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Synergies between Bank Supervision and Monetary Policy
Implications for the Design of Bank Regulatory Structure

Joe Peek, Eric S. Rosengren, and Geoffrey M. B. Tootell

The current structure of bank supervision in the United States has evolved through regulatory competition whereby banks would choose the regulator that most suited their operations. As a result, bank supervision responsibility has not been closely tied to the institutional function of the supervisor. In this study, we focus on determining which institutions the Federal Reserve should supervise based on one of its institutional functions: The Federal Reserve should regulate those banks that provide the greatest synergies between bank supervision and the conduct of monetary policy.[1] We build on recent research by Peek, Rosengren, and Tootell (1999a,b) that finds that confidential supervisory information can improve the conduct of monetary policy. Although that research has established the potential synergies between bank supervision and monetary policy, the implications of these synergies for regulatory structure have not been examined. If regulatory structure were based on the criterion of which institutions provided the most useful supervisory information for monetary policy, a very

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1. Among the other Federal Reserve functions, other relevant criteria for determining the set of banks to be supervised by the Federal Reserve might be lender of last resort and managing the payments system, in which case the emphasis might be on large institutions that pose the greatest concern for systemic risk. In fact, many of the proposals to restructure bank supervision have given supervisory authority over the largest bank holding companies to the Federal Reserve.

different set of institutions would be selected than if the criterion were based solely on the institutions that posed the greatest systemic risk.

A number of plans to reform the bank supervisory and regulatory structure have been proposed over the past fifty years. Although these proposals differ in varying degrees from the current structure (and from each other), a comparison makes clear that any legislation to alter bank supervisory responsibilities will likely focus on one or more of the following three dimensions: charter type, whether a bank is included in a holding company, and the size of the banking organization. The debate has focused on these three dimensions more for political than for economic reasons. This paper contributes to this debate by focusing on an important economic consideration that has been largely absent from prior discussions about redesigning the bank regulatory structure. We examine recent proposals focusing on the extent to which the proposals are likely to assign to the Federal Reserve regulatory oversight of the set of banks that provides the most useful information for improving macroeconomic forecasts relevant for monetary policy.

As a benchmark, we review the empirical evidence found in Peek, Rosengren, and Tootell (1999a) on the extent to which supervisory information about the set of all banks improves forecasts of inflation and unemployment rates. The percent of bank assets held by those banks that supervisors deem to be the most troubled is the measure of the information acquired through bank supervisory responsibilities that is used in these tests. Next, we investigate the extent to which supervisory information about the set of banks currently regulated by the Federal Reserve provides useful information for the conduct of monetary policy. Because the holding company status of a bank is one of the primary dimensions considered in many regulatory reform proposals, we consider the set of banks for which the Federal Reserve serves as primary federal regulator as well as the broader set of banks included through the Federal Reserve's bank holding company (BHC) supervisory responsibilities.

We then analyze four alternative regulatory structures that have been proposed recently to determine their potential impact on the conduct of monetary policy. The first such reform proposal maintains BHC supervisory responsibilities for the Federal Reserve but eliminates the primary regulator responsibility over state member banks. The second proposal limits Federal Reserve supervisory responsibility to only the twenty largest holding companies (along the lines of the 1994 Treasury proposal) plus state-chartered member banks. The third proposal considered assigns the Federal Reserve regulatory responsibility over all state-chartered banks (along the lines of the 1994 Federal Reserve proposal). This structure ignores the holding company affiliation of the banks. The fourth proposal differs only slightly from the third by taking into account holding company affiliation. Here, the Federal Reserve is assigned regulatory responsibility

over all banks in any BHC that has a state-chartered lead bank, plus any state-chartered bank not in a holding company.[2]

Section 8.1 provides some background on bank supervisory structure and potential synergies between supervisory information and the conduct of monetary policy. Section 8.2 provides the methodology. Section 8.3 investigates whether informational synergies vary across sets of banks associated with alternative regulatory structure proposals. Section 8.4 discusses the transferability of supervisory data among regulators. The final section provides some conclusions and policy implications.

8.1 Background

The bank regulatory structure in the United States has evolved into an unusually intricate interlocking web of supervisory responsibilities. Individual banks choose their chartering authority, and in so doing also choose their bank supervisor. If a bank chooses a national charter, it is regulated by the Office of the Comptroller of the Currency (OCC), a part of the U.S. Treasury Department. The OCC regulates many of the largest banks, with responsibility for over one-quarter of all banks, by number, that account for more than half of all bank assets.

The Federal Deposit Insurance Corporation (FDIC) is an independent federal agency. In addition to its responsibility for providing deposit insurance, it has supervisory responsibility for all state-chartered banks that are not members of the Federal Reserve System. The FDIC has responsibility for approximately 60 percent of all banks, but they account for only about one-fifth of all bank assets because of their small average size.

The Federal Reserve has responsibility for supervising all state-chartered banks that are members of the Federal Reserve System. The Federal Reserve is the primary federal regulator for approximately 10 percent of all banks, accounting for less than one-quarter of all bank assets. However, in addition to its responsibility as the primary regulator of all state member banks, the Federal Reserve also has supervisory authority over BHCs. Because most banks are in BHCs, the combination of responsibilities for BHCs and as the primary regulator for state-chartered member banks assigns the Federal Reserve supervisory responsibilities for over three-quarters of banks, representing more than 90 percent of bank assets, including most large entities.

The BHC supervisory responsibility gives the Federal Reserve access to

2. In other countries, changes in regulatory structure have been even more extreme, frequently removing the central bank from bank supervisory responsibilities and providing a single financial services regulator for banks, insurance companies, securities firms, and mutual funds. Countries adopting a single regulator model include the United Kingdom, Korea, and Japan. Numerous other countries are considering moving to such a model.

virtually every large bank. Even though they are not the primary regulator of many of the biggest banks, they nonetheless are actively involved in joint examinations of lead banks and the holding companies. In fact, it is required that the examination for the holding company and the lead bank be coordinated under certain conditions related to the size or the health of the BHC. Those conditions include the holding company having over $10 billion in assets and the holding company or lead bank having one of the two lowest supervisory rating categories (four or five), or, if their condition has deteriorated, having a rating of three (BHC Supervision Manual; available at http://www.federalreserve.gov/boarddocs/supmanual/default.htm_bhcsm). In addition, although the exams are expected to be concurrent, they are expected also to include the "performance of certain on-site examination activities by examiners from the agencies on a simultaneous or coordinated basis so as to enhance cooperation" (BHC Supervision Manual). Although in practice the degree of coordination and cooperation will vary by regional reserve bank and the associated OCC or FDIC regional office, the interagency policy statement on 10 June 1993 made clear that the agencies were expected to strengthen coordination and cooperation. Thus, the Federal Reserve is required to have hands-on supervision of any large or troubled bank in a holding company.

An additional layer of regulatory oversight is present for state-chartered banks. Although each state has supervisory powers over the banks it has chartered, the bank must also follow the regulations of its federal regulator. Thus, the state regulatory agency has overlapping supervisory responsibilities with the bank's primary federal regulator, either the Federal Reserve (state member banks) or the FDIC (nonmember banks). In addition, the Federal Reserve has supervisory responsibility for all BHCs. In the extreme, a state-chartered nonmember bank in a holding company would come under the jurisdiction of three different regulators: the state banking supervisor, the FDIC, and the Federal Reserve.

It is debatable whether such a convoluted regulatory structure would be the structure of choice if one were to organize supervisory responsibilities from scratch. A number of proposals to reform bank supervision and regulation have been suggested over the past fifty years, and one motivation underlying these proposals has been to reduce regulatory overlap. Although the proposals vary, and none has resulted in a major restructuring, the assignment of banks to particular regulators in these proposals has been based primarily on three considerations: bank charter, bank size, and whether the bank is in a BHC.

Basing regulatory authority on charter type would be assigning regulators based primarily on historical precedent, because such a split would not allocate banks to regulators by size of institution, potential to cause systemic risk, or importance to monetary policy or the payments system. Prior to 1864, all banks were state chartered, with the exception of the

experiment with the First and Second Banks of the United States. Banks were able to issue bank notes partially backed by the banks' gold and silver reserves. However, this haphazard system led to the distribution of a plethora of bank notes and an incentive for banks that got into trouble to issue more notes than they could redeem. With the large outstanding government debt from financing the Civil War, it was decided to establish a national currency secured by government bonds and to charter national banks that could issue bank notes secured by government debt. The OCC was established in 1864 to charter, supervise, and examine all national banks. After the establishment of the Federal Reserve in 1913, the Fed had the authority to supervise member banks, which included all national banks. Thus, supervisory responsibility over national banks was shared initially by the Fed and the OCC, although that was changed in 1917 because of turf battles. The result was the elimination of this regulatory overlap. The OCC examined national banks, but provided information to the Federal Reserve. The Federal Reserve was given primary regulatory responsibility for state-chartered banks that were members of the Federal Reserve System.

The choice between a state or national charter has been left to individual banks, rather than being tied to achieving particular public policy objectives, such as improving information for the conduct of monetary policy or reducing systemic concerns. Thus, a bank's choice is determined by which charter the bank believes most enhances its profitability. Charter preferences have been influenced by numerous factors, including taxes on bank notes, a regulator's willingness to allow extended powers, the direct and indirect costs of bank examinations, and the regulatory authority's regulatory and supervisory stance.

Assigning regulatory responsibilities to the Federal Reserve according to bank size may be related to other central bank responsibilities. Most of the largest financial institutions have substantial interlocking relationships and are often integral to the functioning of the financial markets in which they specialize. Thus, the central bank's responsibilities for the discount window function, for management of the payments system, and for maintaining orderly financial markets and a stable economy would provide an economic rationale for assigning the central bank supervisory responsibilities for the largest banks. However, large bank size and potential systemic risks are not synonymous, insofar as some smaller banks are important niche players in some markets and, as the failure of Penn Square Bank showed, even relatively small banks can have a significant impact on their larger brethren.

Assigning regulatory responsibilities according to BHC status has both economic and historical precedents. Although BHCs were first formed in the early 1900s, it was only in the mid-1900s, as holding companies were formed to avoid interstate and intrastate branching restrictions, that hold-

ing companies became more popular. In 1956 the Bank Holding Company Act gave the Federal Reserve supervisory authority over multibank holding companies, and in 1970 this supervisory authority was extended to single-bank holding companies. Thus, although a bank's choice of a holding company structure is driven by self-interest and is determined primarily by legal considerations (e.g., for tax purposes and to circumvent restrictions on forming banking networks and on nontraditional bank activities), choosing a holding company structure that allows Federal Reserve oversight may have some potential economic benefits in a broader public policy context. Because the largest institutions are in holding companies, Federal Reserve supervisory responsibilities over these institutions can provide synergies for the central bank's responsibilities as lender of last resort, managing the payments system, and conducting monetary policy.

Most discussions about restructuring bank supervision have focused on reducing regulatory overlap. However, proposals intended only to reduce regulatory overlap provide no guidance for evaluating the costs or benefits of alternative proposals that have one regulator per institution but that are based on a number of other factors, including charter type, bank size, or holding company affiliation. In part, this absence of a persuasive rationale for restructuring bank supervision, other than satisfying the goal of reducing regulatory overlap, has prevented the adoption of a politically palatable restructuring proposal.

As far back as 1949, President Truman created a task force to examine bank supervision. The task force recommended that all federal bank supervision be combined, preferably in the Federal Reserve. A similar conclusion was drawn by a private study in 1961 by the Commission on Money and Credit, which recommended that the supervisory responsibilities of the OCC and the FDIC be transferred to the Federal Reserve. Two other reports also recommended a single federal regulator, although outside the Federal Reserve System. A study commissioned by the House Banking Committee in 1975 recommended that a single Federal Depository Institutions Commission supervise all banks, thrifts, and credit unions. The Grace Commission reported in 1983 to President Reagan that a single regulator, the Federal Banking Commission, should be given supervisory responsibility for banks currently regulated by the OCC, the FDIC, and the Fed. Although the Hunt Commission in 1971 expanded the proposed number of federal regulators to two (an Administrator of National Banks and an Administrator of State Banks), the Federal Reserve still played no role as a primary supervisor.

In 1984, Vice President Bush provided a blueprint for reform that placed all national banks and BHCs whose lead bank was a national bank under a Federal Banking Administration, while placing all state-chartered banks and BHCs whose lead bank was a state-chartered bank under Federal Reserve supervision. This proposal eliminated the FDIC as a bank super-

visor and split supervisory authority according to bank charter. A Treasury study in 1991 recommended replacing the OCC and Office of Thrift Supervision (OTS) with a federal banking agency and placing all state-chartered banks under Federal Reserve supervision.

The most serious recent attempt to alter bank supervisory responsibilities occurred in 1994. The debate again focused on three major criteria for determining supervisory authority: charter type, holding company status, and size of banking organization. The Treasury proposal, which was generally incorporated into S.R. 1633 and H.R. 1214, recommended the creation of a single bank regulator with the supervisory responsibilities then assigned to the OTS, OCC, FDIC, and Federal Reserve. However, the Federal Reserve would still have shared supervisory responsibility over the twenty largest BHCs, including conducting exams and initiating enforcement actions. As an alternative, the Federal Reserve proposed that a Federal Banking Commission be created to supervise all national banks and thrifts, as well as all banks in holding companies with national banks as their lead bank. The Federal Reserve would regulate all state-chartered banks as well as all banks in a holding company with a state-chartered bank as its lead bank. At the BHC level, the Federal Reserve proposed two alternatives: placing them all under Federal Reserve supervision or distributing them according to the charter of the lead bank.

The numerous past proposals highlight that most legislation to alter bank supervisory responsibilities will likely focus on charter type, size of bank, whether a bank is included in a holding company, or some combination of these characteristics. Although numerous economic and political arguments for regulatory restructuring have been proposed, little empirical evidence has been provided on the possible costs or benefits of different regulatory designs. This paper examines recent proposals for redesigning the regulatory structure focusing on the extent to which the proposals are likely to assign to the Federal Reserve regulatory oversight over the set of banks that provides the most useful information for improving macroeconomic forecasts relevant for monetary policy.

Such evidence is particularly relevant given that a number of countries have recently adopted a regulatory structure with a single financial services regulator outside of the central bank. Although the blurring of geographic and product characteristics of financial institutions has encouraged many countries to adopt a single regulator model (United Kingdom, Japan, Korea), the costs to systemic stability, lender of last resort responsibilities, or synergies with monetary policy have not been quantified. Although reducing regulatory overlap and inconsistent regulations may be an important objective, it is important also to understand if possible synergies with other central bank functions might be impaired. In fact, a frequent response to regulatory reform measures has been that the Federal Reserve needs hands-on experience with banks to fulfill its responsibilities

properly, including the conduct of monetary policy. If such hands-on experience does affect the quality of information, then one important concern when deciding who the Federal Reserve should regulate would be whether the institutions supervised by the Federal Reserve provide the most useful information synergies with the Fed's monetary policy responsibilities.

8.2 Methodology

Previous work by Peek, Rosengren, and Tootell (1999a,b) has found that confidential supervisory information substantially reduces the forecast errors made by private forecasters who do not have access to this information. However, they did not examine whether the usefulness of supervisory information varied across the three dimensions focused on here: bank charter, size of banking organization, and BHC affiliation. If the value of bank supervisory data for macroeconomic forecasts varies by type of institution regulated, then the choice of regulatory structure may impact the information the Fed has available to conduct monetary policy.

Testing the hypothesis that the information content of bank supervisory data could vary across groups of banks requires examining the effect on private forecast errors of a variable that serves as a proxy for those supervisory data. The basic equation takes the form

$$X_{t+i} = \alpha_0 + \alpha_1 E_{t,j}(X_{t+i}: I_{t,j}) + \alpha_2 Z_t + \varepsilon_t,$$

where X_{t+i} is the realized future value in period $t + i$ of the macroeconomic variable being forecast; $E_{t,j}(X_{t+i}: I_{t,j})$ is the expectation of that variable by forecaster j at time t conditioned on publicly available information at time t when the forecast is made; and Z_t is a proxy variable for the confidential supervisory data available to bank supervisors at time t. Z_t is constructed using alternative subsets of banks corresponding to regulatory reform proposals. One can then use differences in the equation standard errors across equations that differ by including Z_ts calculated for alternative sets of banks to identify the set of banks that provides the Fed with the greatest synergies between bank supervision and the conduct of monetary policy.

This study examines the one-, two-, three-, and four-quarter-ahead forecast errors of inflation and unemployment rates of the Federal Reserve's own internal forecasts (the Greenbook) and three major commercial forecasters: Data Resources, Inc.–McGraw Hill (DRI), Georgia State University (GSU), and the University of Michigan Research Seminar in Quantitative Economics (RSQE). All three private forecasters sell their forecasts commercially and have generally been among those with the best forecast record for the macroeconomic variables examined in this study (McNees 1992).

Both RSQE and GSU provide quarterly forecasts that generally are re-

leased in the middle month of each quarter. The Federal Reserve Greenbook forecasts are at Federal Open Market Committee meeting frequency, which ensures at least one forecast per quarter. When a quarter contains more than one Greenbook forecast, we use the one closest to the middle of the quarter. DRI provides forecasts monthly, and we use its forecast for the middle month of each quarter so that all forecasters possess roughly the same information set. The sample period begins in 1978:Q1, because the CAMEL data first became available only in late 1977, and ends in 1996:Q2. However, the GSU forecasts begin only in 1980:Q3.

The measure of confidential supervisory information that we use is based on the CAMEL ratings used by bank examiners to rate individual banks. The CAMEL scores given to banks are based on the five categories supervisors analyze when evaluating the health of a bank: Capital, Assets, Management, Earnings, and Liquidity.[3] Each bank is rated from 1, the highest, to 5, the lowest, on each of the component categories and is given a composite rating. Banks with a rating of 1 (sound in every respect) or 2 (fundamentally sound) are not likely to be constrained in any way by supervisory oversight. For banks with a 3 rating (flawed performance), examiners are likely to raise potential problems, but these problems are usually viewed as being correctable. Banks with a CAMEL rating of 4 (potential for failure, impaired viability) have a significant risk of failure. Banks with a CAMEL rating of 5 (high probability of failure, severely deficient performance) represent the set of banks with the most severe problems.

The variable that serves as a proxy for the confidential bank data available to the Federal Reserve is the assets of all commercial and savings banks with a CAMEL rating of 5 measured as a percentage of the total assets of all commercial and savings banks with supervisory ratings. We use the value for the end of the month prior to the forecast. The aggregate CAMEL5 measure was found by Peek, Rosengren, and Tootell (1999a) to improve the private-sector and Federal Reserve forecasts of inflation and unemployment rates substantially. If weakness in the banking sector, as indicated by a high percentage of banks with a CAMEL rating of 5, contains significant information about the economy not included in the available forecasts, the estimated coefficient on CAMEL5 should be positive in the unemployment rate equation and negative in the inflation rate equation. Weaker bank health, measured as a higher CAMEL5, would mean that private forecasters would overestimate the strength of the economy, and thus underpredict the unemployment rate and overpredict the rate of inflation.

We consider six alternatives for allocating supervisory responsibilities

3. On 1 January 1997 the CAMEL rating system was expanded to CAMELS. The *S* stands for "sensitivity to market risk" and is intended to measure how well prepared a bank is to handle changes in interest rates, exchange rates, and commodity or equity prices. The sample period for this study ends in 1996:Q2, however.

to the Federal Reserve. Supervisory information for the set of all banks (CAMEL5), as well as for three of the alternatives, serve as the benchmarks. The results for CAMEL5 can be considered as a comparison of two extreme proposals: entirely eliminating the Federal Reserve's role as a bank supervisor and assigning the Federal Reserve supervisory authority over all banks. The other three benchmarks are associated with the set of banks that the Federal Reserve currently supervises. FRS5 refers to the supervisory information about the set of state-chartered member banks for which the Federal Reserve serves as the primary federal regulator. BHC5 corresponds to the set of banks in BHCs for which the Federal Reserve currently has supervisory responsibilities. FED5 corresponds to the broader set of banks for which the Federal Reserve has supervisory responsibilities: banks in BHCs plus state-chartered member banks.

The other three alternatives correspond roughly with recent proposals for restructuring bank supervisory responsibilities. TOP20 + SMB corresponds to the set of banks in the twenty largest BHCs plus all state member banks. This roughly corresponds to a compromise between the 1994 Treasury proposal and the Federal Reserve's response to that proposal. STATE corresponds to the set of state-chartered banks as proposed by the 1991 Treasury study. STATE LEAD corresponds to the set of banks in BHCs that have a state-chartered bank as the lead bank, plus all state-chartered banks not in a holding company. This is consistent with the 1984 blueprint for reform proposed by Vice President Bush and the Federal Reserve response to the 1994 Treasury proposal.

8.3 Empirical Results

Table 8.1 presents the basic results for the aggregate CAMEL5 variable. This measure of confidential supervisory information makes a significant contribution to the reduction in forecast errors for both unemployment and inflation rates. The estimated effect is significant at all four horizons for the unemployment rate forecasts and at the three- and four-quarter-ahead horizons for the inflation rate.[4] The coefficients are both economically and statistically significant; for example, an increase in CAMEL5 of 1 percentage point, roughly 1 standard deviation, would account for an underestimation of the four-quarter-ahead unemployment rate of approximately .25 percentage points.

Table 8.2 contains the results for the unemployment rate when we use alternative subsets of banks for the calculation of the share of banks with a CAMEL rating of 5. Equations similar to those in table 8.1 are reestimated with the alternative supervisory information sets in two ways. First,

4. As discussed in detail in Peek, Rosengren, and Tootell (1999a), the standard errors are corrected using a method devised by Keane and Runkle (1990).

Table 8.1 **Base CAMEL5 Specification**

	Unemployment				Inflation			
Variable	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Constant	0.022	0.110	0.202	0.333	0.507	0.741	1.112	1.265
	(0.30)	(0.44)	(0.46)	(0.62)	(1.66)	(1.08)	(1.22)	(1.18)
Forecast	0.979***	0.948***	0.923***	0.900***	0.935***	0.929***	0.934***	0.892***
	(87.59)	(25.65)	(14.12)	(11.34)	(26.26)	(10.68)	(7.22)	(5.70)
CAMEL5	0.083***	0.165***	0.233**	0.255**	−0.220	−0.443	−0.882**	−0.959**
	(4.90)	(3.00)	(2.47)	(2.26)	(1.52)	(1.47)	(2.44)	(2.44)
No. of observations	286	286	286	286	286	286	286	286
$\overline{R}^2$	0.988	0.933	0.835	0.739	0.857	0.651	0.530	0.456
Log-likelihood	−157.421	−95.261	−225.352	−292.624	−474.479	−601.870	−639.704	−656.354

Notes: The standard errors in the forecast equation are corrected for the appropriate moving average error terms and for contemporaneous correlation across forecasters. Numbers in parentheses are absolute values of *t*-statistics.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

Table 8.2 **Alternative Specifications for Unemployment Rate Forecasts**

Specification	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
1. **FED5**	**0.122*** **	**0.090**	**0.195** **	**−0.155**	**0.272**	**−0.236**	**0.333**	**−0.054**
	(5.13)	**(1.38)**	**(2.39)**	**(0.76)**	**(1.93)**	**(0.69)**	**(1.96)**	**(0.13)**
CAMEL5		0.024		0.264		0.381		0.288
		(0.54)		(1.87)		(1.63)		(1.05)
2. **FRS5**	**1.645** **	**−0.042**	**1.276**	**−2.919**	**−0.611**	**−7.771**	**−4.374**	**−14.090*** **
	(2.22)	**(0.05)**	**(0.55)**	**(1.22)**	**(0.16)**	**(1.95)**	**(0.98)**	**(3.06)**
CAMEL5		0.084***		0.206***		0.345***		0.462***
		(4.17)		(3.24)		(3.23)		(3.78)
3. **BHC5**	**0.122*** **	**0.088**	**0.196** **	**−0.146**	**0.274**	**−0.216**	**0.336** **	**−0.030**
	(5.12)	**(1.37)**	**(2.39)**	**(0.73)**	**(1.94)**	**(0.64)**	**(1.98)**	**(0.08)**
CAMEL5		0.026		0.258		0.368		0.273
		(0.58)		(1.85)		(1.60)		(1.01)
4. **Top 20+SMB**	**0.070**	**−0.090**	**0.199**	**−0.093**	**0.316**	**−0.074**	**0.457**	**0.079**
	(1.17)	**(1.50)**	**(1.16)**	**(0.51)**	**(1.12)**	**(0.24)**	**(1.26)**	**(0.19)**
CAMEL5		0.099***		0.181***		0.245**		0.242
		(5.01)		(2.80)		(2.22)		(1.85)
5. **STATE**	**0.128*** **	**−0.076**	**0.297*** **	**0.072**	**0.387** **	**0.004**	**0.342**	**−0.310**
	(3.52)	**(1.08)**	**(2.70)**	**(0.33)**	**(2.09)**	**(0.01)**	**(1.58)**	**(0.72)**
CAMEL5		0.116***		0.133		0.231		0.399
		(3.29)		(1.21)		(1.23)		(1.71)
6. **STATE LEAD**	**0.133*** **	**−0.062**	**0.310*** **	**0.112**	**0.401** **	**0.047**	**0.357**	**−0.248**
	(3.60)	**(0.88)**	**(2.80)**	**(0.53)**	**(2.15)**	**(0.13)**	**(1.64)**	**(0.58)**
CAMEL5		0.110***		0.115		0.213		0.368
		(3.16)		(1.07)		(1.15)		(1.66)

Notes: The standard errors in the forecast equation are corrected for the appropriate moving average error terms and for contemporaneous correlation across forecasters. Numbers in parentheses are absolute values of *t*-statistics.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

we replace the aggregate CAMEL5 measure with the alternative proxy for bank health. For ease of comparison, we show only the coefficients for the relevant variables, and the rows containing the estimated coefficients for the alternative proxies are in bold face. Second, we include the alternative proxy as an additional explanatory variable in the basic equation that includes the aggregate CAMEL5 measure. The first specification can be used to determine if confidential supervisory information for a specific subset of banks can make a significant contribution to reducing forecast errors. The second specification addresses a different issue: whether the confidential supervisory information for the specific subset of banks differs from that contained in the aggregate CAMEL5 measure for the entire set of CAMEL-rated banks. We have calculated all shares using total assets in CAMEL-rated institutions as the denominator to compare the estimated coefficients more easily. However, the results are unaffected (other than the size of the estimated coefficients) when the denominator of the ratio is the sum of assets for the same subset of banks used for the calculation of the numerator.

The first two specifications shown in the table examine whether the confidential information about banks currently supervised by the Federal Reserve provides information that would improve the forecasts of the unemployment rate. The first proxy, FED5, is measured as the assets in institutions with CAMEL ratings of 5 that are supervised by the Federal Reserve, divided by total assets in all CAMEL-rated banks. This includes any bank that is in a holding company plus any other bank that has the Federal Reserve as its primary regulator (i.e., has a state charter and is a member of the Federal Reserve System). When FED5 replaces CAMEL5, the estimated coefficients are positive at each horizon and significant for the one- and two-quarter-ahead forecasts, and they just miss being significant at the 5 percent level for the other two horizons. Thus, the information about banks with a CAMEL rating of 5 that the Federal Reserve currently regulates can improve significantly on forecasts of the unemployment rate. The positive sign on the estimated coefficient indicates that as a larger share of Fed-supervised bank assets is accounted for by banks with a CAMEL rating of 5, the unemployment rate rises relative to forecasts, indicating that forecasters overpredict the strength of the economy. However, when both FED5 and CAMEL5 are included in the equation, neither has a significant estimated effect, likely due to the collinearity between the two measures.

The second specification of table 8.2 contains results for the bank health proxy (FRS5) constructed for the set of banks that have the Federal Reserve as their primary federal regulator. The results are weaker than those for FED5. When FRS5 is included without CAMEL5, the estimated coefficients have the predicted positive sign only for the one- and two-quarter-ahead forecasts, and the effect is significant only for the one-

quarter-ahead specification. When CAMEL5 is also included in the equation, its estimated effect remains significant. The estimated coefficient on FRS5 is negative at each horizon and significant at the four-quarter-ahead horizon. Thus, the supervisory information for state member banks appears to be much less useful for unemployment rate forecasts compared to that for the combination of banks in holding companies plus state member banks, indicating that the additional supervisory responsibilities over holding companies contribute information that can strengthen the Federal Reserve's ability to conduct monetary policy.

Although supervisory information for the set of banks the Federal Reserve does supervise (based on the current regulatory structure) provides some improvement over the information available to private forecasters that do not have access to confidential supervisory information, the Federal Reserve may not regulate the set of banks providing the information that can most improve the forecasts. The next four specifications shown in the table investigate the value of confidential supervisory information related to four alternative proposals for the set of banks to be supervised by the Federal Reserve. The third specification analyzes the proposal giving the Fed all banks in BHCs (BHC5). When BHC5 is included without CAMEL5, three of the four estimated coefficients are significant, with the fourth narrowly missing being significant at the 5 percent level. Given the extensive overlap with the set of all banks, it should not be surprising that when CAMEL5 is included, neither BCH5 nor CAMEL5 has an individual effect that is significant at any of the four horizons.

The fourth specification shows the results for the set of banks in the twenty largest holding companies plus all state member banks (TOP20+SMB). Interestingly, when the Federal Reserve retains supervisory responsibility over only the largest holding companies (plus state member banks), the value of supervisory information deteriorates substantially compared to that contained in BHC5. The estimated coefficient on TOP20+SMB is not significant for any horizon when CAMEL5 is omitted from the equation. Furthermore, when CAMEL5 is included in the equation, it has an estimated effect that is significant for the first three horizons. Thus, it appears that supervisory information about banks in holding companies other than the twenty largest contains information that is more useful for improving forecasts compared to that for the largest bank holding companies. This evidence suggests that the set of institutions that pose systemic risks may not substantially overlap with the set of banks for which supervisory information is most valuable for improving unemployment rate forecasts.

The next alternative measure of bank health considered is for the subset of banks consisting of all state-chartered banks (STATE) to determine the extent to which the information synergies between bank supervision and the conduct of monetary policy varies by bank charter type. When esti-

mated without CAMEL5, the coefficients on STATE are significant for the three shorter horizons, indicating that supervisory information about this subset of banks does contribute to the reduction in forecast errors for the unemployment rate. When CAMEL5 is included, its coefficient is significant for the one-quarter-ahead horizon and none of the STATE effects are significant.

The last alternative measure is a minor variation of STATE, with the subset of banks including any bank in a holding company with a state-chartered lead bank plus any state-chartered bank not in a holding company (STATE LEAD). The results are essentially the same as for the STATE specification. When CAMEL5 is excluded from the regression, STATE LEAD has a significant effect for the three shortest horizons. When CAMEL5 is included, STATE LEAD provides no useful information that differs from that contained in CAMEL5.

Table 8.3 contains the results for the inflation rate forecast equations corresponding to those reported in table 8.2 for the unemployment rate. When CAMEL5 is not included in the regression, the estimated coefficient on FED5 has the expected negative sign, but is never significant. When CAMEL5 is included, it has the predicted negative effect with all but that for the one-quarter-ahead horizon being significant. The estimated coefficient on FED5 becomes positive and, for three of the four horizons, is slightly larger than that for CAMEL5 (in absolute value), indicating a net effect for FED5 that is positive. In contrast, the estimated coefficients for FRS5 are not only negative, but are significant for the two- and three-quarter-ahead horizons. When CAMEL5 is included, it has the expected negative effect but is significant only at the four-quarter-ahead horizon. Furthermore, with CAMEL5 included, FRS5 retains its negative effect. Thus, for inflation forecasts, FRS5 appears to be relatively more informative than FED5, even though FED5 dominated FRS5 for unemployment rate forecasts.

Among the other four alternative subsets of banks considered, the BHC5 results are essentially the same as those for FED5, an unsurprising result given the extensive overlap across the two sets of banks. On the other hand, TOP20+SMB has estimated coefficients that are positive for three of the four horizons, although never significant. When CAMEL5 is included, it has estimated coefficients of the predicted negative sign that are significant for the three- and four-quarter-ahead horizons and is close to significance for the two other horizons. Unlike with BHC5 and FED5, however, no estimated effects of TOP20+SMB are significant when CAMEL5 is included in the regression.

The two specifications based on the subset of state-chartered banks appear to be the most informative for reducing the forecast errors for the inflation rate. For both STATE and STATE LEAD, the estimated coefficients always have the predicted negative sign, and they are significant for

Table 8.3 **Alternative Specifications for Inflation Rate Forecasts**

Specification	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
1. **FED5**	**−0.178**	**0.380**	**−0.142**	**1.536**	**−0.522**	**2.252****	**−0.550**	**2.477****
	(0.85)	**(0.91)**	**(0.32)**	**(1.87)**	**(0.94)**	**(2.33)**	**(0.94)**	**(2.27)**
CAMEL5		−0.448		−1.344**		−2.179***		−2.377***
		(1.56)		(2.38)		(3.33)		(3.20)
2. **FRS5**	**−10.129**	**−7.632**	**−25.371****	**−22.327**	**−28.860****	**−14.714**	**−22.111**	**−3.232**
	(1.77)	**(1.14)**	**(2.25)**	**(1.74)**	**(2.08)**	**(0.92)**	**(1.49)**	**(0.19)**
CAMEL5		−0.124		−0.154		−0.681		−0.916**
		(0.74)		(0.45)		(1.62)		(2.03)
3. **BHC5**	**−0.175**	**0.382**	**−0.134**	**1.534**	**−0.512**	**2.235****	**−0.545**	**2.441****
	(0.84)	**(0.92)**	**(0.31)**	**(1.88)**	**(0.93)**	**(2.33)**	**(0.93)**	**(2.26)**
CAMEL5		−0.448		−1.340**		−2.164***		−2.351***
		(1.57)		(2.39)		(3.33)		(3.19)
4. **Top 20+SMB**	**0.002**	**0.396**	**0.476**	**1.345**	**0.072**	**1.590**	**−0.338**	**1.201**
	(0.00)	**(0.82)**	**(0.58)**	**(1.45)**	**(0.07)**	**(1.46)**	**(0.34)**	**(1.08)**
CAMEL5		−0.284		−0.652		−1.121***		−1.140**
		(1.73)		(1.96)		(2.82)		(2.59)
5. **STATE**	**−0.487**	**−0.523**	**−1.241****	**−1.990****	**−2.040*****	**−2.644****	**−2.175*****	**−2.720****
	(1.87)	**(1.07)**	**(2.39)**	**(2.13)**	**(3.44)**	**(2.42)**	**(3.24)**	**(2.26)**
CAMEL5		0.023		0.504		0.409		0.371
		(0.09)		(0.96)		(0.66)		(0.54)
6. **STATE LEAD**	**−0.490**	**−0.515**	**−1.244****	**−1.914****	**−2.055*****	**−2.604****	**−2.198*****	**−2.703****
	(1.87)	**(1.08)**	**(2.38)**	**(2.08)**	**(3.45)**	**(2.43)**	**(3.26)**	**(2.29)**
CAMEL5		0.017		0.455		0.374		0.346
		(0.06)		(0.88)		(0.62)		(0.52)

Notes: The standard errors in the forecast equation are corrected for the appropriate moving average error terms and for contemporaneous correlation across forecasters. Numbers in parentheses are absolute values of *t*-statistics.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

all but the one-quarter-ahead horizon, with or without the inclusion of CAMEL5. In fact, when CAMEL5 is included, its effect is never significant. Thus, it appears that for inflation rate forecasts, the confidential supervisory information about state-chartered banks contains most of the useful information contained in the aggregate CAMEL5 measure.

Table 8.4 provides a comparison of the equation standard errors across the alternative specifications for the set of Federal Reserve Greenbook forecasts. The errors for this forecast alone are used because the loss to monetary policy is being examined. In each instance, the equation standard errors are measured as a percentage of that for the specification that excludes confidential supervisory information (BASE). Each regression contains a constant term, the forecast, and the indicated CAMEL rating measure for a particular set of banks. A value equal to or greater than unity indicates that the confidential information contained in the particular measure of bank health does not improve upon the standard forecasts that do not rely on confidential supervisory information.

The aggregate CAMEL5 measure reduces the equation standard errors for the Greenbook forecasts by 5 to 9 percent in the unemployment rate equations and by 1 to 4 percent in the inflation rate equations. Although the supervisory information about the set of banks the Federal Reserve currently supervises (FED5) improves the unemployment rate forecasts, the contribution is less than that achieved by CAMEL5, except for the one-quarter-ahead horizon. On the other hand, for inflation rate forecasts, the supervisory information contained in FED5 contributes to a reduction in forecast errors only for the one-quarter-ahead horizon. Further limiting the information to that about the set of banks for which the Federal Reserve is the primary federal regulator (FRS5) essentially eliminates any reduction in forecast errors for the unemployment rate. The reduction in the standard error compared to the BASE specification is less than 0.5 percent for the one- and four-quarter-ahead horizons, with no improvement for the other two horizons. For the inflation forecasts, this measure reduces the standard error by less than 3 percent for the two-quarter-ahead forecast and by less than 2 percent for the one- and three-quarter-ahead forecasts, with no improvement for the four-quarter-ahead forecast. Thus, supervisory knowledge about the institutions that have the Fed as their primary regulator provides little useful information that could improve forecasts of the inflation and unemployment rates.

One of the contentious issues in rearranging supervisory responsibility is whether the Federal Reserve should continue to supervise BHCs. When the supervisory information set is limited to that about banks in BHCs, the improvement in the equation standard error for the unemployment rate ranges from 3 to 4 percent, except for the 9 percent improvement for the one-quarter-ahead horizon. Thus, the improvement at the one-quarter-ahead horizon is roughly the same as for the aggregate CAMEL5 measure,

Table 8.4 **Standard Errors of Alternative Specifications for Greenbook Forecasts, Measured Relative to Forecast without CAMEL Information**

	Unemployment				Inflation			
Variable	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
BASE	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CAMEL5	0.9105	0.9287	0.9227	0.9432	0.9670	0.9888	0.9661	0.9584
FED5	0.9078	0.9671	0.9624	0.9694	0.9906	1.0057	1.0000	1.0007
FRS5	0.9953	1.0063	1.0066	0.9958	0.9833	0.9734	0.9845	1.0009
BHC5	0.9078	0.9674	0.9622	0.9689	0.9910	1.0058	1.0001	1.0009
Top 20+SMB	0.9898	0.9926	0.9909	0.9893	1.0037	1.0033	1.0070	1.0050
STATE	0.9519	0.9224	0.9280	0.9588	0.9563	0.9653	0.9372	0.9234
STATE LEAD	0.9492	0.9186	0.9253	0.9568	0.9561	0.9655	0.9372	0.9230

Note: The calculations are based on standard errors for equations in which the actual value is regressed on a constant, the forecast value, and the variable listed in the "Variable" column.

and substantially less for the other three horizons. For the inflation rate, BHC5 provides a 1 percent reduction in the equation standard error at the one-quarter-ahead horizon and no improvement at the other three horizons.

It is possible that the information content in BHC5 is all coming from the larger institutions. If so, the set of institutions that pose systemic risks would overlap with those institutions that provided confidential supervisory information useful for forecasting inflation and unemployment. However, when supervisory information about only the top twenty holding companies plus state member banks is used, the equation standard errors for the unemployment rate are reduced by only about 1 percent at each horizon, and there is no improvement at any horizon for the inflation rate forecasts.

The two measures based on supervisory information about state-chartered banks tend to dominate all of the other alternatives. Thus, if information synergies were the criteria, splitting supervisory responsibility by charter type rather than by whether the bank is in a holding company would be preferred. For the unemployment rate, they produce the largest reduction in the equation standard error at the two-, three-, and four-quarter-ahead horizons among all the alternatives, and even outperform the aggregate CAMEL5 measure at the two-quarter-ahead horizon. However, at the one-quarter-ahead horizon, both FED5 and BHC5, as well as CAMEL5, produce larger reductions in the equation standard error. On the other hand, for the inflation rate equations, STATE and STATE LEAD produce equation standard errors that are smaller than those for any of the other alternatives, as well as for aggregate CAMEL5.

8.4 Transferability of Supervisory Information

If supervisory information could be comprehensively transferred without loss of information, the Federal Reserve would not need to be directly involved in supervising banks. Any synergies with monetary policy, or for that matter with the discount window or the payments system, could be exploited using regular, timely reports on bank condition provided to the Federal Reserve by the primary bank regulators. However, in practice this is likely to result in some loss of information.

First, highly confidential information is not easily shared across bureaucracies. In fact, even within a bureaucracy, it is often difficult to share confidential information. As Peek, Rosengren, and Tootell (1999a) discuss, economists at the Federal Reserve engaged in economic forecasting generally do not have access to confidential bank supervisory information. Thus, even within an organization, it can be difficult for the right individuals to gain access to useful supervisory information.

Second, supervisory information is useful to the Federal Reserve only if

the Fed understands how the rating is formulated and how the rating process may be changing over time. Furthermore, the Fed needs to know whether there are other variables or supervisory practices that may impact the quality or interpretation of the information provided by other bank supervisors. Peek, Rosengren, and Tootell (1999a) show that supervisory ratings may vary across size of institution, and Berger, Kyle, and Scalise (chap. 9, this volume) provide evidence that ratings vary over time. Thus, hands-on experience in bank supervision enables the Federal Reserve to identify nuances in the bank supervisory process, as well as in bank health.

Third, other bank supervisors may have objective functions that differ from those of the central bank. Whereas a bank supervisor may be focused on factors affecting the probability of an individual bank failing, the central bank may be more concerned with systemic risks. Thus, collecting data on concentration of exposures, how these exposures vary across the banking system, and how they may impact other financial institutions may be of greater interest to the central bank. This becomes particularly important when requests for detailed information on bank portfolios are viewed as a regulatory burden to the banks and when evaluating that information may be costly in terms of bank examiner resources. Similarly, the central bank may be more interested in data that improve its ability to forecast the macroeconomy and that may be less directly relevant for pure safety and soundness considerations at the individual bank level. Thus, the availability of supervisory information that has synergies with monetary policy and the discount window function may require some direct involvement in the supervisory process by the central bank.

8.5 Conclusion

Recent research by Peek, Rosengren, and Tootell (1999a,b) has established that confidential supervisory information can be used to improve the conduct of monetary policy. This paper explores the implications of these findings for the structure of bank regulation. We find that supervisory information from Federal Reserve–regulated banks does improve macroeconomic forecasts of inflation and unemployment rates. However, the greatest information synergies with monetary policy are from state-chartered banks. Thus, regulatory proposals that would focus regulatory powers of the Federal Reserve only on BHCs or on large, internationally active banks may sacrifice some information useful for monetary policy.

Loss of regulatory powers would imply a loss of synergies with monetary policy only if the information were no longer easily transmitted to policy makers. Peek, Rosengren, and Tootell (1999a) and Berger, Kyle, and Scalise (chap. 9, this volume) provide some evidence that hands-on experience with institutions may be necessary. Central to the Federal Reserve's proposals for regulatory reform is that the Federal Reserve maintains hands-

on experience. As Chairman Alan Greenspan testified, "Without the hands-on experience of regulation and supervision, and the exposure to the operations of banks and markets provided by such experience, the Federal Reserve's essential knowledge base would atrophy" (Greenspan 1994, 88). If synergies to monetary policy were part of this essential knowledge base, any proposal for regulatory structure reform would need to include the smaller banks that have provided the greatest improvement for forecasts of inflation and unemployment rates.

Of course, a variety of other factors should be important for determining optimal bank regulatory structure. Concerns with providing lender-of-last-resort functions, potential concerns with systemic risk, potential cost savings, and concerns with the regulatory burden on financial services firms, as well as many other issues, should also shape the debate on optimal regulatory structure. However, this research indicates that there is potentially a cost to monetary policy if the central bank is excluded from participation in bank regulation in general, or even if central bank oversight is limited only to the largest institutions.

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Comment

Ben S. Bernanke

This interesting paper is motivated by an important, broader issue: namely, whether central banks should be involved in bank supervision as well as in monetary policy. The issue is of practical relevance, as several countries

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around the world have recently either eliminated or diluted the authority of their central banks over the bank supervisory process.

In a number of recent papers, Peek, Rosengren, and Tootell have raised a novel argument for a continued role for central banks in bank supervision. Their argument is that confidential supervisory reports provide information that is potentially valuable for forecasting key macroeconomic variables, so that access to this information may help improve the conduct of monetary policy. Specifically, they have provided empirical evidence for the United States that a relatively simple measure of banking system health—the share of banking assets held by poorly rated banks (i.e., those with a CAMEL rating of 5)—improves forecasts of inflation and unemployment at one, two, three, and four quarters, relative to projections made by private forecasting concerns and by the Fed itself. Further—and this is the main contribution of the present paper—the greatest forecasting value appears to lie in information about the condition of state-chartered banks.

These findings are intriguing and worthy of further exploration. In particular, the result that the most useful information comes from supervision of state-chartered banks—which tend to be small and not publicly traded—makes a good deal of sense. Having said that, I am not yet convinced that this line of argument is of first-order importance in the debate about the Fed's appropriate role in bank supervision. In the remainder of this comment I explain why (for now at least) I would prefer not to rely on the authors' argument as an important pillar of the case for Fed involvement in bank supervision. I then take the opportunity to discuss briefly the broader issue of what the Fed's role should be.

My reservations about the authors' argument, at least as it stands at the present juncture, are as follows:

First, I think that regulatory design ought to be based on durable, well-established facts and principles, of which the long and varied history of central banking has provided many. Although the PRT regressions are suggestive, they are of necessity somewhat contingent, being based on limited information and a limited sample. Obviously, future studies might produce different results. To illustrate my concern, suppose for the sake of argument that, based on these findings, we were to give the Fed responsibility for supervising state-chartered banks. Then suppose that a future set of regressions were to show that the most valuable information comes from (say) national banks, or, alternatively, that there is no longer marginal forecasting value in supervisory information. Would we then be prepared to change the regulatory design? This is not really a criticism of Peek, Rosengren, and Tootell, who deserve much credit for opening this line of research. My point is only that, as long as the authors' claims remain better described as intriguing hypotheses rather than robust facts, we should be cautious about using these results for regulatory design.

Second, it has not yet been shown that the use of confidential supervisory information would lead (or has led) to an economically significant improvement in monetary policy outcomes. In particular, it would be useful to know more about the marginal value of supervisory information for forecasting, as the force of the authors' argument depends very much on the conclusion that this information is potentially highly useful for the Fed. It is striking that the Fed currently does not seem to make systematic use of this information in its official Greenbook forecasts—though, as the authors have pointed out in other works, confidential supervisory information does seem to affect the votes of Federal Open Market Committee members in a more informal way. The main evidence on forecast improvement given in the paper is in table 8.4, which shows standard errors for regressions with and without the CAMEL5 measure. However, these have the defect of being in-sample comparisons. Out-of-sample forecasting comparisons would be a useful extension, as would some additional analysis of the forecast errors. For example, is the marginal forecasting power of supervisory information (if it survives in an out-of-sample comparison) concentrated in certain subperiods or certain geographical regions?

Third, the authors acknowledge that their argument depends very much on the assumption that information cannot be effectively transferred between agencies, so that unless the Fed itself is the supervisor of banks it will not have full access to the information relevant to making monetary policy. Unfortunately, this assumption is by its very nature extremely difficult to test. The CAMEL5 variable, which Peek, Rosengren, and Tootell show contains useful information for forecasting, could itself be easily transferred from a supervisory agency to the Fed, as could even more detailed quantitative information about bank condition. Thus the authors' ultimate claim is quite indirect: They must argue that if CAMEL5 contains information, surely less quantifiable information in bank supervision must exist as well. They give a number of anecdotal examples of imperfect transfers of information between bureaucracies, and conference participants added more—all of which seem plausible. Nevertheless, it appears that a leap of faith on this issue is unavoidable. Personally, I think the information transfer argument is much stronger in the context of crisis management, when highly detailed and complex information must be transferred quickly. I return to this point later.

To reiterate, my reservations about using the authors' argument to support a particular policy conclusion do not detract from my admiration for their research on this topic. The information content of bank supervisory reports bears on a variety of issues in macroeconomics and finance and is certainly worth studying. I hope the authors will continue to expand and refine their results in this area.

I turn now, briefly, to the broader issue, of whether the Fed should have

a role in bank supervision. The standard argument for involving the central bank in supervision is that monetary policy and banking policy are, inevitably, closely intertwined and complementary. For example, as was emphasized by Bagehot and probably earlier authors, both the economy as a whole and the banking system in particular are strongly affected by the central bank's interest rate settings. Moreover, the sensitivity of the economy to interest rate changes may be affected by the condition of the banking system (recall the "headwinds" of the early 1990s), and vice versa. Good interest rate policies therefore require that the central bank take account of both the state of the economy and the state of the banking system, as well as their interactions. Taking account of the banking system in turn requires intimate knowledge of the condition of banks, which can only be acquired (or so it is claimed) by the central bank's participation in the supervisory process. A similar argument applies to discount-window policy, which affects the money supply (indeed, in the early days of central banking, discount-window lending was the only way to affect the money supply) but is also the principal instrument for fulfilling the lender-of-last-resort function for the banking system.

However, although we are accustomed to seeing the Fed and other central banks play a supervisory role, there are certainly some considerations on the other side. One important issue is supervisory efficiency. The current system, with three supervisors and overlapping jurisdictions, imposes significant costs on both the government and the banks. As the financial system grows larger and more complex, perhaps the most rational solution would be to have a single, specialist regulatory and supervisory agency that is responsible for the system as a whole, or at least for the entire banking system. By avoiding overlap and supervisory fragmentation, by being cognizant of the interconnections among financial institutions and markets, and by developing a high level of supervisory expertise, such an agency (it could be argued) would both improve the quality of supervision and reduce its social costs. Of course, the Fed is a candidate to take on this "superregulatory" role; but one might respond that giving this portfolio to the Fed would both invest too much power in one institution and also distract the Fed from its primary mission of making monetary policy.

Another argument against a bank supervisory role for the Fed is the potential for moral hazard. To the extent that the Fed has institutional objectives other than maximizing social welfare, giving the central bank too broad a range of powers may invite abuse. For example, if the Fed were anxious to conceal the insolvency of some part of the banking system (an impulse that we have seen at times in other supervisory agencies), it might be tempted to distort interest rate policies in a way that increases bank profits or asset values, at the expense of macroeconomic objectives. Conversely, it is also possible that the Fed might use its supervisory au-

thority to pressure banks into making loans that they otherwise would not make, in order to serve some goal such as providing short-term macroeconomic stimulus or helping bail out a country suffering a financial crisis. (Not to say that these are necessarily bad objectives; again, a problem only arises when the Fed's institutional priorities differ from those of the society at large.) At the conference, Charles Calomiris gave a number of possible examples of such behavior. The temptation to distort supervisory policies to serve monetary policy objectives, or vice versa, arises of course from the same complementarities between monetary policy and banking policy stressed earlier. I think the potential for moral hazard is real and should be a concern for those who supervise the supervisors. The risk of moral hazard, by the way, is yet another reason for maximum transparency in central banking.

So what's the bottom line? After thinking about both sides of the issue, and giving due credit to the arguments for regulatory efficiency and moral hazard, my own provisional conclusion is that the Fed should retain its supervisory powers, and that its supervision should focus on the largest and most complex banking firms. The key desideratum, I believe, is the need to have a competent and highly trusted public institution that is empowered to deal effectively and in a timely way with financial crises. The Fed has certainly established its credibility and competence over a period of time. Furthermore, because interest rates and discount-window lending are important instruments for dealing with financial crises, and because crises often have major implications for the economy as a whole, the central bank is the natural agency to serve as command central when the financial system threatens to melt down. To fulfill this role effectively, the Fed needs detailed information about not only the general financial condition of the banking system but also about complex financial linkages and the associated vulnerabilities—and it needs to be able to get this information within hours or even minutes. A role for the Fed in the supervisory process is the most direct way to ensure that the necessary information is available in a crisis.

I would not necessarily rule out future modifications of the regulatory design that preserve Fed access to supervisory information. Indeed, it may be possible to rationalize the system in a way that reduces the regulatory costs imposed on banks without affecting the information flow (a system of jointly conducted examinations under a uniform set of regulations might be worth considering, for example). The Fed should also work as closely as possible with other regulators, including nonbank regulators such as the SEC, to improve its information channels. However, because financial crises are dangerous, unpredictable, and not well understood, we should be extremely cautious about changing a system for dealing with such crises that has served us well for half a century.

Discussion Summary

Frederic Mishkin began by asking which kinds of information a lender of last resort could get if there were no bank examinations. He followed up by asking about what happens to information flows, especially if the central bank is responsible for managing financial crises.

Patricia Jackson noted that there could be real information issues when central banks no longer carry out supervision of banks. She observed that with in-house information one gets information about interlinkages that might be important in identifying systemic problems. She noted that the Bank of England had carried out work to look at the size of exposures between different players in various markets. Central banks needed to consider the likely sources of shocks and the adequacy of capital buffers. Focusing on the recent experience in the United Kingdom, she said that one should not overemphasize the trend toward the separation of supervision and central banking. She noted that England is the only country in the G7 where the monetary authority is not involved at all in prudential supervision or linked to the prudential supervisor. For the United Kingdom it meant that the supervisor and central bank needed to work closely together and share information. Lastly, about the results in the paper, Jackson observed that the lags in economic data are substantial. The Bank of England has regional representatives to gather more immediate information on the economy at a regional level. Maybe it is this type of information that the CAMEL ratings pick up.

Stephen Cecchetti suggested that the authors look out of sample and at other data to see if market information, for example, might be a good predictor. He also noted that the conflict of interest argument might be overstated. He pointed out that a financial system collapse would also be bad for macroeconomic stability. Discount loans are 100 percent collateralized, although there are a few extreme exceptions. Finally, he noted that it might be useful to separate regulation, supervision, and consumer protection.

Mark Carey noted that crisis intervention is a key role of the monetary authority and that this is often done through the banks. He emphasized that the monetary authority needs a credible threat because banks will want others to bear the responsibility. He observed that central bank independence gets supervisors' independence. He concluded by noting that it is also desirable to have multiple supervisors to filter out bad ideas.

Laurence Meyer began by noting that the paper tries to rationalize a Byzantine structure. He noted that it is important for the agencies to cooperate to limit regulatory burden on the banks. He observed that regulatory competition may be good in any areas, but the downside to competition is the potential for a race to the bottom. He agreed with Ben Bernanke, the discussant, that supervisors should be structured to max-

imize supervision; systematic risk will be key, so it is important for the Federal Reserve to have a good relationship with the OCC. Picking up on other comments, he argued that the recapitalization of the banking system was not a conflict of interest but was complementary. Finally, he asked whether one wants a supervisory authority with no macroeconomic responsibility.

Randy Kroszner observed that if the rationalization for having the monetary authority and bank supervisor under one roof is the role of the Federal Reserve as crisis manager, then we should not stop at banking. He noted that the key is to have coordination.

Andrew Powell observed that the information from the tequila crisis was that information flows were the key, although he noted that Venezuela was a counterexample. He followed up on earlier remarks and pointed out that regulation and supervision could be separate. He observed that this separation might enable policy to break down some resistance from supervisors. He concluded by noting that in the end financial regulation should be independent.

James Wilcox noted that the question of many supervisory agencies is a little different from where supervision is housed, but he wondered whether competition and separation were inefficient. He noted that multiple supervisors might not give consistent answers, as evidenced by the Berger, Kyle, and Scalise paper. He also wondered how well information travels. He noted that the Treasury and the Federal Reserve have been able to coordinate their activities during currency-related crises. Finally, he noted that, given the new rules from the Gramm-Leach-Bliley Act, as insurance and security companies come into the new financial holding companies, the Federal Reserve will need to rely more heavily on insurance regulators and the SEC.

Robert Eisenbeis asked a number of questions about the authors' data and results. First, he asked over what time horizon the forecasts were compared. He suggested that the relevant forecast horizon might be longer than one quarter. Second, he asked about the data vintage: Were the authors using the final or revised data? He also asked how much the addition of the regulatory information improved the precision of the forecasts. Finally, referring back to comments from Ben Bernanke, he noted that the mix of goals is complex. He observed that it is not always true that internalizing the resolution of conflict is good, because goals may have different primacy.

Charles Calomiris noted that the race to the bottom for regulatory competition might be avoided. He argued that regulators might be too risk averse and that they may resist beneficial deregulation in the absence of regulatory competition. He noted that in the United States deregulation was partly a product of such competition. With respect to political pressure, he noted that there are a number of cases from recent history in

which supervisors either apparently bow to political pressure or get banks on board. One example he pointed to is the link between bank merger and Community Reinvestment Act policy.

Allen Berger concluded the comments by noting that, as the authors acknowledge, a crucial aspect of the argument is that there must be more information from the exam process than just the CAMEL rating to justify the combination of supervision and central banking. He pointed out that a bank exam goes beyond balance sheet information. He observed that communication from bankers may be key, as was the case in the credit crunch where bankers recognized the difficulties first.

Eric Rosengren began by responding to a number of the technical and data suggestions. He noted that they did look at public information such as call report information and interest rate spreads and that their results did not change significantly. He observed that this is further evidence that private information matters for forecasting. He also noted that they had split the sample. He pointed out that looking at the performance of the model out of sample would be difficult given the recent experience of few poor CAMEL ratings. He noted that the authors were in the process of developing a panel data set of GDP forecasts, but that this can be challenging given the revisions to the data. He also noted that they had looked at forecasts from one to four quarters ahead. Finally, he observed that the authors' *Quarterly Journal of Economics* paper discusses both the statistical and economic significance of the findings.