How Well Does the Beige Book Reflect Economic Activity? Evaluating Qualitative Information Quantitatively

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How Well Does the Beige Book Reflect Economic Activity? Evaluating Qualitative Information Quantitatively

Eight times a year, approximately two weeks before every FOMC meeting, the Federal Reserve releases a description of economic conditions in the twelve Federal Reserve districts. Called the Beige Book, this description relies primarily on surveys and anecdotal evidence gathered by the twelve district banks. For this paper, we read and numerically scored past Beige Books in order to determine the extent to which the descriptions in these books accurately reflect current economic activity as measured by quarterly real GDP growth. We find that both in-sample and out-of-sample, the quantitative Beige Book indices do have significant predictive content for current and next quarter real GDP growth. Furthermore, the Beige Book has information about current quarter real GDP growth not present in other indicators such as the Blue Chip Consensus Forecast or time series models that use real-time data.

IN THE CONDUCT OF MONETARY POLICY, the Federal Reserve must make policy decisions in the presence of a great deal of uncertainty. Not only is there uncertainty about the direction of future economic activity, but there can even be substantial uncertainty about current economic conditions. Preliminary estimates of real GDP typically become available one month after the quarter has ended and are frequently revised months and even years later. Economic statistics such as industrial production or retail sales, while being more timely than quarterly

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real GDP estimates, only partially reflect aggregate economic activity. As a result, considerable attention has been given to forecasting both current and near-term economic activity (see, for example, Braun 1990; Trehan 1989 and 1992; Miller and Chin 1996). Unfortunately, as the recent study of Koenig and Dolmas (1997) points out, forecasts of current quarter real GDP growth can be quite inaccurate.

Because of the difficulty of ascertaining current economic conditions from quantitative data, the Federal Reserve considers not only quantitative but also qualitative information about current economic conditions in its policy deliberations. Indeed, the discussion at FOMC meetings often includes anecdotes relating to current economic conditions. Among the sources of qualitative information about current economic conditions available to the Federal Reserve is a summary of economic conditions in the twelve Federal Reserve districts, referred to as the Beige Book. The potential advantage of the Beige Book is that it provides policymakers with timely information about current economic activity across the twelve Federal Reserve districts.

Academic economists have generally been skeptical about the use of anecdotal evidence and for good reason.[1] By their very nature, the accuracy of anecdotal or narrative accounts is difficult to evaluate. Too often, one does not have a systematic historical record of anecdotal evidence to check against actual economic performance. In addition, even if a historical record of anecdotal accounts exists there is still the problem of how to quantify and evaluate these narrative accounts. It is difficult to gather information contained in the anecdotal accounts and to systematically learn from them.

In this paper, we attempt to quantify and then evaluate the information contained in the Beige Book. Because of its explicit focus on current economic conditions, the Beige Book can be readily compared with more quantitative measures of economic activity such as GDP or industrial production. To assess the accuracy of the Beige Book, we read each Beige Book and gave numerical scores for the discussion in the national and sectoral summaries as well as the description of economic activity in each of the twelve Federal Reserve districts.

We find that our quantified measures of the Beige Book track current real GDP growth quite well. Furthermore, the Beige Book has predictive content for current and next quarter real GDP growth above and beyond that of alternative indicators such as the Blue Chip forecast or time series models based on real-time data. This holds both in-sample and out-of-sample. In particular, the Beige Book seems to catch turning points sooner than most of the alternative indicators.[2]

1. Alan Blinder (1997) refers to the Fed's use of anecdotal evidence as the "ask your Uncle" method of gathering information about the economy.

2. Since writing earlier drafts of this paper, we became aware of two other studies of the information content in the Beige Book. Payne (1998), using a different methodology to quantify the twelve district summaries of the Beige Book, finds that the Beige Book indices are correlated with various measures of economic activity such as real GDP growth and industrial production. Fettig, Rolnick, and Runkle (1999) use a methodology similar to ours to quantify the Beige Book and, like us, find that the national Beige Book summary is correlated with real GDP growth. However, unlike our study, they argue that the Beige Book does not contain additional information not included in private-sector forecasts. As we discuss below, their finding may have more to do with the timing of the private-sector forecasts to which the Beige Book is compared than to the absence of additional information in the Beige Book.

The outline for the remainder of the paper is as follows. Section 1 contains a brief description of the Beige Book and how it is compiled by the district banks' research departments. In section 2, we describe how we assigned numerical values to the Beige Book descriptions and the precautions we took to avoid inadvertently influencing the outcome of our study. In section 3, we compare the Beige Book to actual real GDP growth while in section 4 we evaluate the Beige Book's ability to forecast real GDP content relative to alternative indicators of aggregate economic activity. Section 5 concludes.

1. DESCRIPTION OF THE BEIGE BOOK

The Beige Book contains a written description of economic activity in each of the twelve Federal Reserve districts. It is released eight times a year, roughly two weeks before each FOMC meeting. Each district report is three pages long and includes a paragraph summarizing economic activity within the district and a more detailed description of activity in particular sectors such as retailing, manufacturing, construction, and others. While only sporadically present in some of the older Beige Books, recent Beige Books have also contained descriptions of wage and price pressures in the districts. In addition to district reports, the Beige Book contains an introductory paragraph that summarizes national economic conditions and a three-to-five page summary of national conditions in sectors such as retailing, manufacturing, construction, real estate, agriculture, and natural resources as reported by the twelve Federal Reserve District Banks. Both the national overview and national sectoral summaries draw on the reports of twelve regional banks.

What are the inputs that go into creating the Beige Book? Each individual District Reserve Bank is responsible for gathering and reporting on economic conditions in its district and is relatively free to emphasize which aspects of economic activity it deems important. In addition, one bank (which is randomly rotated among the regional banks) is responsible for compiling the district write-ups and for writing the national summary. While some district reports may contain publicly available statistical information such as employment growth or retail sales within the district, the primary focus of the regional reports is an assessment of the anecdotal evidence gathered by each of the district banks. Surveys are conducted by each bank's research department (or in one case the public affairs department), with analysts and economists surveying a list of "contacts" within their district. These may include businesses, banks, industrial and trade associations, local governments, and even members of the Board of Directors of the district bank. Other information, including statistical releases or even local newspaper reports, are sometimes gathered and reported. All this information is filtered by analysts in the district banks and summarized in each district bank's Beige Book report. It is important to remember that in quantifying the Beige Book we cannot separate out the marginal contribution of each of the sources of information; we can only assess the overall information content of the Beige Book. Our sense is that the value added of the analysts is quite high in that

they decide on what information to gather, how to assess that information, and how to communicate that information in the Beige Book.

2. SCORING THE BEIGE BOOK

The Beige Book was first publicly released in July 1983; thus we read each Beige Book beginning with the July 1983 and ending with the January 1997 issue. We read and scored each Beige Book in terms of (i) the national summary of economic conditions, (ii) the national summary of sectoral economic activity and (iii) the district banks' reports on economic conditions within their districts. The national sectors graded were retail, manufacturing, finance or banking sector, construction, and natural resources (which typically reflects reports on agriculture, petroleum, lumber, etc.). National summaries on these sectors are available for nearly every Beige Book (although not all district banks report on these sectors in every Beige Book). When grading the report in terms of individual district economic activity, substantial weight was given to the summary paragraph of regional conditions, but we did read and factor in the description of sectors within each region in our evaluation of the regional economic conditions.

Calibrating the Beige Book Scores

In order to quantify and formally evaluate the information content of the Beige Book, one must be able to assign a numerical value to its description of economic conditions.[3] Before a numerical score could be assigned, we had to decide what to look for when reading the Beige Book. The Beige Book descriptions contain information about many dimensions of economic activity including the level and growth rate of output, employment, and prices. However, when scoring the Beige Book, we chose to read them primarily for the information they implied about the current-quarter output growth. Reading the Beige Book in terms of its information about output growth allows us to relate the Beige Book to more standard quantitative measures of economic activity such as real GDP growth. While we read the Beige Book in terms of current growth, there were instances in which the Beige Book discussion seems to refer to the change in economic growth. For example, a phrase like "economic growth slowed in the district since the last Beige Book" suggests that the focus is on the change in growth. Unfortunately, it took too much effort to evaluate each and every Beige Book description in terms of its information about both the rate of growth and the change in the rate of change.

As to the particular numeric values, we scored each category on a scale from -2 to 2. Converting a verbal description to numerical value is not always straightforward. We adopted the convention that if the Beige Book description appeared to sug-

3. Other studies that have attempted to quantify qualitative or subjective data include Havrilesky's studies of political influence on monetary policy (Havrilesky 1990, 1991) and more recently Hamermesh and Biddle's studies on beauty and earnings (Hamermesh and Biddle 1994 and Biddle and Hamermesh 1998).

gest "moderate" or "normal" economic growth then this would typically be scored a 0.5. A description implying "strong" economic activity might rate a score of 1.0 or 1.5. Key words could be helpful in our scoring but we did not rely on them exclusively. We read the entire description in each Beige Book category and then used our judgment (much as actual readers of the Beige Book would) when assigning a score.

Precautions Taken against Reading Too Much into the Beige Book

After agreeing to the basic format for scoring, the two authors read the Beige Book independently of each other. Thus, while both readers scored the various Beige Book categories according to roughly the same scale, the actual interpretations and, hence, the scores of individual Beige Books could (and did) differ between readers. It turns out that the correlation between the Beige Book scores of the two authors averaged about 0.75 and ranged from a high of .82 (for national retail sector) to low of .65 (for Tenth District description of economic activity). We took as our Beige Book score for each category the average of the two authors' scores.

We also took precautions against inadvertently using our knowledge of actual economic outcomes from coloring our scores of the Beige Book descriptions by reading the Beige Books "blind." First, in order to make it more difficult to determine which time period a particular Beige Book referred to, we removed all references to the calendar year in each and every Beige Book.[4] Furthermore, we randomly ordered the Beige Books so that the order in which they were read did not correspond to the actual sequence. Thus, when reading the Beige Book we did not know the actual time period to which the Beige Book referred. Once the Beige Books were read and graded, we reordered the Beige Book scores in their proper temporal sequence. Note that in some sense, by reading the Beige Book out of sequence we may understate its information content. References are sometimes made to previous Beige Books which makes scoring the discussion more difficult. Also, by reading the Beige Books out of sequence we risk reading it out of context. Knowing the period in which the Beige Book discussion occurs might enable the reader to draw a clearer inference from the Beige Book report.

Timing of the Quantified Beige Book Series

As mentioned above the Beige Book is compiled eight times a year and released roughly two weeks before the scheduled FOMC meeting. As a result, unlike real GDP or other traditionally used time series data, the time period to which the Beige Book refers does not correspond exactly to a particular quarter or month. Since June 1987, every Beige Book notes the closing date for which the information was gathered. This date is typically a week or more before the official release date. Because the reports are prepared over the course of the month before the release date, the actual information in the report reflects economic activity during the six to eight weeks before the release of the Beige Book. In addition, the irregular release of the Beige

4. Unfortunately, it was not practical to remove references to the month of the year or to references to particular events such as the Olympics or the Persian Gulf War that would allow one to infer what the calendar year was.

Book makes it more difficult to compare it with regularly published quantitative measures of economic activity. As a result, some care was taken in attributing which month a particular Beige Book pertained to. This was done so that we could compare the information content of the Beige Book with other more traditional indicators of economic activity such as GDP or Industrial Production.

Table A1 in the Appendix notes the release date as well as the closing date of the Beige Book and the month/quarter to which we attributed the Beige Book in our statistical analysis below. For example, a Beige Book was released in December 1996 (12/04/96) yet the closing date of that Beige Book survey was 11/23/96. In this case, we attributed that Beige Book as containing information for November 1996. The January 1997 Beige Book was released 1/22/97 with a closing date of 1/13/1997. Because the closing date was less than two weeks into the current month, we attributed this Beige Book to December 1996. For comparison, Table A1 also reports the release dates for comparably timed Blue Chip forecast, monthly industrial production, monthly employment growth, and quarterly real GDP estimates. As one can see, our dating of the Beige Book is fairly conservative as the release dates and, even more often, the closing dates of the survey typically occur before the release dates of the other series.

Summary Statistics of the Beige Books Scores

All together, we have eighteen quantitative measures from each beige book: one national summary, five national sectoral measures, and twelve Federal Reserve District measures. Because in this paper we are primarily interested in the ability of the Beige Book to track aggregate economic activity, we also aggregated the sectoral Beige Book scores into a single index by taking a simple average of the scores for retailing, manufacturing, finance, and construction.[5] Similarly, we constructed an index based on the simple average of the twelve district summaries. These simple indices allow for summary measures of the information provided by the sectoral and district summaries. In addition to these aggregate indices, we also consider the disaggregated sectoral and district measures in our analysis below.[6] Thus, we have a total of twenty Beige Book indices.

Figure 1 plots the three aggregate Beige Book indices: the national summary, the aggregated sectoral summaries, and the aggregated district summaries. As one can see from the figure these series are highly correlated. They show much the same cyclical pattern with the 1990–91 recession and the 1983–84 recovery showing up prominently in all three indices. The sample average and standard deviations of the

5. We did not include the score for natural resources in the average since a priori one might expect strong activity in sectors such as agriculture or oil and gas extraction which feature prominently in the Beige Book discussion on natural resources to be negatively correlated with overall economic activity.

6. We made no attempt to create indices weighted by sector or district size. Given that we were not sure what an individual Beige Book score reflects, it seemed sensible to look at the simple average as an aggregate measure of the information in the sectoral and district summaries. Even so, it's not clear that for the purposes of predicting current or next quarter real GDP using weights based on the size would be optimal. Because we also consider the disaggregated sectoral and district scores in our regression analyses below, one might consider those to be the "optimal" index given a criterion of minimizing squared regression errors.

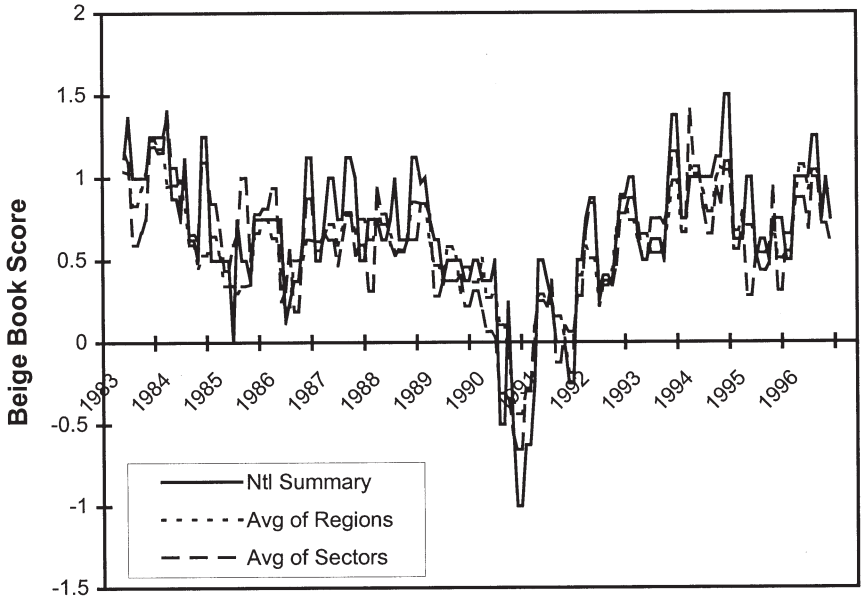

FIG. 1. Aggregate Beige Book Indices

various Beige Book measures are presented in Table 1. Most of the sample averages range between 0.50 and 0.65 which would typically be associated with a description of "moderate" or "normal" economic growth. The exception is the sample average of the natural resource sector's score which is well below the other sectors. The low score reflects the generally slow growth in the energy sector during the mid and late 1980s and the 1990s.

3. THE PREDICTIVE CONTENT OF THE BEIGE BOOK FOR REAL GDP GROWTH

While there are several dimensions in which the Beige Book can be evaluated, in this paper we evaluate the Beige Book in terms of its ability to predict current and next quarterly final real GDP. We use final real GDP (including revisions and re-benchmarking) rather than preliminary estimates of real GDP, as we consider final real GDP numbers to be a better measure of "true" aggregate activity. As a first look at how well the Beige Book tracks economic activity, Figure 2 plots real GDP growth and the average of the Beige Book sectoral scores. The figure suggests that the Beige Book index tracks real GDP pretty well. Not only does it capture the 1990–91 recession and the 1983–84 recovery, it even matches some of the ups and downs in quarterly real GDP growth.

Tables 2 through 6 present a more formal examination of the information content of the Beige Book. Table 2 presents regression results of current and next quarter real

TABLE 1

SAMPLE MEANS AND STANDARD DEVIATION FOR THE BEIGE BOOK INDICES

Aggregate Indices			Federal Reserve District Summaries		
	mean	std. dev.	District:	mean	std. dev.
Nation Summary	0.65	0.43	1. Boston	0.52	0.50
Avg. of District Summaries	0.59	0.33	2. New York	0.49	0.40
Avg. of Sectoral Summaries	0.59	0.38	3. Philadelphia	0.51	0.45
National Sectoral Indices			4. Cleveland	0.65	0.40
			5. Richmond	0.55	0.50
Retail	0.66	0.55	6. Atlanta	0.64	0.38
Manufacturing	0.63	0.54	7. Chicago	0.64	0.43
Banking and Finance	0.50	0.44	8. St. Louis	0.50	0.48
Construction	0.57	0.54	9. Minnesota	0.79	0.47
Natural Resources	0.27	0.70	10. Kansas City	0.63	0.36
			11. Dallas	0.49	0.51
			12. San Francisco	0.68	0.49

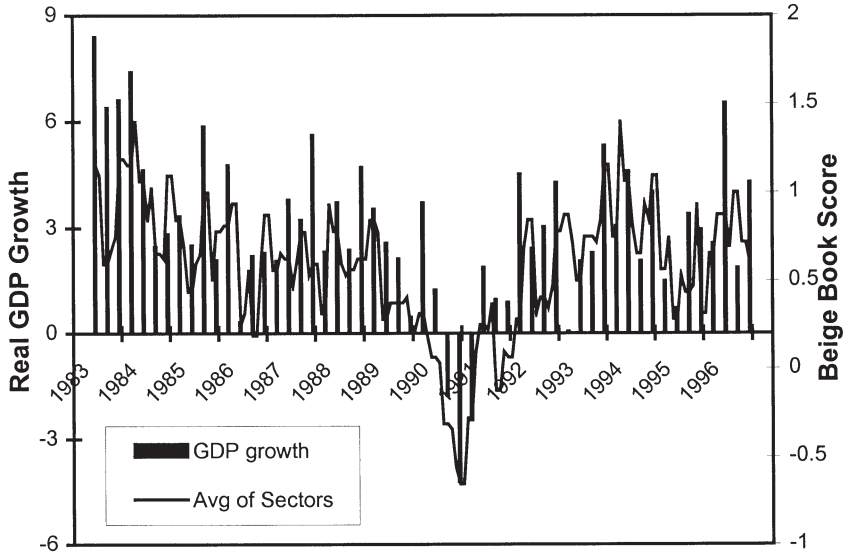

FIG. 2. Real GDP Growth and Beige Book Index

TABLE 2
PREDICTIVE CONTENT OF AGGREGATE BEIGE BOOK SUMMARIES

	Dependent variable: Current Quarter real GDP Growth				Next Quarter real GDP Growth			
Independent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
constant	0.70	0.00	0.34	−0.04	1.30**	1.04	1.12	1.05
	(0.52)	(0.64)	(0.45)	(0.49)	(0.64)	(0.75)	(0.70)	(0.68)
National Summary	3.28***	—	—	−0.74	2.29***	—	—	0.61
	(0.63)			(0.56)	(0.75)			(0.77)
Average of Regional Summaries	—	4.79***	—	2.77**	—	2.97***	—	0.10
		(0.90)		(1.29)		(1.11)		(1.58)
Average of National Sectoral Summaries	—	—	4.26***	2.95***	—	—	2.85***	2.20
			(0.67)	(1.13)			(0.96)	(1.60)
Sum of Coefficients	—	—	—	4.97***	—	—	—	2.91***
				(0.75)				(1.02)
see	1.77	1.64	1.59	1.55	2.01	2.01	1.96	1.97
adj-R^2	0.38	0.47	0.50	0.52	0.18	0.18	0.22	0.21
Ljung-Box Q (p-value)	0.45	0.00	0.15	0.01	0.00	0.00	0.00	0.00

NOTES: Heteroskedastic, autocorrelation consistent standard errors are in parentheses. Sample size = 109. *** = significant at 0.01 level, ** = significant at 0.05 level, * = significant at 0.10 level. Average of National Sectoral Summaries is the average of the Retail, Manufacturing, Construction, and Finance/Banking sector scores.

GDP growth against our three aggregate Beige Book measures.[7] Without exception, each Beige Book aggregate has significant explanatory power for current real GDP growth.[8] This is quite remarkable given that final real GDP numbers are not available until several months have passed and are often revised years after the fact. Both the average of regional summaries and the average of sectoral summaries regressions have adjusted R-squares near or above 50 percent. Furthermore, the regional and sectoral Beige Book descriptions have information above and beyond that contained in the national summary. Even though the Beige Book is not meant to be forward looking, it also has predictive content for next quarter real GDP. Again, individually, all three aggregates are statistically significant, although the adjusted R-squares are about half the size as those for the current quarter GDP regressions. Thus, the Beige Book aggregate indices clearly have predictive content for near term real GDP growth.

Table 3 displays the results when the individual Federal Reserve District scores are included in the GDP regression. Perhaps because the district reports are highly collinear, of the twelve districts only the Atlanta and Philadelphia district summaries are significant at the 5 percent level. Nonetheless, the sum of the coefficients of the regional summaries is statistically significant and is of a similar magnitude as the regional index presented in Table 2. Furthermore, the exclusion F-test implies that we

7. Because our focus is on the information content of the Beige Book and because of the irregular dating of the Beige Book releases, the unit of observation is the Beige Book release as discussed in the previous section. That is, for each year there will be eight observations that relate Beige Book to aggregate economic activity.

8. The standard errors, based on Newey and West (1987), are heteroskedastic, autocorrelation consistent covariance matrices with four lags.

TABLE 3

PREDICTIVE CONTENT OF DISAGGREGATED REGIONAL AND SECTORAL BEIGE BOOK SUMMARIES

Regression with individual regional summaries					Regression with individual sectoral summaries				
	current qtr GDP		next qtr GDP			current qtr GDP		next qtr GDP	
	coeff	(s.e.)	coeff	(s.e)		coeff	(s.e.)	coeff	(s.e.)
constant	0.34	(0.45)	1.30**	(0.65)	constant	0.44	(0.41)	1.22**	(0.59)
Boston	0.20	(0.48)	0.42	(0.56)	retail.	1.53***	(0.33)	0.58	(0.55)
N.Y.	−0.71	(0.81)	1.85***	(0.64)	manuf.	1.08***	(0.32)	0.51	(0.42)
Phil.	1.42***	(0.39)	0.18	(0.69)	bank/fin	0.30	(0.37)	−0.10	(0.38)
Cleveland	−0.10	(0.54)	0.27	(0.70)	construct..	1.15***	(0.36)	1.65**	(0.69)
Richmond	0.97*	(0.52)	1.47**	(0.52)	nat. res.	−0.31	(0.23)	−0.03	(0.32)
Atlanta	1.82***	(0.59)	0.28	(0.64)					
Chicago	−0.23	(0.47)	−0.80	(0.54)					
St Louis	0.56	(0.43)	−1.25***	(0.40)					
Minn.	−0.56	(0.49)	0.29	(0.60)					
Kan.City	−0.10	(0.49)	−0.27	(0.68)					
Dallas	0.74	(0.52)	0.13	(0.46)					
San Fran.	0.58	(0.34)	0.18	(0.50)					
sum of Beige Book coefficients	4.59***	(0.62)	2.76***	(0.99)	sum of Beige Book coefficients	3.75***	(0.48)	2.61***	(0.59)
p-value for excluding Beige Book variables	0.000		0.000		*p*-value for excluding Beige Book variables	0.000		0.055	
SEE	1.48		1.82		SEE	1.57		1.94	
adj. R^2	0.57		0.33		adj. R^2	0.51		0.24	
p-value for L-B *Q* stat	0.10		0.01		*p*-value for L-B *Q* stat	0.33		0.08	

NOTES: Heteroskedastic, autocorrelation consistent standard errors are in parentheses. Sample size = 109. *** = significant at 0.01 level, ** = significant at 0.05 level, * = significant at 0.10 level.

can strongly reject the null hypotheses that the individual regional summaries have no explanatory power for current quarter real GDP; indeed, the adjusted *R*-square of 0.57 is higher than any of the regressions in Table 2. With respect to next quarter real GDP, again only a few of the regional summaries are significant at the 5 percent level (New York, Richmond, and St. Louis), but both the sum of the coefficients and the exclusion tests suggest that the disaggregated regional summaries have predictive power for next quarter real GDP. Note that these regression results do not necessarily reflect the accuracy of the individual district summaries with respect to economic activity within the district, only the degree to which the district summary, along with those of other districts, predicts real GDP growth.

Table 3 also presents results for the case where the individual sectoral summaries are included as explanatory variables. In the regression on current quarter real GDP, the retail, manufacturing, and construction sector summaries were significant at the 1 percent level. The sum of the coefficients of the five sectoral summaries was statistically significant, and the hypotheses that all five coefficients were equal to zero are strongly rejected. As in the previous cases, the predictive content of the Beige Book sectoral summaries is less for next quarter GDP than for current quarter GDP. Of the sectoral summaries, only the construction summary was statistically significant for next quarter GDP, although once again the five sectoral coefficients were jointly significant as was the sum of the coefficients. In summary, there is significant information about current aggregate economic conditions in the individual Beige Book descriptions of district economic activity and national sectoral activity.

To get a better sense of the information contained in the district reports, we examined a simple principal components decomposition of the twelve district summaries. These are presented in Table 4. The first two principal components explain nearly two-thirds of the sum of the variances of district scores (53 percent and 13 percent respectively). Of the first six principal components, only the first two principal components appear to have predictive content for both current quarter and next quarter real GDP growth. In Table 5, we display the implied coefficients on the individual district scores for each of the first two principal components. For the first principal component all the district scores have a positive coefficient and are roughly the same magnitude. This probably reflects a common national business cycle component among the twelve districts. It also suggests that our simple average of the district scores captures this component reasonably well. On the other hand, the second principal component reflects differences in economic activity across districts. For this component Dallas, Kansas City, and Minneapolis have relatively large negative coefficients while Richmond and Philadelphia have relatively large positive coefficients. This principal component may reflect the fact that energy extraction and agriculture are important sectors in the Dallas, Kansas City, and Minneapolis districts and that "good times" in these sectors, that is, high prices, tend to have negative consequences for other sectors of the economy.

Recall that the Beige Book is released roughly two weeks before the eight FOMC meetings held each year. Sometimes the Beige Book is released well before the current quarter is completed. This means that the Beige Book at times contains at best

TABLE 4

PRINCIPAL COMPONENTS DECOMPOSITION OF DISTRICT BEIGE BOOK SCORES

Contribution of Principal Components to the Sum of District Variances				Real GDP growth regressions Dependent variable:	
principal component	Contribution	Cumulative Contribution	independent variable	current quarter real GDP growth	next quarter real GDP growth
1	52.99	52.99	Constant	0.45	1.47
				(0.47)	(0.54)
2	13.12	66.12	1st principal component	1.38***	0.87***
				(0.19)	(0.24)
3	7.57	73.68	2nd principal component	0.96***	1.35***
				(0.31)	(0.43)
4	6.28	79.96	3rd principal component	−0.31	−0.10
				(0.40)	(0.53)
5–8	13.17	93.13	4th principal component	−0.45	−0.44
				(0.44)	(0.44)
9–12	6.87	100.00	adjusted R^2	0.54	0.30
			see	1.53	1.86
			p-value for L-B Q-stat	0.00	0.00

NOTES: Heteroskedastic, autocorrelation consistent standard errors are in parentheses. Sample size = 109. *** = significant at 0.01 level, ** = significant at 0.05 level, * = significant at 0.10 level.

TABLE 5

COEFFICIENTS ON DISTRICT SCORES THAT MAKE UP FIRST TWO PRINCIPAL COMPONENTS

District summary	1st Principal Component	2nd Principal Component
Boston	0.38	0.21
New York	0.26	0.23
Philadelphia	0.30	0.35
Cleveland	0.26	−0.18
Richmond	0.34	0.37
Atlanta	0.25	0.15
Chicago	0.26	−0.15
St Louis	0.31	−0.12
Minneapolis	0.31	−0.37
Kansas City	0.17	−0.40
Dallas	0.29	−0.49
San Francisco	0.28	0.13

only one or two months of information about the current quarter. Table 6 displays the extent to which the aggregate Beige Book indices' information content varies depending on how far into the quarter it was released. Not surprisingly, the later the Beige Book was released during the quarter the greater its information content. The greatest increase in Beige Book's information content about current quarter real GDP occurs between one and two months into the quarter. Of the various Beige Book indices, the average of the national sectoral summaries shows less sensitivity to when it was released. For predicting next quarter real GDP growth, how far into the current quarter the Beige Book is released is less important.

On the basis of Tables 2 through 6, it is fair to say that the Beige Book summaries capture much of the same underlying economic activity that is reflected by final real

TABLE 6

PREDICTIVE CONTENT OF BEIGE BOOK DEPENDING ON MONTH OF THE QUARTER

	Dependent variable: Current quarter real GDP growth			Dependent variable: Next quarter real GDP growth		
	Month into quarter: 1	2	3	1	2	3
Regression:						
constant	1.28*	0.33	0.79	0.98	1.17**	1.84**
	(0.73)	(0.41)	(0.65)	(0.78)	(0.51)	(0.68)
National summary	2.19**	3.81***	3.26***	2.48**	2.52***	1.84**
	(1.01)	(0.54)	(0.71)	(1.08)	(0.67)	(0.75)
adj. R^2	0.10	0.49	0.49	0.11	0.20	0.19
Regression:						
constant	0.38	−0.01	−0.18	0.39	1.29**	1.32*
	(0.74)	(0.44)	(0.62)	(0.83)	(0.59)	(0.76)
Avg of regions	3.81***	4.92***	5.44***	3.59***	2.60***	3.03***
	(1.11)	(0.67)	(0.87)	(1.26)	(0.89)	(1.06)
adj R^2	0.24	0.51	0.64	0.18	0.13	0.26
Regression:						
constant	0.31	0.41	0.31	0.51	1.18**	1.68**
	(0.57)	(0.42)	(0.53)	(0.69)	(0.52)	(0.68)
Avg of sectors	3.81***	4.36***	4.64***	3.30***	2.90***	2.44**
	(0.80)	(0.64)	(0.69)	(0.97)	(0.79)	(0.89)
adj R^2	0.40	0.46	0.67	0.24	0.19	0.24
Regression:						
constant	0.49	−0.03	−0.47	0.48	1.27**	1.22
	(0.65)	(0.44)	(0.51)	(0.83)	(0.56)	(0.80)
All 3 aggregates[a]	3.63***	4.86***	6.48***	3.39**	2.40***	3.40**
	(0.99)	(0.69)	(0.82)	(1.26)	(0.89)	(1.28)
Excl. F-test[b]	8.91***	19.79***	24.46***	3.67**	5.59***	2.83*
adj R^2	0.42	0.52	0.77	0.20	0.21	0.21
Sample size	34	53	22	34	53	22

NOTES: [a]Sum of coefficients on national summary, avg. of regional summaries, and avg. of sectoral summaries. [b]Test that coefficients of National Summary, average of regional summaries, and average of sectoral summaries equal to zero. *** = significant at 0.01 level, ** = significant at 0.05 level, * = significant at 0.10 level.

GDP growth. Furthermore, the detailed individual regional and sectoral summaries provide additional information useful in predicting current and next quarter real GDP growth that is not contained in the overall national summary. This suggests that one should read the detail in the Beige Book (as reflected by the sectoral and district summaries) and not just the overall national summary.

4. COMPARISON OF THE BEIGE BOOK WITH OTHER INDICATORS OF ECONOMIC ACTIVITY

While Tables 2 through 6 demonstrate that the Beige Book's depiction of current economic activity mirrors that of quarterly real GDP, one is also interested in how the Beige Book compares with other sources of information about current real GDP. In this section, we examine the information content in the Beige Book relative to that in other indicators of current economic conditions. Among the indicators we examine are the consensus Blue Chip forecasts for current and next quarter real GDP and time series on lagged real GDP, industrial production, employment growth, and real retail sales.[9] All of these series are "real-time" series. That is, they are the numbers available to analysts around the time the Beige Book was released and not final, revised values that are typically available on electronic databases. This data set was painstakingly gathered by Evan Koenig and Sheila Dolmas (Koenig and Dolmas 1997), and we greatly appreciate their making their data set available to us. We will, however, keep as the dependent variable in our regressions the final estimate of real GDP as we assume that this reflects the best estimate (ex post) of actual aggregate economic activity. We, also, took care that the timing of the different explanatory variables was comparable (see Table A1), so that the Beige Book was evaluated against time series available to analysts around the time of the original Beige Book release.

Table 7 compares the predictive content of the Beige Book for real GDP growth with that of the consensus Blue Chip forecast. In this comparison, we examined regressions of real GDP growth against the Blue Chip consensus forecast and six alternative Beige Book measures. The Beige Book measures considered were the following: the national summary score, the average of the twelve district scores, the average of sectoral scores, the twelve district scores disaggregated, the five sectoral scores disaggregated, and the case where all three aggregate indices—national summary, average of regional scores, and average of sectoral scores—were included.

From Table 7, we can see that in nearly every single regression, regardless of whether current or next quarter real GDP growth is the dependent variable, the Beige Book has predictive content for real GDP growth above and beyond the Blue Chip forecasts. This in some sense is quite surprising as the Blue Chip forecasts are explicitly a forecast of real GDP both current and next quarter while the Beige Book supposedly reflects only current economic activity. In fact, aside from the national summary score, adding the Blue Chip forecast to current quarter real GDP regressions that already include a Beige Book measure results in an increase in the

9. These series have be found by Trehan (1992) and by Koenig and Dolmas (1997) to be useful in predicting current quarter real GDP.

TABLE 7

PREDICTIVE CONTENT OF BEIGE BOOK MEASURES VERSUS BLUE CHIP FORECAST

	Dependent variable: Current quarter real GDP growth Beige Book measure:					
	National summary	Average of regions	Individual regions[a]	Average of sectors	Individual sectors[b]	All three aggregates[c]
constant	−0.14	−0.42	−0.06	−0.17	−0.12	−0.39
	(0.46)	(0.31)	(0.43)	(0.44)	(0.44)	(0.44)
Beige Book measure:	1.50***	2.72***	2.90***	2.58***	2.47***	3.26***
	(0.44)	(0.80)	(0.66)	(0.59)	(0.54)	(0.71)
Blue Chip Forecast	0.79***	0.65***	0.51***	0.59***	0.58***	0.54***
	(0.17)	(0.18)	(0.16)	(0.16)	(0.18)	(0.16)
see	1.55	1.50	1.41	1.48	1.49	1.47
adj. R^2	0.52	0.55	0.61	0.57	0.56	0.57
L-B Q stat p-value	0.09	0.01	0.26	0.03	0.10	0.01
	Dependent variable: Next quarter real GDP growth Beige Book measure:					
	National summary	Average of regions	Individual regions[a]	Average of sectors	Individual sectors[b]	All three aggregates[c]
constant	−0.02	−0.23	0.39	0.08	−0.55	−0.03
	(0.49)	(0.51)	(0.63)	(0.49)	(0.57)	(0.65)
Beige Book measure	1.41**	1.84**	2.06*	1.83*	1.64**	1.96*
	(0.65)	(0.94)	(1.16)	(1.07)	(0.85)	(1.05)
Blue Chip Forecast	0.69***	0.70***	0.45*	0.60***	0.92***	0.60***
	(0.20)	(0.20)	(0.24)	(0.24)	(0.28)	(0.24)
see	1.90	1.90	1.79	1.89	1.82	1.90
adj. R^2	0.27	0.27	0.35	0.28	0.33	0.27
L-B Q stat p-value	0.00	0.00	0.00	0.00	0.00	0.00

NOTES: Heteroskedastic, autocorrelation consistent standard errors are in parentheses. [a] Sum of the coefficients on the twelve individual regional summaries included in regression. [b] Sum of the coefficients on the five individual sectoral summaries included in regression. [c] Sum of the coefficients on National summary, average of regions, and average of sectors. *** = significant at the 0.01 level, ** = significant at the 0.05 level, and * = significant at the 0.10 level.

adjusted R-squared of up to only eight percentage points. For next quarter real GDP the forward-looking nature of the Blue Chip forecasts becomes more important; nonetheless, all the Beige Book measures are still statistically significant.[10,11]

How does the Beige Book compare with other real-time variables? Table 8 presents the p-values for excluding the alternative Beige Book measures and other real-time variables from a regression for current and next quarter real GDP. Among the

10. Note that these results do not necessarily imply that the Blue Chip forecasts are not efficient as the participants in the Blue Chip survey often would not have had access to the Beige Book information. Similarly, on most occasions the Beige Book summaries were compiled and written before the Blue Chip forecasts were released.

11. Fettig, Rolnick, and Runkle (1999) found that the Beige Book did not have predictive content above and beyond the ASA/NBER survey of professional forecasters. However, their finding may be due to the different timing of Beige Book and ASA/NBER surveys. The ASA/NBER forecasts are typically released at the end of the second month of the quarter and would reflect information through at least through the first six weeks of the quarter. Like Fettig, Rolnick, and Runkle, we found that Beige Books released one month into the quarter did not contain any additional predictive content above the ASA/NBER forecast. This should not be too surprising given that this Beige Book would have been available to the forecasters in the ASA/NBER survey. However, we also found that Beige Books that contained information about the second and third months of the quarter did have additional predictive content above and beyond the ASA/NBER forecast.

TABLE 8

PREDICTIVE CONTENT OF BEIGE BOOK VERSUS REAL-TIME VARIABLES
P-VALUES FOR EXCLUSION OF VARIABLES FROM REGRESSION

	Dependent variable: Current quarter real GDP growth Beige Book measure:					
	National summary	Average of regions	Individual regions	Average of sectors	Individual sectors	All three aggregates[c]
Regression w/						
Beige Book	0.000	0.000	0.000	0.000	0.000	0.000
lagged GDP	0.533	0.342	0.036	0.086	0.105	0.051
Regression w/						
Beige Book	0.200	0.005	0.000	0.000	0.012	0.000
lagged GDP	0.350	0.075	0.096	0.025	0.177	0.026
Industr. prod.	0.001	0.006	0.058	0.014	0.015	0.009
employment	0.034	0.082	0.483	0.212	0.284	0.168
real retail sales	0.000	0.001	0.003	0.000	0.000	0.000
	Dependent variable: Next quarter real GDP growth Beige Book measure:					
	National summary	Average of regions	Individual regions[a]	Average of sectors	Individual sectors[b]	All three aggregates[c]
Regression w/						
Beige Book	0.019	0.113	0.000	0.034	0.063	0.024
lagged GDP	0.121	0.332	0.036	0.152	0.046	0.135
Regression w/						
Beige Book	0.166	0.567	0.000	0.139	0.012	0.176
lagged GDP	0.279	0.325	0.065	0.310	0.101	0.193
Industr. prod.	0.378	0.340	0.817	0.420	0.191	0.401
employment	0.325	0.312	0.536	0.415	0.293	0.386
real retail sales	0.806	0.875	0.882	0.882	0.859	0.822

NOTES: *P*-values based on heteroskedastic, autocorrelation consistent covariance matrix. Real time variables include four lags of lagged real GDP growth, current and two lags of monthly growth rate in industrial production, employment growth, and the growth rate of real retail sales. [a] *P*-values for exclusion of the twelve individual regional summaries. [b] *P*-values for exclusion of five individual sectoral summaries included in regression. [c] *P*-values for exclusion of the National summary, the average of regions, and the average of sectors.

real-time variables examined are four lags of real GDP growth, current and two lags of monthly industrial production growth, employment growth, and real retail sales (deflated by the CPI).[12] For current and next-quarter real GDP growth, all the Beige Book measures retain their predictive content when compared with four lags of real GDP growth. Lags of real GDP are generally not significant at the 5 percent level. When we add monthly real-time industrial production, real retail sales, and employment growth to the current quarter real GDP regression, all the Beige Book measures with the exception of the national summary continue to be statistically significant. On the other hand, among the real-time variables only industrial production is consistently statistically significant at the 5 percent level. With respect to next quarter real GDP, the *p*-values for excluding the Beige Book measures are higher than in the current quarter regressions, with only the disaggregated regional summaries, the average of the sectoral summaries, and the disaggregated sectoral summaries being statistically significant at the 5 percent level. However, the *p*-values for the Beige

12. We also examined the case in which current and five lags of the monthly real-time variables were used and the results were essentially the same. Generally, lags three through five were insignificant and were not included in our analysis.

Book measures are generally lower than the other real-time variables. What these results suggest is that the Beige Book contains information about current and next quarter real GDP growth not completely reflected in commonly used real-time indicators of aggregate economic activity.

Out-of-Sample Performance

In terms of within-sample prediction of real GDP growth, the Beige Book does quite well compared to other real-time variables. However, the relatively nonparsimonious specifications of at least the disaggregated regional and sectoral Beige Book summaries, to say nothing of the time series models, make one worry about overfitting the data. As a result, in this section we present results from an out-of-sample forecasting experiment in which we calculate one-step-ahead forecasts starting in 1990, updating the forecasting equation each period.[13] The root-mean-squared errors (RMSE) and the mean absolute errors (MAE) from these forecasts are presented in Table 9.[14]

TABLE 9

STATISTICS FOR ONE-STEP-AHEAD FORECAST ERRORS OF CURRENT QUARTER REAL GDP GROWTH

	Forecast period Jan 1990–Dec 1996		Forecast period Jan 1990–June 1993		Forecast period July 1993–Dec 1996	
forecast with:	RMSE	MAE	RMSE	MAE	RMSE	MAE
BB-Ntl Summary	1.90	1.45	2.18	1.67	1.59	1.25
BB-avg of regions	1.79	1.43	1.95	1.60	1.61	1.27
BB-individual regions	1.67	1.26	1.73	1.30	1.62	1.22
BB-avg of sectors	1.65	1.39	1.83	1.50	1.46	1.27
BB-individual sectors	1.66	1.39	1.88	1.57	1.42	1.22
BB-all three aggregates	1.65	1.40	1.76	1.49	1.53	1.32
Blue Chip	1.73	1.42	1.97	1.66	1.47	1.20
lagged GDP growth (4 lags)	2.37	1.78	2.76	2.06	1.84	1.50
lagged GDP plus	1.93	1.56	2.38	1.97	1.49	1.19

STATISTICS FOR ONE-STEP-AHEAD FORECAST ERROR FOR NEXT QUARTER REAL GDP GROWTH

	Forecast period Jan 1990–Dec 1996		Forecast period Jan 1990–June 1993		Forecast period July 1993–Dec 1996	
forecast with:	RMSE	MAE	RMSE	MAE	RMSE	MAE
BB-Ntl Summary	2.40	1.86	2.86	2.24	1.86	1.50
BB-avg of regions	2.44	1.82	2.94	2.21	1.84	1.45
BB-individual regions	2.32	1.86	2.59	2.07	2.02	1.66
BB-avg of sectors	2.39	1.84	2.64	2.08	1.89	1.61
BB-individual sectors	2.34	1.92	2.67	2.16	1.97	1.70
BB-all three aggregates	2.42	1.90	2.85	2.19	1.91	1.61
Blue Chip	2.19	1.66	2.55	1.98	1.79	1.36
lagged GDP growth (4 lags)	2.53	1.98	2.98	2.40	1.84	1.47
lagged GDP plus	2.57	2.04	2.91	2.29	2.06	1.77

NOTES: BB refers to Beige Book. "Lagged GDP plus" refers to four lags of real-time GDP plus current and two lags each of real-time monthly industrial production, employment and retail sales growth.

13. Following Koenig and Dolmas (1997), for the monthly real-time models we actually used a monthly forecasting model that has a different forecasting equation for each month of the quarter.

14. This is not a true real-time, forecasting experiment, as the dependent variable is still real GDP growth after revisions. Our primary interest is in trying to evaluate the Beige Book as measuring economic activity rather than as forecaster of real GDP growth per se.

When considering the entire out-of-sample period, projections for current quarter real GDP based on the Beige Book indices do quite well. Four of the six forecasts based on the Beige Book have lower RMSE and MAE than the Blue Chip forecast and all six have lower RMSE and MAE than the projections derived from real-time, time series models (lagged GDP and lagged GDP plus).[15] It turns out, however, that the relatively good performance is not uniform over the out-of-sample period. When we split the out-of-sample period in half, we find that over the forecast period starting in January 1990 through the first half of 1993 five of the six Beige Book projections do better than the Blue Chip forecast and all six do better than either time series projections. On the other hand, over the period starting in July 1993 through the end of 1996 only two Beige Book forecasts do better than the Blue Chip or the best real-time time series model (lagged GDP plus) in terms of RMSE and none do better in terms of MAE.

Table 10 presents tests of forecast emcompassing over the two subperiods. Here we regress real GDP growth against a Beige Book forecast and the forecast of one of the competing models. Table 10 displays the marginal significance of each of the competing forecasts in the regression. For the current quarter GDP regression over the period January 1990 to June 1993, with the exception of the national summary and the average of regions indices, the Beige Book forecasts generally dominate those based on the Blue Chip and the time series models—none of the other forecasts are statistically significant while the Beige Book forecast is. Over the second half of the forecast period, the Beige Book forecasts in general do not dominate the Blue Chip forecast or the time series forecast that includes industrial production, real retail sales, and employment growth. For next quarter real GDP and regardless of the sample period, in most regressions neither the Beige Book forecast nor the competing forecast are statistically significant, suggesting no clear advantage of one forecasting model over the other. Thus, while the Beige Book has a clear advantage in the first half of the forecasting period this advantage does not continue over to the later period.

What accounts for the different performance across two subperiods? Figure 3 plots the forecast errors for the period 1990 through July 1993 from Beige Book forecast based on the average of sectoral scores, the Blue Chip forecast, and the time series forecast that includes lagged real-time GDP growth, current and lagged industrial production, employment, and real retail sales growth. From the figure, the Beige Book forecast reflected the onset and end of the recession earlier than either the Blue Chip or the time series models. This suggests that the Beige Book, and maybe anecdotal evidence in general, may be most useful at turning points in the business cycle—periods in which more traditional economic indicators have historically had difficulty (Diebold and Rudebusch 1989).

15. In the forecasting experiment, we used the actual Blue Chip consensus forecast, rather than a regression projection.

TABLE 10

FORECAST ENCOMPASSING: *P*-VALUES FOR EXCLUDING FORECAST

forecast:	National summary	Average of regions	Individual regions	Average of sectors	Individual sectors	All three aggregates[c]
			Current quarter real GDP growth			
			out-of-sample forecast: Jan 1990–June 1993			
Beige Book	0.388	0.116	0.012	0.041	0.053	0.025
Blue Chip	0.026	0.116	0.288	0.368	0.232	0.433
Beige Book	0.001	0.000	0.000	0.000	0.000	0.000
lag GDP	0.187	0.017	0.049	0.249	0.470	0.053
Beige Book	0.812	0.246	0.030	0.070	0.067	0.046
lag GDP plus	0.015	0.083	0.277	0.160	0.100	0.262
			out-of-sample forecast: July 1993–Dec 1996			
Beige Book	0.723	0.772	0.124	0.148	0.523	0.781
Blue Chip	0.004	0.010	0.004	0.031	0.081	0.026
Beige Book	0.063	0.011	0.026	0.009	0.004	0.006
lag GDP	0.128	0.052	0.194	0.138	0.170	0.081
Beige Book	0.951	0.408	0.412	0.213	0.103	0.225
lag GDP plus	0.025	0.044	0.060	0.086	0.142	0.073
			Next quarter real GDP growth			
			out-of-sample forecast: Jan 1990–June 1993			
Beige Book	0.621	0.278	0.369	0.762	0.421	0.734
Blue Chip	0.049	0.020	0.162	0.135	0.215	0.066
Beige Book	0.215	0.376	0.033	0.050	0.026	0.137
lag GDP	0.412	0.483	0.271	0.225	0.243	0.325
Beige Book	0.918	0.468	0.225	0.443	0.183	0.949
lag GDP plus	0.310	0.146	0.970	0.739	0.840	0.419
			out-of-sample forecast: July 1993–Dec 1996			
Beige Book	0.123	0.086	0.077	0.343	0.664	0.239
Blue Chip	0.455	0.356	0.520	0.551	0.431	0.620
Beige Book	0.151	0.121	0.026	0.325	0.594	0.226
lag GDP	0.989	0.737	0.117	0.695	0.490	0.768
Beige Book	0.164	0.131	0.014	0.394	0.777	0.261
lag GDP plus	0.976	0.750	0.074	0.803	0.533	0.982

NOTES: "Lagged GDP plus" refers to four lags of real-time GDP plus current and two lags each of real- time monthly industrial production, employment and retail sales growth.

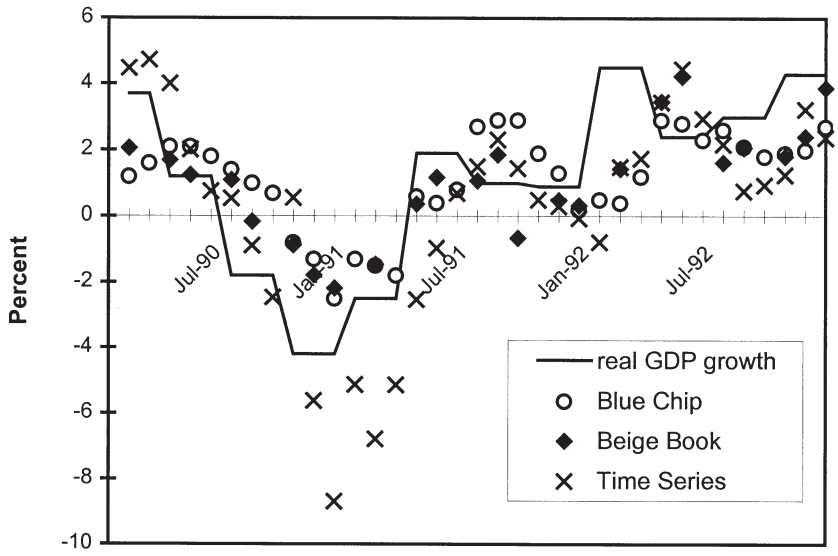

FIG. 3. Actual and Forecasted Real GDP Growth, 1990–1992

5. CONCLUSION

In this study, we attempted to quantify the qualitative information contained the Federal Reserve's Beige Book by assigning numerical scores to the descriptions of economic activity contained in the Beige Book document. We find that the quantified Beige Book descriptions do indeed reflect aggregate economic activity as measured by real GDP growth. Furthermore, Beige Book scores have information about economic activity above and beyond other variables such as the Blue Chip consensus forecast and other time series that would have been available to forecasters at the time. In particular, the Beige Book may be useful around turning points in the business cycle as these are notoriously hard to detect.

One should not infer from this study that we can dispense with traditional quantitative measures or formal forecasting models and rely on anecdotal evidence for assessing current economic activity—it was precisely because we quantified the Beige Book that we could begin to evaluate the information therein. However, in our judgment it would also be a mistake to infer that one could dispense with the verbal description in the Beige Book and rely solely on the quantified measures (either ours or others) of the Beige Book. As we mentioned above, much of the value added in the Beige Book may be the judgment of the analysts that write and compile the Beige Book rather than the raw information gathered in the Beige Book surveys. The act of giving a numerical value may restrict the degree to which this judgement can be communicated. Furthermore, the information in the Beige Book is multifaceted. We quantified and evaluated only one dimension of the Beige Book—in terms of what it was telling us about current economic activity as measured by output growth. But

one could just as easily read the Beige Book in terms of its description about inflation, financial market or credit conditions. This multifaceted information may be better communicated verbally rather than by a single numerical index. That said, by quantifying the Beige Book we have shown that in terms of providing information about current economic activity the Beige Book warrants serious reading.

APPENDIX TABLE A1: DATING THE BEIGE BOOK SERIES

Year, quarter of real GDP	Month attributed to independent variables	Beige Book release date	Beige Book closing date[a]	Release month of Blue Chip, employment, industrial production and retail sales[b]	Release date of BEA estimates of GDP.
1983-II	6	7/1/83		7/83	7/21/83
1983-III	7	8/10/83		8/83	8/19/83
1983-III	8	9/20/83		9/83	9/21/83
1983-IV	10	11/2/83		11/83	11/22/83
1983-IV	11	12/6/83		12/83	12/21/83
1983-IV	12	1/20/84		1/84	1/20/84
1984-I	2	3/13/84		3/84	3/20/84
1984-II	4	5/8/84		5/84	5/18/84
1984-II	5	6/25/84		6/84	6/20/84
1984-III	7	8/6/84		8/84	8/20/84
1984-III	8	9/16/84		9/84	9/20/84
1984-III	9	10/23/84		10/84	10/19/84
1984-IV	11	12/5/84		12/84	12/19/84
1984-IV	12	1/30/85		1/85	1/22/85
1985-I	2	3/12/85		3/85	3/21/85
1985-II	4	5/6/85		5/85	5/21/85
1985-II	5	6/25/85		6/85	6/20/85
1985-III	7	8/6/85		8/85	8/20/85
1985-III	8	9/16/85		9/85	9/20/85
1985-III	9	10/23/85		10/85	10/18/85
1985-IV	11	12/5/85		12/85	12/23/85
1985-IV	12	1/28/86		1/86	1/22/86
1986-I	2	3/20/86		3/86	3/19/86
1986-II	4	5/6/86		5/86	5/20/86
1986-II	5	6/24/86		6/86	6/18/86
1986-III	7	8/5/86		8/86	8/19/86
1986-III	8	9/10/86		9/86	9/18/86
1986-III	9	10/23/86		10/86	10/21/86
1986-IV	11	12/1/86		12/86	12/17/86
1986-IV	12	1/28/87		1/87	1/22/87
1987-I	2	3/16/87		3/87	3/18/87
1987-II	4	5/4/87		5/87	5/20/87
1987-II	5	6/23/87	6/15/87	6/87	6/17/87
1987-III	7	8/3/87	7/28/87	8/87	8/19/87
1987-III	8	9/8/87	8/28/97	9/87	9/18/87
1987-III	9	10/21/87	10/9/87	10/87	10/21/87
1987-IV	11	12/1/87	11/20/87	12/87	12/17/87
1987-IV	12	1/27/88	1/15/88	1/88	1/27/88
1988-I	2	3/15/88	3/8/88	3/88	3/23/88
1988-II	4	5/4/88	4/26/88	5/88	5/26/88
1988-II	5	6/15/88	6/7/88	6/88	6/23/88
1988-III	7	8/2/88	7/26/88	8/88	8/25/88
1988-III	8	9/6/88	8/30/88	9/88	9/20/88
1988-III	9	10/18/88	10/11/88	10/88	10/26/88
1988-IV	11	11/30/88	11/18/88	12/88	12/20/88
1988-IV	12	1/25/89	1/13/89	1/89	1/27/89
1989-I	2	3/15/89	3/8/89	3/89	3/23/89
1989-II	4	5/3/89	4/25/89	5/89	5/25/89
1989-II	5	6/21/89	6/12/89	6/89	6/22/89
1989-III	7	8/9/89	8/1/89	8/89	8/29/89
1989-III	8	9/20/89	9/12/89	9/89	9/21/89

Year, quarter of real GDP	Month attributed to independent variables	Beige Book release date	Beige Book closing date[a]	Release month of Blue Chip, employment, industrial production and retail sales[b]	Release date of BEA estimates of GDP
1989-IV	10	11/1/89	10/20/89	11/89	11/29/89
1989-IV	11	12/6/89	11/28/89	12/89	12/20/89
1989-IV	12	1/24/90	1/13/90	1/90	1/26/90
1990-I	2	3/14/90	3/6/90	3/90	3/28/90
1990-II	4	5/2/90	4/20/90	5/90	5/24/90
1990-II	5	6/20/90	6/8/90	6/90	6/21/90
1990-III	7	8/8/90	7/27/90	8/90	8/24/90
1990-III	8	9/19/90	9/11/90	9/90	9/25/90
1990-IV	10	10/31/90	10/19/90	11/09	11/28/90
1990-IV	11	12/5/90	11/26/90	12/90	12/19/90
1990-IV	12	1/23/91	1/14/91	1/91	1/25/91
1991-I	2	3/13/91	3/4/91	3/91	3/27/91
1991-II	4	5/1/91	4/22/91	5/91	5/29/91
1991-II	5	6/19/91	6/10/91	6/91	6/26/91
1991-III	7	8/7/91	7/29/91	8/91	8/28/91
1991-III	8	9/18/91	9/9/91	9/91	9/26/91
1991-III	9	10/23/91	10/11/91	10/91	10/29/91
1991-IV	11	12/4/91	11/25/91	12/91	12/20/91
1991-IV	12	1/22/92	1/13/92	1/92	1/29/92
1992-I	2	3/18/92	3/9/92	3/92	3/26/92
1992-II	4	5/6/92	4/27/92	5/92	5/29/92
1992-II	5	6/17/92	6/9/92	6/92	6/25/92
1992-III	7	8/5/92	7/28/92	8/92	8/27/92
1992-III	8	9/23/92	9/15/92	9/92	9/24/92
1992-IV	10	11/4/92	10/27/92	11/92	11/25/92
1992-IV	11	12/9/92	12/1/92	12/92	12/22/92
1992-IV	12	1/20/93	1/12/93	1/93	1/28/93
1993-I	2	3/10/93	3/1/93	3/93	3/26/93
1993-II	4	5/5/93	4/23/93	5/93	5/28/93
1993-II	5	6/23/93	6/15/93	6/93	6/23/93
1993-III	7	8/4/93	7/27/93	8/93	8/31/93
1993-III	8	9/8/93	8/31/93	9/93	9/29/93
1993-IV	10	11/3/93	10/26/93	11/93	12/1/93
1993-IV	11	12/8/93	11/29/93	12/93	12/22/93
1993-IV	12	1/19/94	1/10/94	1/94	1/28/94
1994-I	2	3/9/94	2/28/94	3/94	3/31/94
1994-II	4	5/4/94	4/25/94	5/94	5/29/94
1994-II	5	6/22/94	6/14/94	6/94	6/29/94
1994-III	7	8/3/94	7/25/94	8/94	8/26/94
1994-III	8	9/14/94	9/6/94	9/94	9/29/94
1994-IV	10	11/2/94	10/25/94	11/94	11/30/94
1994-IV	11	12/7/94	11/29/94	12/94	12/22/94
1994-IV	12	1/18/95	1/10/95	1/95	1/27/95
1995-I	2	3/15/95	3/6/95	3/95	3/31/95
1995-II	4	5/10/95	5/1/95	5/95	5/31/95
1995-II	5	6/21/95	6/12/95	6/95	6/30/95
1995-III	7	8/9/95	7/31/95	8/95	8/30/95
1995-III	8	9/13/95	9/5/95	9/95	9/29/95
1995-IV	10	11/1/95	10/24/95	11/95	[c]
1995-IV	11	12/6/95	11/27/95	12/95	1/19/96
1995-IV	12	1/17/96	1/8/96	1/96	2/23/96
1996-I	2	3/13/96	3/4/96	3/96	4/2/96
1996-II	4	5/8/96	4/30/96	5/96	5/30/96
1996-II	5	6/19/96	6/11/96	6/96	6/28/96
1996-III	7	8/7/96	7/30/96	8/96	8/29/96
1996-III	8	9/11/96	9/4/96	9/96	9/27/96
1996-IV	10	10/30/96	10/22/96	11/96	11/27/96
1996-IV	11	12/4/96	11/23/96	12/96	12/20/96
1996-IV	12	1/22/97	1/13/97	1/97	1/31/97

NOTES: [a]The Beige Book closing date was not published before June 1987. [b]This refers to the month in which the data series was released. Typically, the employment report (for the previous month) is released the first Friday of the month, the Blue Chip consensus forecast is released around the tenth of the month, and the previous month's industrial production and retail sales are released mid-month. [c]GDP estimates were not released in this period due to the Federal Government shutdown.

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