



The Response of Small Business Owners to Changes in Monetary Policy

WILLIAM C. DUNKELBERG and JONATHAN A. SCOTT*

The small business sector of the economy accounts for half of private gross domestic product and well over half of private sector employment. Little is known about how these firms and the banks that serve them are affected by changes in monetary policy. Using data from the monthly surveys of the members of the National Federation of Independent Business, the impact of unexpected (between meeting) Federal Reserve announcements on owner expectations and hiring and spending plans are examined. Using interviews filled out during the month, “before” and “after” groups are analyzed to assess the impact of Federal Reserve announcements on firm behavior. Narrowing the analysis period to just days before and after Federal Reserve announcements permits the assessment of owner responses uncontaminated by other events. Changes in owner expectations and spending and hiring plans are shown to be translated into subsequent changes in actual spending and hiring that are often the opposite of what is suggested by conventional economic theory. Firms that do not use debt respond in the same way as those regularly active in credit markets. The results provide additional insight and richness to our understanding of the transmission channels through which monetary policy impacts the real economy.

Business Economics (2009) **44**, 23–37.

doi:10.1057/be.2008.6

Keywords: *monetary policy, monetary policy transmission, small business, Federal Reserve announcements*

The transmission channels through which changes in monetary policy affect private sector spending and hiring are incompletely understood, especially in the small business sector. Most research to date has been based on analysis of time series aggregate data on investment spending (including housing). However, the small business sector, which is responsible for most of the job growth and innovation in the U.S. economy and half of private sector gross domestic product (GDP), is quite different from the population of larger firms that has been the traditional focus of investment studies and monetary policy.¹

This study documents how small firms react to unexpected changes in monetary policy.² Monthly survey data obtained from the National Federation of Independent Business (NFIB) illustrate how owner expectations are affected by these changes, with corresponding adjustments to spending and hiring plans, and ultimately changes in actual spending and hiring. These expectation and plan variables have been shown to be significantly related to spending and hiring at the macro level with a short lag [Dunkelberg, Scott, and Dennis 2003]. Thus, the results can provide some new micro

¹See <http://app1.sba.gov/faqs/faqindex> for the response to the Frequently Asked Question: “How important are small businesses to the economy?”

²This project received support from the Small Business Administration (SBAHQ04M0450) and the NFIB Research Foundation.

*William C. Dunkelberg is the Chief Economist of the National Federation of Independent Business and professor of economics and former Dean, School of Business and Management, Temple University. Dr. Dunkelberg is also Chair of the Global Interdependence Center and Chairman of the Board of Liberty Bell Bank. He received BA, MA, and Ph.D. degrees in economics from the University of Michigan and has served on the faculties of the University of Michigan, Stanford University, and Purdue University. He also served as Study Director at the Survey Research Center, with responsibility for the Survey of Consumer Finances. Jonathan A. Scott is an associate professor of finance at the Fox School of Business at Temple University and an adjunct scholar with the National Federation of Independent Business Research Foundation. He is currently the interim director of the Fox School Honors program and managing director of the Fox School’s student managed investment fund. His research focuses on small business access to credit markets, with publications in a number of financial and small business journals. Prior to joining Temple, he was a senior financial executive at the Federal Home Loan Bank of Dallas during the thrift crisis in the mid- to late 1980s. He received his BA in economics from the University of Cincinnati and his MS and Ph.D. in economics from Purdue University.

level insight into how quickly changes in monetary policy work through the small business sector—and ultimately the aggregate real economy—and the direction of the effects of policy changes.

1. The Monetary Policy Transmission Mechanism

There are several schools of thought regarding the channels through which monetary policy exercises its influence on real economic activity. Recently popular is the *asset price* view [Taylor 1995]. This view focuses on the impact of changes in interest rates on the spending decisions of businesses and households through changes in asset values and exchange rates. The higher the market rate of interest, the fewer the number of investment opportunities whose rate of return exceeds the cost of capital and, consequently, the lower the level of investment spending. Also, rising interest rates change the price of current consumption and reduce financial market wealth, adversely affecting current consumption. Except for new housing (treated as part of gross private domestic investment), little empirical evidence is available to support the notion that interest rate changes have a strong direct effect on consumer spending. However, it appears that changes in asset values that are viewed as permanent do have a modest effect on consumer spending.

A second view focuses on the supply of credit and the lending criteria of banks. In this view, banks may not allocate credit simply through changes in the price of credit. They may also refuse to take on certain credit risks and not lend at any price (rationing). This *credit supply* view sees monetary policy producing changes in credit standards at lenders as well as in rates charged as the monetary transmission channel [Bernanke and Gertler 1995]. If the transmission channel is through the supply side (changes in banks' risk tolerance and lending standards), many firms will not notice the effect of changes in monetary policy until they apply for a new loan or a renewal (which many never do or do irregularly).³ But, a simple model for affecting economic agents is not likely to be all-encompassing, leading to the observation that "... monetary policy works at least in part through 'credit' (i.e., bank

loans) as well as through 'money' (i.e., bank deposits)" [Bernanke and Blinder 1992].

Other views rely on various structural rigidities in the economy that influence the transmission of monetary policy effects (the friction transmission view) to the real sector. Rigidities in the wage structure, price setting, or the ability of economic agents to reallocate assets in their portfolios explain why changes in nominal variables like the money supply or credit can affect real variables [Christiano, Eichenbaum, and Evans 1997]. These models typically depend on expectations of future inflation or nominal returns to drive decision-making as the means of transmitting the effects of monetary policy to real variables.

It is less clear how the friction transmission model works at the micro level. According to Christiano and others: "The first friction is that some firms do not immediately adjust prices in response to monetary policy shocks while ex post, output is demand determined. The effect of this friction is that aggregate output falls in response to a monetary contraction. The second friction is that households do not immediately adjust their nominal saving in response to monetary policy shocks. The effect of this friction is that monetary contractions disproportionately affect the reserves of banks and, hence, the supply of loanable funds. The result is a rise in interest rates which induces firms who need working capital to cut back on their scale of operations and aggregate output declines" [Christiano, Eichenbaum, and Evans 1997, p. 1203]. The limited participation model is driven by "assuming that, in any given period, households must determine how much money to deposit with financial intermediaries prior to the realization of the monetary shock" [Christiano, Eichenbaum, and Evans 1997, p. 1203]. The sticky price version requires that intermediate goods producers set their prices first, then the policy change occurs, and output is demand-determined based on prices set before the policy change. Ultimately, it appears that firms are confronted with interest rate or credit availability changes that affect real variables. If a firm does not borrow in the period (or ever), these changes will not matter.

Another channel for monetary policy transmission is suggested by rational expectations theory. Decision makers use the information provided by policymakers' actions to predict future values of important variables such as company sales and then to make relevant spending decisions in the current period, not just in future periods. This view

³Forty-four percent of NFIB members recently reported no business debt [Scott, Dunkelberg, and Dennis 2003]. A growing exception to this may be the transmission of policy changes through lines of credit and variable rate commercial loans, now much more prevalent than a decade or two ago. Over 60 percent of NFIB members now have a line of credit tied to the Prime Rate or Libor.

is especially pertinent to owners of firms that are continuously making revenue, price, and labor cost forecasts. These forecasts form the basis for plans to hire and spend in current and in future periods. If changes in monetary policy announced to the public affect these forecasts, then changes in policy will immediately affect spending and hiring, long before business owners react when they apply for a loan or before the effect of policy shows up as a change in the number of customers coming in the front door (for example, fewer home buyers in response to higher long-term rates).

Furthermore, many business owners have no debt, do not use credit, and have no assets other than their homes and businesses. If these owners use the information conveyed by changes in Federal Reserve policy to formulate forecasts of future economic activity and act on those expectations, monetary policy can still have an effect on these firms. This approach, however, does not produce clear and reliable predictions of the response to changes in monetary policy [Juks 2004], because the response to a change in the Federal Funds target may depend not on the direction and size of the interest rate change but on how the change is interpreted in the context of economic conditions.

With the exception of the rational expectations perspective, the other views of how monetary policy transmission occurs have some shortcomings when applied to the small business sector. Although banks are not the primary source of capital for starting a new firm, they are the primary source of funds for small firms once started, providing working capital and funding for investment in plant and equipment [Dunkelberg and Cooper, 1983; Berger and Udell 1998]. Changes in the cost and availability of funds at banks that result from changes in monetary policy could have an important effect on small firm spending. But changes in loan terms and owner responses to these changes as they come to banks for capital take time to develop.

Changes in interest rates will have no direct impact on firms that do not borrow and those that borrow irregularly. (However, their customers might be impacted by the policy change.)⁴ If loans

only re-price every five years, the effect of interest rate changes on many decision makers is muted, limited only to owners borrowing or re-pricing in the current period and to those with variable priced loans (increasing in frequency and perhaps making the economy more sensitive to monetary policy shifts). Just how these less active credit market participants would be directly affected by changes in monetary policy through the asset price/interest rate mechanism is not clear in traditional models of the transmission of monetary policy effects.

A rational expectations model may more accurately describe how small firms react to (unexpected) changes in monetary policy; but this model, as noted above, does not provide clear predictions of the owner response. Some proportion of the population of small business owners follows the news and uses that information to make forecasts of future values of important variables (sales, input prices, wages, and so on) and ultimately acts on these forecasts. Expectations are modified immediately and spending plans changed in response to an announced change in monetary policy. Thus, real variables as well as prices will respond to changes in policy, possibly quite quickly. However, a given policy change—say a rate cut (that arguably should affect long-term rates as well)—may not immediately affect spending in the manner predicted by the investment or credit channel views. Rate cuts might be followed by cuts in investment spending, for example, rather than increases, as conventional theory suggests, if the policy change is interpreted as a signal of a weakening economy.

This perspective does not in any way invalidate the importance of interest rates or bank lending policies as vehicles for transmitting monetary policy effects. It does, however, broaden the potential effect of policy changes by including agents who are not active participants in capital markets but that generate significant amounts of output and jobs. This perspective also accommodates a more rapid response to changes in monetary actions, independent of the degree of capital market participation of firms.

The NFIB data do not lend themselves to longitudinal studies of the longer term effects of changes in monetary policy because each survey is based on a new random sample of the membership, not re-interviews; and the questions used in the survey instrument have very short horizons (six months at the most). Summary statistics from each

⁴Berger and Udell [1998] report that slightly over 25 percent of small firms have debt from financial institutions. After financial institutions, trade credit (18 percent) is the next largest source of nonequity external financing. Also, the percent of firms reporting regular borrowing in the NFIB monthly surveys have averaged 38 percent between 1973 and 2007, with a low of 31 percent and a maximum of 53 percent.

monthly survey have been shown to be significantly related to macroeconomic measures of spending and hiring over time [Dunkelberg, Scott, and Dennis 2003], but the microeconomic level responses of business owners to policy changes from this data have not been documented.

This paper will show that:

- there is an immediate response to announcements of unexpected changes in monetary policy;
- the responses immediately affect hiring and spending activity; and
- the immediate responses of business owners are often inconsistent with those implied by conventional theory or by time series macroeconomic models of the impact of monetary policy on real variables.

Response lags to monetary policy can be long and variable (with appropriate signs), but there are significant responses that are immediate and often contradictory to the longer term objectives of the Federal Reserve. This will be illustrated by documenting the changes in important business owner plans and expectations that occur within days of a Federal Reserve announcement and persist for a month or more. Identifying owner responses that are uniquely tied to a particular Federal Reserve action for more than a month becomes complicated by the intrusion of other economic events, including the fact that rate changes typically do not occur as one-off events but as part of a succession of rate changes.

Although the results below suggest that small business reactions to monetary policy changes are often contrary to conventional theory, we regard them as an expansion of our understanding of how monetary policy is transmitted to the real economy: they do not invalidate the importance of interest rates and bank lending policies in the transmission process and provide insight into the question raised by Sims and Zha [2006].

2. Data

This paper uses data collected from thousands of small business owners by the NFIB to identify the responses of owners to changes in monetary policy.⁵ Since October 1973, NFIB has surveyed a random sample of its membership in the first

month of each quarter about their businesses and the economy. Questionnaires are mailed on the first day of the month, with a repeat mailing 10 days later (duplicate responses are eliminated). Beginning with 1986, the surveys were conducted monthly. In addition to the questions detailed above, basic descriptive data were also collected (industry, sales, sales change, state, size of community, and so on). In the first month of each quarter, sample size ranges from 1,200 to 2,500. In the remaining two monthly surveys, sample size ranges from 400 to 900 observations.⁶ Because surveys are filled out over the period of a month, the responses can be segregated into subgroups in such close proximity to an event that the likelihood from contamination from other events can be dismissed.

The firms surveyed are members of a very important part of the overall economy. The Small Business Administration (SBA) website provides recent research documenting the size and importance of the small business sector of the U.S. economy.¹ Small businesses produce roughly half of the private sector GDP and employ an even larger percentage of the private sector labor force. Studies suggest that nearly 70 percent of the net job creation in the United States is done by small firms with fewer than 20 employees. There are approximately six million employers in the United States, 90 percent with fewer than 20 employees. There are an additional eight million or so individuals who are the only employees of their small enterprise but derive the majority of their income from the business.

The NFIB data set contains a rich collection of information that permits the identification of responses to changes in monetary policy. The following survey questions address owner expectations about the economy and the business environment.

- Do you think the next three months will be a good time for small business to expand substantially?
- About the economy in general, do you think that six months from now general business conditions will be better than they are now, about the same, or worse?
- Overall, what do you expect to happen to the real volume (number of units) of goods and/or

⁵The NFIB has about 500,000 member firms. At the beginning of the studies in 1973, membership was about 250,000.

⁶A copy of an analysis of a recent survey report that contains all of the questions and a recent time series of responses can be found at this site: http://www.nfib.com/object/IO_24069.html.

services that you will sell during the next three months?

- At the present time, do you feel your inventories are too large, about right or inadequate?
- Do you expect to find it easier or harder to obtain your required financing during the next three months?
- Do you have any job openings that you are not able to fill right now?

These expectations may be translated into changes in owner plans to adjust major real variables such as hiring, capital spending, inventory investment, as well as worker compensation and selling prices. The plans are addressed as follows:

- In the next three months, do you expect to increase or decrease the total number of people working for you?
- Looking ahead to the next three to six months, do you expect to make any capital expenditures for plant and/or physical equipment?
- Looking ahead to the next three to six months, do you expect, on balance, to add to your inventories, keep them about the same, or decrease them?
- In the next three months, do you plan to change the average selling prices of your goods and/or services?
- Do you plan to change average employee compensation (wages and benefits, but not Social Security, unemployment compensation, taxes, and so on) during the next three months?

Finally, the survey contains questions on actual changes in hiring, capital spending, inventories, prices, labor compensation, and the ease or difficulty in obtaining financing:

- During the last six months, has your firm made any capital expenditures to improve or purchase equipment, buildings, or land?
- In the last three months, did the total number of employees in your firm increase, decrease, or stay about the same?
- During the last three months, did you increase or decrease your inventories?
- How are your average selling prices now compared to three months ago?
- Over the past three months, did you change average employee compensation, including wages and benefits, but not Social Security or unemployment compensation taxes?

- Are loans easier or harder to get than they were three months ago?
- What is the single most important problem facing your business today?

3. Small Firm Responses to Monetary Policy Changes

The most promising opportunities for detecting the effect of monetary policy changes on small businesses are the unexpected intermeeting announcements, making a before/after comparison of measurements more likely to reveal whatever responses occurred. If a rate change was expected, owners could have made adjustments prior to the actual announcement, making it more difficult to identify responses to policy changes.

The April 2001 surprise decrease

In January 2001, the FOMC cut the Federal Funds rate by 50 basis points to 5½ percent. This was followed by a reduction of an additional 50 basis points on March 20 at the regular FOMC meeting. At this meeting, a number of FOMC members had favored a 75-basis-point cut, which might have been a clue that an intermeeting cut was a possibility had minutes been available. Then, on April 18, Chairman Greenspan announced another 50-basis-point cut to 4½ percent—the “April surprise.” At the regular meeting on May 20, the Federal Funds target was cut another 50 basis points to four percent. Although the April 18 reduction between meetings was unexpected, at least to the extent that it was not at a regular meeting, the trend of cutting rates was clearly established, and additional cuts could have been expected. However, the intermeeting timing may have signaled more concern with the course of the economy than a cut at a regularly scheduled meeting.

The monthly data were bifurcated on the date of the policy change (1,043 “before” observations, 473 “after”). An examination of the news archives for any other surprise economic announcements within 15 days of the Federal Reserve’s announcement in April revealed nothing unusual, suggesting that the observed response of owners to the surprise policy announcement was not seriously contaminated by other events. A similar procedure was used to identify and assess other intermeeting policy announcements.

There is no a priori reason to expect that the respondents in the latter part of the month are any

different from those responding in the first part of the month, and this was confirmed by an analysis that compares demographic and financial characteristics for the pre- and postchange groups. There is no statistically significant difference between the characteristics of the two groups. Additionally, the questionnaire is mailed to the full sample on the first day and on the 10th of each month (duplicates removed). Ninety-eight percent of the “before” population responded to the first mailing and 88 percent of the “after” sample responded to the second mailing. This eliminates the “tail” of the response to the second mailing, because no interviews are accepted after the last day of the month. Given the above, considering each group as a random sample of the NFIB membership would seem to be a reasonable assumption for analytical purposes. Even if the two samples differ based on some unobserved owner characteristic, the size of the affected group and its response is significantly different and important enough to affect the macro response to changes in monetary policy. Overall, 21 percent of the owners contacted by mail responded to the questionnaire, 71 percent were from the first mailing and 29 percent from the second mailing 10 days later.

Table 1 shows the pre- and postchange statistics for the expectations variables. The announcement clearly had an adverse impact on owner expectations. The percent of owners viewing the current period as a good time to expand fell three points, an adverse move of 3 percentage points. The percent expecting the economy to be better in six months fell two points, and those expecting the economy to worsen rose three points for a net deterioration of five points. The net percent of owners expecting higher real sales volumes deteriorated by 15 points. Current inventory stocks became less desirable (a three-point deterioration). And, in spite of the rate cuts, the percent of owners expecting easier credit conditions actually deteriorated by one point. For the six variables, five changes were negative; and one registered no change. Although trends in the economy were weak at the time, changes in the expectations variables of the magnitudes recorded are not very likely to be attributable to changes in the economy occurring in the month of April.

Plans to hire, make capital outlays, and invest in inventories were similarly affected by the surprise 50-basis-point cut, as shown in Table 2.

Although the percent of owners with unfilled job openings did not change, the percent of owners planning to create new jobs fell three points; and the percent planning to reduce employment rose two points, for a net deterioration of five points in job creation plans. Similarly, capital spending plans lost three points. Plans to raise selling prices were adversely affected, losing six points. Similarly, plans to raise worker compensation deteriorated three points. It appears that even though the surprise cut occurred in the middle of a string of rate cuts, the effect of the announcement conveyed a negative signal about economic prospects that produced significant downward revisions in spending and hiring plans and pricing decisions.

Using a sampling error of ± 3 percentage points, nine of the 11 changes in the expectations variables are significant at the 95 percent level.⁷ If the announcement had no effect, then the changes might be expected to be equally positive and negative (random changes within a 30-day period). Over the 11 variables, 10 changes were negative and one was unchanged.

The premise of this paper is that the actions of the Federal Reserve will affect real economic variables not just through the impact of their actions on interest rates (cost of capital) or on the availability of credit (nonprice lender rationing) but through revisions in expectations of all owners—whether they participate in credit markets or not—that alter their spending and hiring decisions. The second and third panels of Tables 1 and 2 compare the responses of owners that report “borrowing at

⁷Sampling errors for these percentages, developed by the Survey Research Center at the University of Michigan, are as follows:

Reported Percentage	2 Std. Errors (95 percent Confidence)		
	Sample = 500	Sample = 1,000	Sub-Group
50 percent	4.9	3.6	—
30 or 70 percent	4.5	3.3	5.8
20 or 80 percent	3.9	2.9	4.7
10 or 90 percent	2.9	2.2	3.5
5 or 95 percent	2.1	1.8	2.6

The numbers are 95 percent confidence intervals for comparisons of statistics between two subgroups of the same sample of size 1,000 and 500, respectively.

Table 1. Changes in Owners' Expectations, Pre- and Post-April 18, 2001 Surprise Announcement

Owner Expectation Questions	Full Sample				Don't Borrow Regularly				Borrow Regularly			
	Before	After	Change	Net change	Before	After	Change	Net change	Before	After	Change	Net change
Is the current period a good time to expand?												
Yes	14	11	-3	-3	13	10	-3	-3	15	14	-1	-1
Net % expecting economy to be better in six months												
Better	32	30	-2	—	31	29	-2	—	34	31	-3	—
Worse	16	19	3	-5	17	18	1	-3	16	20	4	-7
Expectations for real sales volumes												
Go up	52	43	-9	—	51	42	-9	—	52	44	-8	—
Go down	18	24	6	-15	18	24	6	-15	20	24	4	-12
Hard to fill job openings												
Yes	27	27	0	0	25	23	-2	-2	29	36	7	7
Current inventory satisfaction												
Too low	7	6	-1	—	5	4	-1	—	10	8	-2	—
Too large	11	13	2	-3	8	10	2	-3	15	17	2	-4
Expected change in ease of getting loans												
Easier	3	2	-1	—	2	2	0	—	4	4	0	—
Harder	9	9	0	-1	3	3	0	0	21	19	-2	2
Sample size	1,043	473	—	—	672	301	—	—	371	172	—	—
Net change = The change in the % with a favorable response less the % with an unfavorable response												

Table 2. Changes in Owners' Plans, Pre- and Post-April 18, 2001 Surprise Announcement

Owners' Plan Questions	Full Sample				Don't Borrow Regularly				Borrow Regularly			
	Before	After	Change	Net change	Before	After	Change	Net change	Before	After	Change	Net change
Plan to change average selling prices												
Raise	24	18	-6	—	24	17	-7	—	24	19	-5	—
Lower	4	4	0	-6	4	4	0	-7	3	6	3	-8
Plan to increase or decrease total employment												
Increase	25	22	-3	—	23	18	-5	—	27	27	0	—
Decrease	4	6	2	-5	3	6	3	-8	5	5	0	0
Plan to increase/decrease inventories												
Increase	19	15	-4	—	17	13	-4	—	23	19	-4	—
Decrease	12	14	2	-6	9	12	3	-7	16	19	3	-7
Plan capital expenditures												
Yes	34	31	-3	-3	33	31	-2	—	36	32	4	—
Plan to change employee compensation												
Increase	19	16	-3	—	18	14	-4	—	21	20	1	—
Decrease	1	1	0	-3	0	0	0	-4	1	1	0	1
Sample size	1,043	473	—	—	672	301	—	—	371	172	—	—

least once a quarter” and those that borrow less frequently or never.⁸ The perceptions of the two groups of owners were very different regarding the implications of Federal Reserve actions for credit market conditions. Infrequent borrowers did not interpret Federal Reserve actions as having an effect on credit market conditions (and did not care). The percent of owners expecting credit conditions to improve or become more difficult was virtually unchanged after the surprise announcement. For frequent borrowers, the Federal Reserve cut did result in a two-point decline in the percent of owners expecting credit conditions to become “harder,” from 21 percent expecting “harder” to 19 percent (a change in the expected direction, but not significant). Four percent expected “easier” credit conditions before and after the announcement.

In terms of expectations for the economy, the response of both groups to the announcement was virtually the same—a significant deterioration in the outlook and in plans to hire and spend (only the percent of firms reporting hard-to-fill job openings deviated, with borrowers reporting an increase in job openings, an unexpected outcome). This result provides support for the rational expectations view of monetary policy transmission. With both borrowers and nonborrowers responding similarly, it is clear that the Federal Reserve announcement was likely to have a negative effect on aggregate spending and hiring by motivating owners to reduce spending and hiring in future periods.⁹

Looking at the before/after responses in the context of a longer time frame, the evidence that the announcement effects were significant still appears compelling, although interpretation is more difficult since determining what the expected change in a variable should be is not always clear and the surprise cut occurred in the context of four 50-basis-point reductions in a six-month period. Table 3 shows the values of the expectations and plans questions six months before the surprise and six months after. The last column shows the net adverse change in each indicator. The percent of

firms expecting business conditions to be better six months later displayed a five-point deterioration in the balance. But over the next six months, the mean of the positive and negative response categories moved 17 points to the positive side (intervening economic developments likely affected these assessments). This change could be a result of growing confidence that the additional cuts made in the six months following the April announcement were sufficient to remedy the weakness in the economy. It could also be a result of changes in actual business conditions in the six months after April. A review of the headlines over this period uncovered no other shocks that would have had a large impact on owner expectations and plans beyond the trend in the economy and the fact that 2001 was the middle of a rate-cutting episode.

Capital spending plans may provide a cleaner test of the effect because capital spending plans embody a longer operating horizon than changing inventories or employment. Capital spending plans gave up three points on the announcement and twice that amount over the next six months, a significant deterioration. Overall, nine of the 11 variables posted declines (unfavorable outcomes) and six of the changes were significant.

The evidence from the April surprise announcement on owner expectations and spending plans indicates that the intermeeting rate cut had a continuing adverse effect. For 11 measures, virtually all registered a significant decline and the signs of change were all as expected (expected credit conditions improved slightly and plans to raise worker compensation fell). Over the six-month period following the announcement, spending plans, hiring plans, and job openings all deteriorated significantly as well, but responses in these months were affected by further policy changes and changes in economic conditions, making interpretation of the results less reliable even if consistent with the hypotheses. Indicators of credit market conditions were statistically unchanged over the 12-month period. The percent of firms borrowing regularly, the percent reporting credit easier or harder to get, the percent reporting expected credit conditions to worsen or improve, and the percent of owners reporting credit supply and cost as their number one business problem were virtually unchanged.

The rational expectations model of transmission is not relevant if changes in plans and expectations have no impact on spending and hiring (or are quickly reversed before spending changes).

⁸See Scott, Dunkelberg, and Dennis [2003]. Thirteen percent reported never applying for a loan and nine percent did not respond to the question asking for the last time the owner applied for a loan.

⁹See Dunkelberg, Scott, and Dennis [2003]. The NFIB indicators are significant leading predictors of the inflation rate, the unemployment rate, and other macro measures of economic activity.

Table 3. Changes in Owners' Expectations, Six Months Before and After April 2001 Surprise Announcement
(Percent)

Variable	2000			2001										Net change	Std. dev.				
	Oct	Nov	Dec	April					6 Month Mean										
	Oct	Nov	Dec	Jan	Feb	Mar	Before	After	May	Jun	Jul	Aug	Sep	Oct	Before	After	Change		
Is the current period a good time to expand?																			
Yes	14	11	11	11	13	17	14	11	16	12	12	12	8	9	12.8	11.5	-1.3	-1.3	2.46
Expecting economy to be better in six months																			
Better	11	14	14	22	28	32	32	30	31	28	31	31	31	36	20.2	31.3	-11.2	—	7.95
Worse	21	21	29	26	21	18	16	19	13	19	15	14	22	19	22.7	17.0	5.7	-16.9	4.42
Expectations for real sales volumes																			
Go up	35	29	30	35	44	50	52	43	48	40	38	41	29	25	37.2	36.8	-0.3	—	8.43
Go down	30	32	34	30	23	18	18	24	15	23	22	24	36	41	27.8	26.8	-1.0	-1.3	7.57
Plan to change average selling prices																			
Raise	27	30	26	30	26	23	24	18	22	20	19	18	16	15	27.0	18.3	-8.7	—	4.94
Lower	4	3	4	4	3	5	4	4	3	3	4	4	4	5	3.8	3.8	0.0	-8.7	0.66
Plan to increase or decrease total employment																			
Increase	17	15	16	23	25	27	25	22	22	16	17	20	17	12	20.5	17.3	-3.2	—	4.48
Decrease	9	10	8	6	6	5	4	6	6	5	7	8	12	11	7.3	8.2	0.9	-4.1	2.41
Hard to fill job openings																			
Yes	33	35	31	29	30	25	27	27	27	27	26	31	27	22	30.5	26.7	-3.8	-3.8	3.39
Current inventory satisfaction																			
Too large	11	11	13	12	12	11	11	13	13	11	12	12	12	13	11.7	12.2	0.5	—	0.83
Too low	7	7	7	9	10	6	7	6	7	7	7	7	6	6	7.7	6.7	-1.0	-1.5	1.14
Plan to increase/decrease inventories																			
Increase	14	14	14	19	23	17	19	15	16	15	13	14	13	12	16.8	13.8	-3.0	—	3.01
Decrease	17	14	18	13	14	9	12	14	13	13	15	14	16	17	14.2	14.7	0.5	-3.5	2.33
Expected change in ease of getting loans																			
Easier	1	1	1	1	2	1	3	2	2	2	2	2	2	2	1.2	2.0	0.8	—	0.61
Harder	8	8	8	7	6	6	9	9	8	6	7	6	10	8	7.2	7.5	0.3	0.5	1.28
Plan capital expenditures																			
Yes	33	34	34	32	38	33	34	31	31	30	27	28	28	27	34.0	28.5	-5.5	-5.5	3.20
Plan to change employee compensation																			
Increase	21	22	24	23	19	22	19	16	19	16	14	16	13	14	21.8	15.3	-6.5	—	3.63
Decrease	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1.0	1.3	0.3	6.8	0.36

Prior work [Dunkelberg, Scott, and Dennis 2003] shows a strong relationship between NFIB measures and important measures of macroeconomic activity, such as the quarterly unemployment rate (UNERATE) and inflation rate (CPIINFL). The NFIB predictors in the unemployment equation are HIREPLAN (the expected increase or decrease in

the total number of employees) and JOBOPEN (the percent reporting job openings that are not currently filled). For the inflation equation, the predictors are PLANP (the net percent of owners planning to increase average selling prices over the next three months) and PASTP (the net percent reporting increases in average selling prices over the

past three months). HIREPLAN, JOBOPEN, PASTP, and PLANP are significant predictors (t -statistics shown in parentheses below the coefficients) with a one-period (three-month) lag:

$$\begin{aligned} \text{UNERATE} = & 9.23 - 0.06 \text{HIREPLAN}_{-1} \\ & \quad (4.3) \\ & - 0.12 \text{JOBOPEN}_{-1}, \\ & \quad (9.2) \\ & R^2 = 0.91, \end{aligned}$$

$$\begin{aligned} \text{CPIINFL} = & -0.55 + 0.16 \text{PLANP}_{-1} \\ & \quad (2.0) \\ & + 0.08 \text{PASTP}, \\ & \quad (6.7) \\ & R^2 = 0.72. \end{aligned}$$

The immediate change in the independent variables reported in Tables 1 and 2 after the April 2001 announcement included a decline in the percent of owners planning to increase employment (HIREPLAN) by five points and a decline of six points in the percent planning to raise selling prices (PLANP). The decline in employment plans anticipates an increase in the unemployment rate of 0.3 points in the following quarter (the unemployment rate actually rose from 4.2 percent in 2001:1 to 4.4 percent in 2001:2 and 4.8 percent in 2001:3). For CPI inflation, the inflation rate was anticipated to decline by about 0.9 points (the actual CPI inflation rate fell from 3.8 percent in 2001:1 to 3.1 percent in 2001:2 and further in 2001:3). The changes in these important macro variables *after* the change in small business plans is consistent with the proposition that owners change their views based on the policy announcement and act on those views. For this unexpected change in Federal Reserve policy, its effect on small business plans and the ultimate transmission to employment and inflation was quick and substantial.

The April 1994 surprise increase

The April surprise change in the Federal Funds rates was not the only one during the Greenspan era, but is the only event where a pre- and post-change sample could be obtained from the respondents to the NFIB monthly surveys. It is useful, however, to examine owner responses in a different economic environment. Although a precise split of the sample is not possible, monthly data are available on both sides of every change in monetary policy. With little likelihood of contamination from other events in a matter of weeks, the April 1994

intrameeting increase in the Federal Funds target was selected for analysis. It occurred in the middle of a rate increase policy cycle. The Federal Reserve had already raised the Federal Funds rate by 25 basis points at its scheduled February and March meetings and by 50 basis points at its scheduled May meeting. As was the case for the April 2001 surprise rate cut, the April 1994 increase was unscheduled but may not have been a total surprise in the context of a series of rate increases.

At this time, the Federal Reserve was not publicly providing the context for the change as it does today, leaving more uncertainty about their forward thinking regarding the economy. Speculation about the response of owners (a signal that the expansion was strong and had some distance to go or that the rate hikes would signal the end of growth) produces weak priors as to how owners should have responded. However, the issue here is whether or not a significant response occurred, regardless of its character (or sign).

The April surprise occurred on the 18th, leaving only 12 days before the May survey was mailed to respondents. With no major news in that time, the May data may reasonably reflect the response of owners to the April surprise. Table 4 shows that in May, the percent of owners viewing the current period as a good time to expand fell three percentage points from March, with no change in those thinking it would not be a good time. All other measures suggest that owners responded positively to the rate hike (for example, the economy looked “hot,” and the Federal Reserve was trying to manage the growth). Of the six indicators, four exhibited significant change, indicating that the policy announcement significantly impacted expectations (and ultimately spending and hiring decisions). The textbook expectation is that raising interest rates should dampen economic behavior, but that is not evident from the data presented here, supporting the notion that responses to policy changes in interest rates are complex and involve more factors than simply the change in rates, such as expected future rates and values of other variables.

The unexpected increase in April 1994 did affect owner plans, with all five variables measuring spending and hiring plans and plans to change prices and compensation showing significant change, as shown in Table 4. Between March 1994 and May 1994, owners on net reduced their plans to increase total employment (a net decline of six

Table 4. Changes in Owners' Expectations, Pre- and Post-April 1994 Surprise Announcement (Percent)

Variable	Be- fore		After		Net Change	Seasonally adjusted
	Mar- 94	Apr- 94	May- 94	Change		
Is the current period a good time to expand						
Yes	19	18	16	-3		-4
Expecting economy to be better in six months						
Better	10	14	17	7		
Worse	33	33	28	-5	12	22
Expectations for real sales volumes						
Go up	32	33	34	2		
Go down	32	31	29	-3	5	10
Current inventory satisfaction						
Too low	8	9	10	2		
Too large	10	10	10	0	2	2
Expected change in ease of getting loans						
Easier	1	1	1	0		
Harder	8	8	9	1	-1	-1
Plan to change average selling prices						
Raiser	25	22	21	-4	—	—
Lower	2	2	2	0	-4	-2
Plan to increase or decrease total employment						
Increase	29	23	23	-6	—	—
Decrease	5	5	5	0	-6	-8
Hard to fill job openings						
Yes	3	4	6	3	3	1
Plan to increase/decrease inventories						
Increase	15	13	18	3	—	—
Decrease	16	18	14	-2	5	10
Plan capital expenditures						
Yes	38	35	32	-6	-6	-6
Plan to change employee compensation						
Increase	10	12	16	6	—	—
Decrease	1	4	2	1	5	5
Sample size	799	1,975	778	—	—	—

percentage points) and reduced capital expenditure plans (a net decline of eight percentage points). The plans to change average selling prices fell as well (a net decline of four percentage points), and plans to add to inventories strengthened. The frequency of plans to increase labor compensation increased

(a net increase of five percentage points), but plans to raise average selling prices faded (down four points). The internal consistency of these changes is not clear, but the changes are significant.

Some of the variables could be subject to substantial seasonal change over a two-month period (a problem eliminated when bifurcated samples within the month can be created). Thus, observed changes, positive or negative, could be the result of normal seasonal changes rather than a real response to the change in monetary policy. The changes observed in Table 4 are shown seasonally adjusted in the last column of the table. Four of the variables have no seasonal adjustments between March and May, so observed changes are already “seasonally adjusted.” Four others have adjustment factors that produce a difference between seasonally adjusted and unadjusted figures of two points or less. Three variables—expected business conditions, expected real sales volume changes, and inventory investment plans—have large seasonal adjustment factors, two with a five-point differential between March and May and one with a 10-point differential. The signs of the changes for the 11 variables are not changed using seasonally adjusted data, although two more of the changes are not significant using a three-point sampling error factor.

The unexpected rate cuts of September 2007 through January 2008

In August 2007, the Federal Reserve unexpectedly cut the discount rate by 50 basis points and encouraged banks to make use of the discount window without stigma. Based on 568 responses before the announcement and 152 post announcement responses, this had little impact on business owners. Job creation plans did fall three points, but capital spending plans (longer horizon) rose three points. Plans to sell off inventory fell four points (a positive result). The percent of owners viewing the current period as a good time to expand fell two points and, not surprisingly, the net percent of owners expecting improvements in real sales fell 11 points. The cut was surrounded by chatter about future slow economic growth. The August move occurred in the middle of a strong growth quarter with GDP advancing at a 4.8 percent annual pace. With so much conflicting opinion and the discount rate cut applying only to banks, the news was apparently “noise” to small business owners. Measures of credit market conditions showed no

Table 5. Changes in Owner Reports on Credit Conditions and Plans and Expectations Before and After Federal Reserve Policy Announcements

		Cut 9/18/07		Cut 10/31/07			Cut 1/22/08		
		Aug	Sept. Survey		Oct.	Nov.	Dec.	Jan. Survey	
		N = 720	N = 445	N = 229	N = 1,614	N = 719	N = 670	N = 1,528	N = 317
		Before		After				Before	After
Credit market indicators									
1	Credit/rates are #1 business problem	3%	2%	3%	3%	3%	4%	4%	3%
2	All borrowing needs met (net)	31%	33%	28%	30%	28%	25%	29%	29%
3	Loans "easier to get" (net)	-7%	-9%	-10%	-6%	-7%	-7%	-6%	-9%
4	Borrow regularly	35%	38%	34%	36%	32%	34%	35%	39%
5	Expect easier credit conditions (net)	-9%	-11%	-10%	-8%	-9%	-10%	-9%	-9%
Real economy indicators (not seasonally adjusted)									
6	Job creation plans (net)	9%	11%	7%	5%	4%	6%	10%	10%
7	Job openings	26%	31%	20%	23%	19%	20%	22%	21%
8	Capital spending plans	27%	31%	27%	27%	27%	30%	26%	24%
9	Good time to expand	12%	13%	11%	12%	10%	11%	8%	7%
10	Business conditions better in six months (net)	-8%	-3%	-8%	-9%	-15%	-9%	-13%	-19%
11	Expected change in real sales (net)	12%	12%	9%	1%	-11%	-12%	-6%	-13%
12	Plans to increase inventories (net)	-6%	-6%	-2%	-4%	-3%	-3%	1%	0%
13	Satisfaction with current inventories (net)	-2%	-3%	-2%	-7%	-3%	-4%	-6%	1%
Net positive responses (Rows 5 through 13)		61	75	52	40	19	29	33	22
Gain (Loss)		—	14	-23	-12	-21	10	4	-11
Net = % With a favorable response less the % with an unfavorable response									

significant change after the announcement, and the percent of owners expecting credit conditions to be better in future months improved by two percentage points.

On September 18, 2007, the Federal Reserve unexpectedly cut the Federal Funds target by 50 basis points (a 25-basis-point cut was expected by many market observers). As has previously been the case, the announcement had an adverse impact on plans to hire and make capital outlays and dimmed the expectations regarding future economic activity. Although there was virtually no evidence that credit conditions on “Main Street” were deteriorating, the bifurcated data make it clear that owner optimism (a composite of the questions asked) was improving significantly up to the time of the announcement. Although the media “noise” about the economy seemed to have little impact on owner optimism, the Federal Reserve announcement clearly carried a lot of weight. This convinced owners that they should pull back.

Table 5 illustrates two important findings. First, there was no “credit crunch” on Main Street as lines 1 through 5 show clearly. The net percent of owners reporting loans “easier to get” was basically unchanged from August through January (and the same as it has been for years), the best indicator of how tight monetary policy is. The percent of owners citing “finance” as their single most important business problem was also unchanged (the historical peak was 35 percent). Borrowing activity (an indicator of cash flow problems) did not change significantly (and at the same level for years) and owners did not expect financing to become more difficult in spite of Federal Reserve’s actions. There was no “spike” in credit tightness indicators that even closely paralleled the claims of “frozen” credit markets. Second, the Federal Reserve announcement produced a major pull-back on “real variables” such as the net percent planning to increase employment, the percent with job openings, and the percent planning capital expenditures. The net percent of owners expecting the economy to improve in six months declined with each Federal Reserve announcement as did the percent of owners viewing the current period as a good time to expand substantially. Real growth was 4.8 percent in the third quarter and fell to -0.2 percent in the fourth. It is likely that small business owners contributed to this dramatic slide.

The likelihood that the sudden change in business sentiment was a result of “seeing the same things the Fed saw at the same time” is very low, as

confirmed by the pattern of responses through the month of September. The *net* percent of owners expecting business conditions to be better in six months was 10 percent in the last 100 interviews received before the Federal Reserve announced a rate cut and fell to -15 percent in the last 100 questionnaires received in September, all in a period of 12 days. A similar pattern is observed for all of the Index components in Table 5. Owners did not suddenly have an “epiphany” and see a recession in the September data. The Federal Reserve provided for them credible evidence of a problem—the Federal Reserve warned and cut rates, and subsequent owner reactions were consistent with the dramatic decline in economic activity that occurred in the fourth quarter of 2007. It appears that every Federal Reserve announcement, whether intermeeting or at a scheduled meeting, produced negative responses from owners with respect to spending and hiring. The number of observations is too limited to determine if the response is different in magnitude depending on the degree of “surprise.” In recent times, “shocking” events came so quickly that it appeared there was no response of any consequence to the October 2008 intermeeting rate cut that was coordinated with other central banks.

4. Summary and Conclusions

The effect of monetary policy on the real economy (employment, capital spending, and so on) has long been a subject of intense interest to academics and policymakers. Basic economic theory posits a relationship between real investment spending and the level of nominal and real interest rates (linked by expected inflation). Capital spending is driven by a comparison of the rate of return expected on investments to market interest rates as a proxy for the cost of capital. However, the linkages between the financial and real sectors are complex and often opaque. Changes in interest rates affect asset values and investment decisions for economic agents; and this can have a more immediate impact, especially on financial institutions. And providers of capital often prefer to manage risk by refusing to make certain loans rather than trying to price the risk in the rate and fees charged (this type of rationing may not be related to the level of interest rates, however). Other explanations rely on stickiness and lags—decisions made before interest rates changes that must be adjusted after the change is made.

A more direct conduit to link policy changes to the real economy is described by the rational expectations model. Policy changes provide information signals which, taken together with other available information, are factored into forecasts of the future. These forecasts drive employment and spending decisions. Many small businesses rarely or never use debt to finance their operations and consequently are not likely to be impacted directly by changes in interest rates or credit rationing. Infrequent borrowers see their loans re-priced at long intervals, insulating them from current changes in interest rates or changes in lending standards. However, highly publicized changes in Federal Reserve policy are immediately known to small business owners, regardless of the amount of debt on their balance sheets, and carry information about the Federal Reserve's expectations. These expectations carry far more weight than the cacophony of views presented in the media and are incorporated into forecasts for the firm's future; and, based on these forecasts, decisions for hiring and spending are made. The evidence presented here makes it clear that Federal Reserve policy changes have an immediate impact on expectations about future business, and these forecasts are translated into spending and hiring plans, even for firms operating with no debt. These plans are then translated into actual changes in hiring and spending. At the macro level, small business hiring and spending plans are strongly correlated with macro measures of economic activity in subsequent periods (particularly with inflation and unemployment measures, top concerns of economic policymakers).

The evidence in this paper shows that:

- the response to changes in monetary policy can be quick, affecting expectations and plans immediately and actual spending and hiring within a few months;
- owners with no exposure to interest rates and borrowing costs respond in much the same way as businesses that rely on capital markets;
- actual changes in spending and hiring do occur in response to the changes in expectations and plans induced by policy action;
- many economic agents do not participate in the real adjustments (changes in hiring and spending), but enough do to matter;

- in the short run, Federal Reserve policy changes can be counter-productive, producing behavioral changes that reinforce the economic trends that the Federal Reserve is trying to fight (slower economic activity or inflation).

With increased emphasis on communication and transparency, how the Federal Reserve delivers its message will become a more important determinant of the immediate response of the economy to policy changes.

REFERENCES

- Berger, Allen N., and Gregory F. Udell. 1998. "The Economics of Small Business Finance: The Role of Private Equity and Debt Markets in the Financial Growth Cycle." *Journal of Banking and Finance*, 22: 613–73.
- Bernanke, Ben, and Mark Gertler. 1995. "Inside the Black Box: The Credit Channel of the Monetary Policy Transmission." *Journal of Economic Perspectives*, 9(4): 27–48.
- _____, and Alan S. Blinder. 1992. "The Federal Funds Rate and the Channels of Monetary Transmission." *American Economic Review*, 82(4): 901–21.
- Christiano, Lawrence, Martin Eichenbaum, and Charles Evans. 1997. "Sticky Price and Limited Participation Models: A Comparison." *European Economic Review*, 41(6): 1201–49.
- Dunkelberg, William, and A. Cooper. 1983. "A Cross-Section Study of Small Business Financing," in *Frontiers of Entrepreneurship Research*, edited by John A. Hornaday, Jeffrey A. Timmons and Karl H. Vesper. Babson College, 369–81.
- _____, Jonathan Scott, and William Dennis. October, 2003. *Small Business Indicators of Macroeconomic Activity*. National Federation of Independent Business.
- Juks, Reimo. 2004. *Monetary Policy Transmission Mechanisms: A Theoretical and Empirical Overview*. Central Bank of Estonia.
- Scott, Jonathan, William Dunkelberg, and William Dennis. 2003. *Credit, Banks and Small Business—The New Century*. NFIB Education Foundation.
- Sims, Christopher, and Tao Zha. 2006. "Does Monetary Policy Generate Recessions." *Macroeconomic Dynamics*, 10(2): 231–72.
- Taylor, John B. 1995. "The Monetary Transmission Mechanism: An Empirical Framework." *Journal of Economic Perspectives*, 9(4): 11–26.