, short-term rates are more likely than long-term rates to be affected to the extent the market interprets the Beige Book as providing new information about the pace of economic growth in the short run. If the effect of the Beige Book operates via expectations about monetary policy, conventional wisdom suggests that the effect is also likely to be stronger for short-term interest rates than for long-term rates because moves in short-term rates tend to track changes in the federal funds rate more closely than do long-term rates.

However, several studies suggest that changes in monetary policy can have substantial effects on long-term rates. Campbell (1995) notes that the long-term rates have occasionally

moved more in response to monetary policy changes than have short-term rates. He speculates that long-term rates might be more responsive to Fed interest rate hikes when the term premium rises due to increased interest rate risk, bond market volatility, or increased uncertainty about Fed policy. Kuttner (2001) finds that unanticipated changes in the federal funds rate target are associated with slightly larger changes in intermediate-term rates than in the 3-month rate and also finds significant effects on long-term rates. This suggests that, if markets view the Beige Book as a signal of monetary policy, long-term rates might respond as much as or even more than short-term rates. Balduzzi, Elton, and Green (2001) find that longer-term rates respond more to several macroeconomic data series, such as CPI, GDP, and housing data, than do shorter-term rates.

As noted above, this study is related to the literature on the effect of macroeconomic data releases on financial markets. Previous studies have reached mixed conclusions about the influence of such data as inflation, industrial production, and unemployment on stock prices (e.g., Pearce and Roley, 1985; Hardouvelis, 1987; Cutler, Poterba and Summers, 1989; Flannery and Protopapadakis, 2002). There is more of a consensus that macroeconomic news releases move bond markets (Fleming and Remolona, 1999; Balduzzi, Elton, and Green, 2001). The estimated effects of some macroeconomic announcements on stock prices appear to vary across phases of the business cycle (McQueen and Roley, 1993; Li and Hu, 1998). Effects also appear to be asymmetric, with negative announcements having more impact on financial instruments than positive announcements (Andersen et al, 2002; Conrad, Cornell, and Landsman, 2001). The Beige Book may affect financial markets if it is viewed in the same vein as other macroeconomic news. Indeed, it may have a larger effect than some other data releases if the report is viewed as a signal of future monetary policy.

Data and Methods

This analysis focuses on Treasury constant maturity yields and on a broad index of stock prices. We focus on the 3-month and 1-year rates as measures of short-term interest rates and the 2-year, 5-year, and 10-year rates as measures of longer-term yields; we also note results for several other points in the term structure. As in Flannery and Protopapadakis (2002), our measure of stock prices is the daily (close-to-close) value-weighted return in the NYSE, AMEX, and NASDAQ markets, without dividends.[6] We examine daily changes in all of these measures.[7]

Table 2 reports descriptive statistics for our Beige Book index and the simple correlation between the index and the percentage change in interest rates and the equity index on the day the report was released. During the entire sample period, the index is positively correlated with changes in short- and long-term interest rates and equity prices. During expansionary periods, as classified by the National Bureau for Economic Research's business cycle dates, the Beige Book is positively correlated with changes in yields on Treasury bond with maturities of at least one year and with changes in equity prices; during recessions, the index is negatively correlated with changes in interest rates for bonds with maturities of less than 10 years and with changes in equity prices.

[6] The interest rate data are from the H.15 release from the Board of Governors. The equity price index is from the CRSP tapes.

[7] The analysis could also be performed intraday to check that any movements occur after the Beige Book is released. However, we do not know what time the pre-1990s Beige Books were released; the Beige Book is currently released at 10 a.m. Controlling for other major macroeconomic news releases reduces concerns about whether other news underlies the estimated relationships.

We use a simple random walk model to further examine the relationship between the Beige Book and financial instruments. The random walk model posits that changes in interest rates and in equity prices are unpredictable, or

$$\Delta P_t = \alpha + \beta BB_t + \delta BB\ Day_t + \gamma Day\ of\ Week_t + \varepsilon_t \quad (1)$$

We regress the daily percentage change in our measures of interest rates and the stock index, ΔP_t, on the Beige Book index, BB_t, and a constant. Because we use observations for all days the markets were open, not just days when the Beige Book was released, the regressions also include a dummy variable indicating whether a Beige Book was released that day, $BB\ Day_t$; the coefficient on this dummy variable captures the average change when a report is released, and the coefficient on the linear Beige Book variable measures the marginal effect of the Beige Book index. Ideally, we would estimate the effect of any unexpected information reported in the Beige Book instead of the total effect. We attempt to account for the expected and unexpected components by including two Beige Book variables in our specification. The coefficient on the $BB\ Day_t$ dummy variable captures the average (expected) effect of the Beige Book on financial markets on the day it was released while the BB_t linear variable captures the unexpected component. Our analysis focuses on the marginal effect of the Beige Book, BB_t, because we want to evaluate whether and how the unexpected aspects of the reports affect financial markets.

The regressions also include dummy variables controlling for the day of the week because previous research suggests that there are day of the week effects on asset returns (e.g., Gibbons and Hess, 1981). We estimate the regressions using ordinary least squares (OLS) and use the Huber-White method to correct the standard errors for heteroscedasticity. Our approach assumes that the full effect of the Beige Book—if any—on asset prices occurs the same day as it is released and that the Beige Book report is not anticipated by the market and already priced in.

We treat the Beige Book scores as exogenous in the regressions because the reports are written based on observed economic activity that has already occurred. Innovations in financial markets on the day of the report's release cannot affect the information content of the document, which is written several days before it is released.

Results

The results indicate that the Beige Book score is positively associated with changes in most measures of interest rates during the period mid-1983 through 2001. Interpreting the results in Table 3 as marginal effects, a Beige Book with a score of 1 (which indicates strong growth) is associated with a 0.47 percentage point rise in the yield on the 2-year government bond relative to a Beige Book with a score of 0 (neutral), for example. The estimated relationships become more statistically significant as maturity increases; the Beige Book index is not significantly associated with changes in the 3-month t-bill rate (column 1) or with changes in federal funds futures or in the effective federal funds rate (not shown), but is associated with changes in the 30-year rate at the 1-percent level (not shown). In contrast with the significance levels, the estimated coefficients are not monotonic with respect to maturity. The Beige Book index is not significantly associated with stock returns (column 6).

Our finding that the Beige Book variable is more significantly associated with changes in intermediate- and long-term rates than with changes in short-term rates is a bit puzzling. A simple version of the expectations hypothesis predicts that the Beige Book should have a larger impact, in both significance and magnitude, on short-term rates, particularly given that Payne (2001) finds a strong relationship between the Beige Book and the federal funds rate target.[8]

[8] In contrast to Payne, we do not find a significant relationship between our Beige Book index and the federal funds rate target (or the effective federal funds rate). The correlation between our index and Payne's index is 0.815.

However, short-term rates tend to be more variable than intermediate- and long-term rates (Kozicki and Tinsley, 2001), making it more difficult to pick up any effect of the Beige Book on short-term rates. In addition, our results are consistent with those in Balduzzi, Elton, and Green (2001), who tend to find larger effects of macroeconomic data releases on long-term rates than on short-term rates.

Another interpretation of our findings is that the Beige Book does not reveal any new information about the direction of monetary policy at the next FOMC meeting or two. However, the results are consistent with financial markets interpreting the Beige Book as indicating the direction of monetary policy in the longer run, with stronger Beige Books signaling future increases in short-term rates. Alternatively, markets may interpret a stronger Beige Book as signaling a future increase in inflationary pressures, which would also raise longer-term interest rates. Our findings are also consistent with Campbell's (1995) observation that modest increases in short-term rates as a result of tightening by the FOMC can provoke large responses in long-term yields if markets view stronger Beige Books as signaling upcoming tightening. The pattern of the estimates therefore does not clearly indicate whether bond markets interpret stronger Beige Books as a signal of tighter monetary policy in the future or stronger economic growth in the future.

The effects of the Beige Book may be asymmetric, with positive reports provoking a different response than negative reports. We therefore also estimated our basic random walk model with three dummy variables indicating whether the general tone of the Beige Book was positive, negative, or neutral. The results are shown in Table 4.

Payne composed his scores by rating the adjectives used in the Beige Book summaries, including the District summaries, whereas our measure is based on reading the entire national summary.

Bond yields react more to Beige Books that indicate that the economy is contracting than to expansionary Beige Books. The estimated coefficients for the positive and neutral indicator variables are not significantly related to any of the measures of changes in interest rates. The indicator variable for a negative report, however, is significantly negatively related to changes in interest rates for maturities of one year or longer. These findings are consistent with previous studies that indicate that negative news has larger effects on financial instruments than positive news. As in the linear results, stock returns are not significantly related to the Beige Book variables.

Business Cycle

Several previous studies indicate that the effect of macroeconomic data releases varies across the business cycle. To examine whether the effect of the Beige Book varies across the business cycle, we interact the linear Beige Book variable with variables indicating whether the economy was expanding or contracting, as measured by the NBER recession dates.[9]

The results suggest that the impact of the Beige Book on stock returns varies over the business cycle. As shown in Table 5, higher Beige Book scores are positively associated with stock returns during expansions but negatively so during recessions. This suggests that during downturns, the stock market is more concerned about a stronger Beige Book as signaling an end to interest rate cuts than as indicating an uptick in growth. During expansions, the stock market appears to take the opposite view, putting more weight on the Beige Book as a signal of economic growth than as an indicator of tighter monetary policy in the future.

[9] The regressions also include indicator variables for whether the economy is expanding or contracting, an indicator variable for whether a Beige Book was released, and day of the week fixed effects.

The positive relationship between the Beige Book index and intermediate- and long-term yields appears to be concentrated during expansionary periods. This result is consistent with the general observation that nominal interest rates are procyclical but does not help distinguish between the hypotheses that markets view the report as a signal of monetary policy or as a signal of economic growth. Either is consistent with a positive relationship between interest rates and the Beige Book during expansionary periods.

Monetary Policy Regimes

The effect of the Beige Book also may depend on the direction of monetary policy. Monetary policy is classified as tightening, easing, or constant depending on the direction in which the FOMC changed the federal funds rate target at the meeting after each Beige Book was released.[10] In results not shown here, there are no significant differences across monetary policy regimes in the relationship between the Beige Book index and changes in financial instruments. We also investigated whether the results are different during the Greenspan era than during the entire period mid-1983 through 2001. Results using only the period when Greenspan is chairman of the FOMC are similar to those shown in the tables.

The effect of the Beige Book may have changed as the FOMC has increased the information about monetary policy it makes publicly available. The FOMC began announcing changes to the federal funds rate target on February 4, 1994. Increased transparency by the FOMC might have reduced the value of the Beige Book as a signal of monetary policy, weakening the relationship between our index and changes in bond yields and stock returns. On

[10] Part of our failure to find that the effect of the Beige Book depends on the status of monetary policy may be because the FOMC ostensibly targeted borrowed reserves instead of the federal funds rate until late 1987. The data on the federal funds rate target are from the Federal Reserve Bank of New York, http://www.ny.frb.org/pihome/statistics/dlyrates/fedrate.html.

the contrary, Table 6 shows that the estimated coefficients of the Beige Book variable in the interest rate regressions increase in significance when we examine only the period February 5, 1994 through December 31, 2001.[11] In addition, the positive coefficient in the equity index regression becomes significant at the 1 percent level. This may indicate that financial markets have learned over time to view the Beige Book as a signal of future monetary policy moves. Alternatively, increased transparency may have encouraged participants in financial markets to read the Beige Book as well as the FOMC directives, and markets may view the Beige Book as a measure of economic growth.

Other Macroeconomic Data Releases

As discussed above, several previous studies have concluded that macroeconomic data releases, such as the unemployment rate and the GDP growth rate, affect interest rates and stock prices. Some of these releases occurred on the same day as the Beige Book was released, creating the possibility that the regressions are picking up the effect of other data series.[12] We therefore include in the regressions the difference between the actual data release and the median forecast for several major macroeconomic indicators: the unemployment rate, industrial production, CPI, and GDP (or GNP) growth rate.[13] The forecast data and the dates of the actual releases are from Money Market Services (MMS). We include only the unexpected component

[11] Chow tests indicate that the sets of coefficients for the pre- and post-transparency eras are significantly different only in the regression for the 3-month t-bill rate.
[12] Five industrial production numbers, seven CPIs, and five GDP growth rates were released on the same day as the Beige Book during our sample period of May 1983 through December 2001.
[13] Prior to 1990, the MMS tracked GNP instead of GDP. The regressions include all releases of GDP (GNP) growth rates. The results are similar of only the first release for each quarter is included and not the later revisions. The regressions also include indicator variables for release days of each data series and day of the week fixed effects.

of these data releases in the regressions because asset prices are likely to already reflect the expected component.[14]

Including other key data releases also suggests whether the Beige Book is viewed as a synopsis of information available in other releases or as an independent indicator of the state of the economy. If the estimated coefficient of the Beige Book index variable falls in magnitude and significance when the other indicators are included in the regressions, it suggests that the Beige Book does not contain information beyond what is available in other data series.

The results are little affected by including other major macroeconomic data releases. As Table 7 shows, the Beige Book index remains significantly positively associated with the change in intermediate- and long-term rates, and the magnitudes of the coefficients on the Beige Book variable are similar to those in Table 3. However, the Beige Book has less of an impact (as measured by statistical significance) on interest rates than other macroeconomic data releases. The qualitative nature of the Beige Book may reduce the signal-to-noise ratio as compared with the data releases. Unlike the Beige Book, the other data releases tend to cause movements in short-term interest rates, with a higher-than-expected unemployment rate reducing the yield on 3-month t-bills and stronger industrial production, inflation, and economic growth boosting the 3-month yield. There is no consistent pattern in the magnitude of the coefficients or significance levels as maturity increases. As in Table 3, we find that the Beige Book is not associated with changes in stock prices; only the unexpected component of the CPI is significantly associated with changes in the equity index. The results in Table 7 are also little affected by interacting all

[14] Although it would be desirable to examine the unexpected component of the Beige Book as well, there are no numerical estimates of market participants' expectations with regard to the Beige Book. There is no clear way to model quantitative expectations for a qualitative report.

of the measures of macroeconomic data releases, including the Beige Book, with indicators for whether the economy is in an expansion or a recession (results not shown).

Unlike the macroeconomic data releases discussed above, there is no published measure of market participants' expectations about the Beige Book. The effect of the Beige Book may depend on whether a report indicates stronger or weaker growth than expected. As noted above, we attempt to control for expectations about the Beige Book by including a dummy and a linear variable in the regressions. Another way to control for market expectations about the Beige Book is to use the difference between the current Beige Book score and the previous Beige Book score in the regressions instead of the linear Beige Book index variable. In results not shown here, the change in the Beige Book score is generally not significantly associated with changes in interest rates or in equity prices.

Conclusion

This study examines the relationship between changes in financial instruments and the qualitative report on economic activity released by the Federal Reserve System in advance of FOMC meetings. Our results suggest that markets respond to qualitative information released by the Federal Reserve System. We find that a quantitative index of the Beige Book is positively associated with changes in intermediate- and long-term interest rates on Treasury securities but is not significantly associated with changes in overnight and 3-month rates. This suggests that financial markets pay attention to the content of the Beige Book because it is a likely signal of future monetary policy, although not a signal of monetary policy in the very short run. Alternatively, markets may revise upward their expectations of future economic growth or inflation, both of which are associated with higher intermediate- and long-term rates, when a strong Beige Book is released. In addition, stronger Beige Book reports are positively associated

with stock returns during expansions but negatively so during recessions. This asymmetry suggests that stock markets focus on the Beige Book as an indicator of future monetary policy during downturns but as a gauge of economic growth during expansions. Finally, the effect of the Beige Book has, if anything, strengthened with increased transparency on the part of the Federal Reserve System.

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Table 1
Relationship between Beige Book Indexes and Real GDP Growth Rate

	Balke & Petersen 5/83-12/96 (1)	Our Index 5/83-12/96 (2)	Our Index 5/83-12/01 (3)
Beige Book index	3.992**	4.255**	3.750**
	(0.431)	(0.385)	(0.346)
Constant	0.887**	0.828**	0.987**
	(0.286)	(0.247)	(0.225)
Adj. R^2	0.456	0.502	0.451
N	108	108	149

Note: Shown are coefficients (standard errors) from OLS regressions with the current-quarter real GDP growth rate as the dependent variable. Standard errors are White-corrected for heteroscedasticity.
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

Table 2
Descriptive Statistics for Beige Book Index

	5/83-12/01	**Expansions**	**Recessions**
Mean	0.659	0.746	-0.333
Standard deviation	0.456	0.349	0.347
Number of observations	149	137	12
Correlation with:			
Treasury 3-month yield	0.117	-0.021	-0.317
Treasury 1-year yield	0.198	0.006	-0.380
Treasury 2-year yield	0.214	0.068	-0.070
Treasury 5-year yield	0.193	0.101	-0.032
Treasury 10-year yield	0.217	0.106	0.061
Value-weighted equity index	0.106	0.116	-0.525

Table 3
Relationship between Beige Book Index and Change in Financial Instruments

	3-month (1)	1-year (2)	2-year (3)	5-year (4)	10-year (5)	Equities (6)
Beige Book index	0.318	0.463†	0.468*	0.354*	0.381*	0.230
	(0.341)	(0.244)	(0.210)	(0.151)	(0.170)	(0.189)
Beige Book released	-0.220	-0.330	-0.335†	-0.254†	-0.302*	-0.101
	(0.308)	(0.221)	(0.188)	(0.133)	(0.138)	(0.127)
Monday	0.484**	0.279**	0.130*	0.074	0.051	-0.062
	(0.056)	(0.055)	(0.056)	(0.050)	(0.045)	(0.049)
Tuesday	-0.009	0.032	-0.061	-0.099†	-0.081†	-0.003
	(0.051)	(0.055)	(0.057)	(0.051)	(0.045)	(0.043)
Wednesday	-0.254**	-0.044	-0.047	-0.058	-0.033	0.012
	(0.050)	(0.055)	(0.057)	(0.051)	(0.045)	(0.041)
Thursday	-0.097†	0.067	-0.010	-0.037	-0.037	-0.013
	(0.050)	(0.058)	(0.059)	(0.053)	(0.046)	(0.043)
Constant	-0.046	-0.088*	-0.019	0.011	0.009	0.053
	(0.038)	(0.044)	(0.045)	(0.040)	(0.035)	(0.031)
Adj. R^2	0.046	0.010	0.004	0.004	0.003	0.001
N	4790	4790	4790	4790	4790	4717

Note: Shown are coefficients (standard errors) for regressions with the daily percentage change in the indicated variable as the dependent variable. Standard errors are White-corrected for heteroscedasticity.
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

Table 4
Relationship between Beige Book Index and Change in Financial Instruments, by Beige Book Direction

	3-month (1)	1-year (2)	2-year (3)	5-year (4)	10-year (5)	Equities (6)
Positive Beige Book	0.081	0.078	0.072	0.049	0.012	0.057
	(0.085)	(0.078)	(0.078)	(0.072)	(0.068)	(0.086)
Neutral Beige Book	-0.083	-0.126	-0.053	-0.078	-0.161	0.067
	(0.238)	(0.279)	(0.420)	(0.568)	(0.398)	(0.116)
Negative Beige Book	-1.132	-1.269†	-1.243*	-0.854**	-0.780*	-0.035
	(1.068)	(0.675)	(0.531)	(0.299)	(0.341)	(0.303)
Adj. R^2	0.048	0.012	0.006	0.005	0.004	0.001
N	4790	4790	4790	4790	4790	4717

Note: Shown are coefficients (standard errors) for regressions with the daily percentage change in the indicated variable as the dependent variable. Regressions also include four day of the week fixed effects. Standard errors are White-corrected for heteroscedasticity.
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

Table 5
Relationship between Beige Book Index and Change in Financial Instruments, by Business Cycle

	3-month (1)	1-year (2)	2-year (3)	5-year (4)	10-year (5)	Equities (6)
Beige Book index × Expansion	0.405 (0.393)	0.493 (0.323)	0.378† (0.221)	0.337† (0.191)	0.322† (0.170)	0.459* (0.218)
Beige Book index × Recession	-0.717 (0.562)	-0.060 (0.767)	0.812 (0.684)	0.500 (0.450)	0.763 (0.548)	-0.911† (0.488)
Expansion	-0.026 (0.038)	-0.075† (0.045)	-0.016 (0.045)	0.009 (0.040)	0.005 (0.035)	0.054† (0.031)
Recession	-0.300** (0.080)	-0.244** (0.097)	-0.057 (0.100)	0.035 (0.081)	0.047 (0.069)	0.038 (0.068)
Adj. R^2	0.050	0.013	0.005	0.004	0.004	0.004
N	4790	4790	4790	4790	4790	4717

Note: Shown are coefficients (standard errors) for regressions with the daily percentage change in the indicated variable as the dependent variable. Regressions also include an indicator variable for days when the Beige Book was released and four day of the week fixed effects. Standard errors are White-corrected for heteroscedasticity.
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

Table 6
Relationship between Beige Book Index and Change in Financial Instruments, 1994- 2001

	3-month (1)	1-year (2)	2-year (3)	5-year (4)	10-year (5)	Equities (6)
Beige Book index	1.146	1.123*	1.009*	0.742**	0.715*	0.637**
	(0.813)	(0.557)	(0.451)	(0.273)	(0.353)	(0.248)
Beige Book released	-1.017	-1.126*	-0.953*	-0.702*	-0.757*	-0.508
	(0.812)	(0.563)	(0.460)	(0.281)	(0.335)	(0.217)
Adj. R^2	0.094	0.018	0.007	0.006	0.007	0.003
Beige Book index × Expansion	1.181	1.274*	0.725†	0.666*	0.629**	0.684*
	(0.817)	(0.639)	(0.386)	(0.299)	(0.246)	(0.342)
Beige Book index × Recession	-0.576	-0.839	2.961	1.517	1.640	0.231
	(1.519)	(2.393)	(2.247)	(1.433)	(2.281)	(1.312)
Expansion	-0.003	-0.043	0.005	0.040	0.034	0.075
	(0.055)	(0.058)	(0.074)	(0.067)	(0.058)	(0.055)
Recession	-0.390**	-0.271	-0.027	0.098	0.112	0.060
	(0.132)	(0.166)	(0.177)	(0.140)	(0.116)	(0.105)
Adj. R^2	0.102	0.021	0.008	0.006	0.007	0.005
N	1970	1970	1970	1970	1970	1991

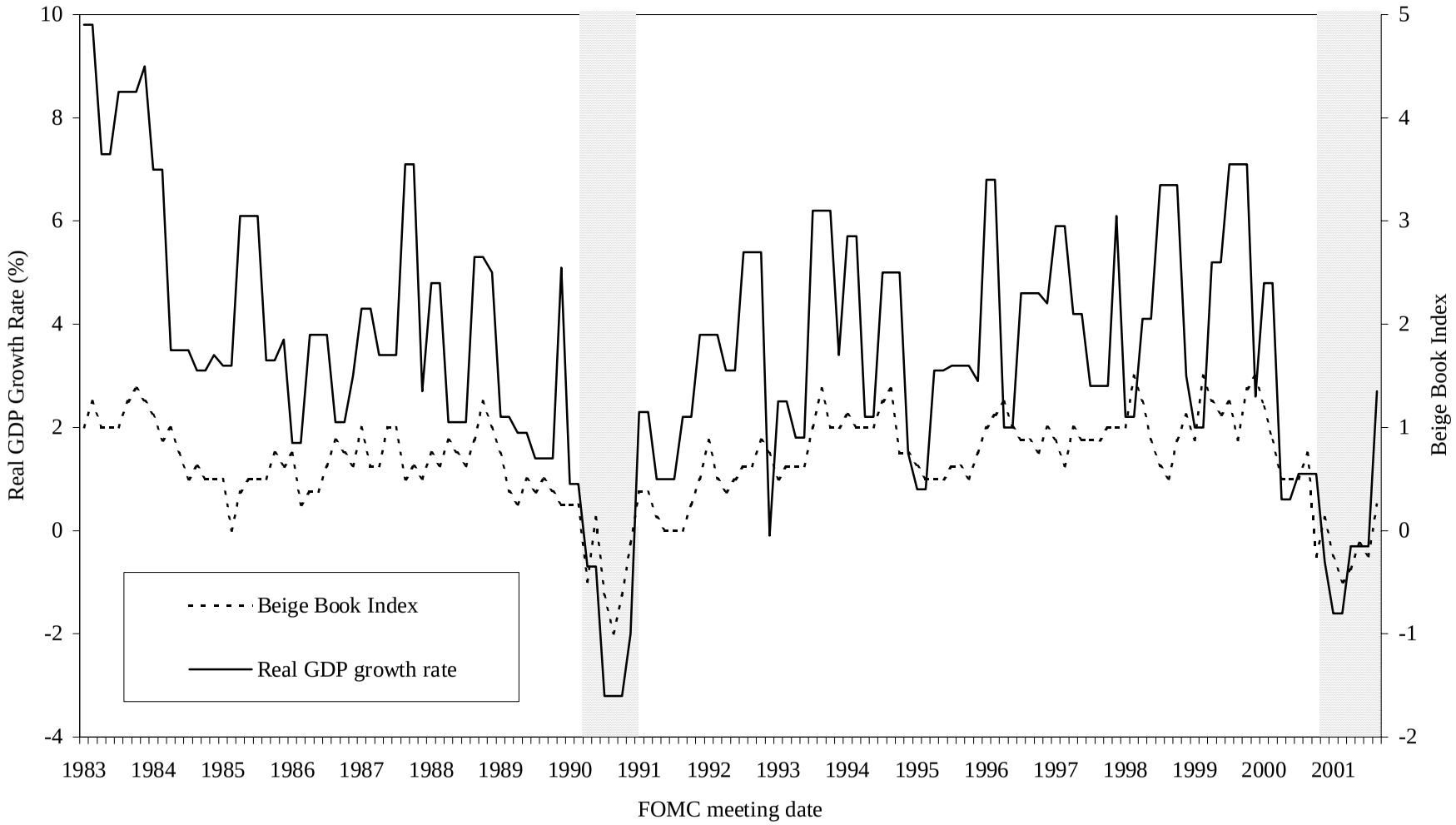
Note: The regressions include data for February 4, 1994, through December 31, 2001. Shown are coefficients (standard errors) for regressions with the daily percentage change in the indicated variable as the dependent variable. Regressions also include an indicator variable for days when the Beige Book was released and four day of the week fixed effects. Standard errors are White-corrected for heteroscedasticity.
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

Table 7
Relationship between Beige Book Index, Macroeconomic Data Releases, and Change in Financial Instruments

	3-month (1)	1-year (2)	2-year (3)	5-year (4)	10-year (5)	Equities (6)
Beige Book index	0.309	0.455†	0.460*	0.351*	0.380*	0.219
	(0.340)	(0.240)	(0.208)	(0.145)	(0.165)	(0.187)
Unemployment rate	-2.674**	-3.403**	-3.213**	-2.477**	-1.768**	0.444
	(0.758)	(0.787)	(0.670)	(0.611)	(0.524)	(0.424)
Industrial production	1.289**	1.211**	1.125**	1.022**	0.761**	0.102
	(0.461)	(0.390)	(0.360)	(0.305)	(0.260)	(0.219)
CPI	1.490*	2.236**	1.936**	1.848**	1.503*	-1.688*
	(0.623)	(0.674)	(0.707)	(0.674)	(0.621)	(0.679)
GDP	0.173†	0.317*	0.308*	0.203	0.135	-0.014
	(0.101)	(0.134)	(0.139)	(0.138)	(0.120)	(0.099)
Adj. R^2	0.059	0.031	0.022	0.019	0.014	0.004
N	4790	4790	4790	4790	4790	4717

Note: Shown are coefficients (standard errors) for regressions with the daily percentage change in the indicated variable as the dependent variable. The non-Beige Book data releases are the difference between the actual release and the median forecast, as reported by MMS. Regressions also include four day of the week fixed effects and dummy variables indicating release days of each of the series. Standard errors are White-corrected for heteroscedasticity.
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

Figure 1
Beige Book Index and GDP Growth



Note: Shaded areas indicate recessions.

Figure 2
Beige Book Index and Monetary Policy Decisions