Switching primary federal regulators: Is it beneficial for U.S. banks?

Richard J. Rosen

Introduction and summary

In the United States, commercial banks can select among three primary federal regulators. A bank chooses a chartering agency and decides whether it will be a Federal Reserve System (Fed) member, thereby selecting its regulatory authority. A nationally chartered bank is regulated by the Office of the Comptroller of the Currency (OCC). If it is a Fed member, a state-chartered bank has the Fed as its primary federal regulator; otherwise, it is overseen by the Federal Deposit Insurance Company (FDIC).[1] By choosing its charter and deciding whether to be a Fed member, a bank effectively selects its regulator.

This article explores how banks use their option to select a regulator. Specifically, I examine banks that switch from one regulator to another. Is the ability to switch regulators a positive aspect of our current system? I offer some insight into this issue by examining whether banks benefit from switching and how switching affects social welfare. This study helps shed light on the behavior of regulators and the efficacy of the current system of multiple regulators. There has been debate about whether regulators, when setting policies, act in the public interest or not. This article builds on Rosen (2003), where I focused on whether the regulatory competition was beneficial or destructive. Competition could spur useful innovation or regulatory flexibility, thereby allowing banks to benefit without reducing social welfare. It could also be a "race for the bottom"—or a "competition for laxity," to use former Federal Reserve Chairman Arthur Burns's term—if regulators try to attract banks by easing restrictions on unsafe or unsound practices. The evidence presented here is not consistent with a race for the bottom, while there is some evidence of beneficial competition. In general, a bank's return either stays the same or increases after it switches regulators, while its risk of failure does not rise.

While most banks never switch regulators, the aggregate number of switchers is not small. Over 10 percent of banks switched regulators at least once during the period 1977–2003. I compare banks that switch with others that do not in an attempt to learn why banks switch. I find that, prior to changing regulators, switchers have approximately the same return on assets as other banks, and switchers are somewhat riskier. Small banks are less likely than large banks to switch regulators, but this is largely due to the fact that small banks are less likely to be in a bank holding company. Nonlead banks that are in a holding company are more likely to switch than either lead (largest) banks in a holding company or banks not in a holding company.

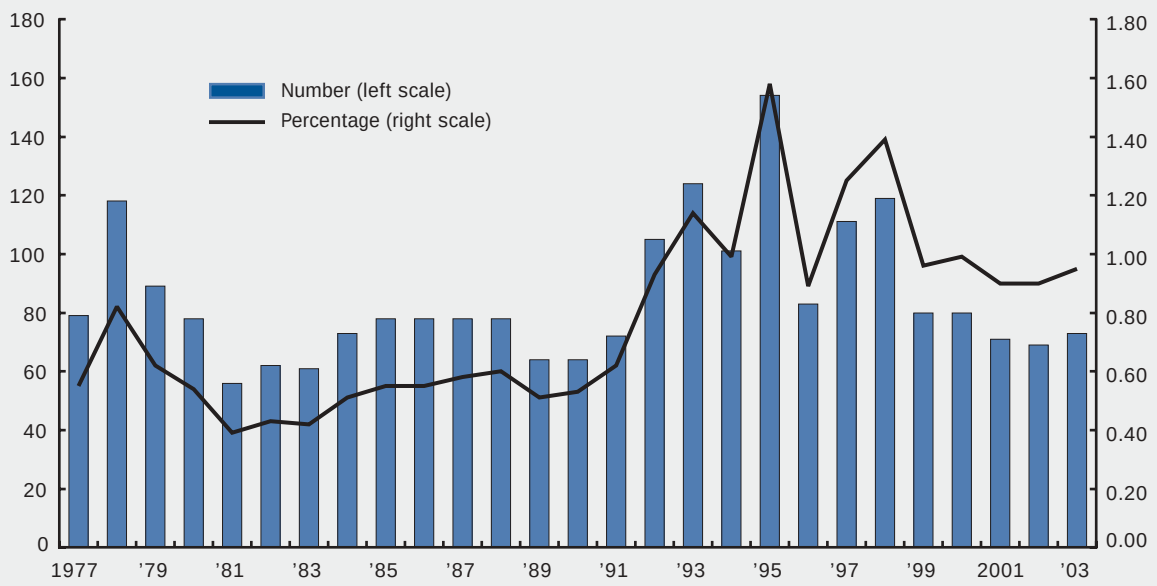
The effect of a switch on return and risk can indicate whether switches are beneficial. I find that banks generally increase their return when they switch regulators. There is little significant impact of a switch on risk. Banks tend to reduce their equity-to-asset ratio following a switch, but more inclusive measures of risk, such as the bank failure rate, point toward no increase in risk. An increase in return with no significant increase in risk is evidence consistent with beneficial competition. However, the aggregate results hide differences over the sample period in the performance of banks that switch.

The percentage of banks switching varies throughout my sample period—rising in the late 1970s, then falling to a lower rate in the 1980s, before rising again in the 1990s (see figure 1). There are many reasons why banks switch regulators, some of which may explain part of the pattern of switching over time. A switch

Richard J. Rosen is a senior economist and economic advisor at the Federal Reserve Bank of Chicago. *The author would like to thank Tara Rice, Craig Furfine, and the participants in a workshop at the Chicago Fed for their helpful comments.*

FIGURE 1

Banks that switch primary federal regulators, 1977–2003



Source: Data from Federal Deposit Insurance Corporation, 1977–2003, *Reports of Income and Condition*, Washington, DC.

may be prompted by changes in the structure of a banking organization, issues relating to the interaction between a banking organization and its regulators, or a shift in strategy sought by a banking organization. The sample period I explore—1977–2003—was one of major changes in banking, both in the structure of the industry and in the regulatory framework under which it operated. I explore whether the characteristics of banks that switch regulators vary over time, perhaps indicating changing motivations for switching. I find that prior to 1992, switching regulators has little impact on overall risk and return. However, switches in the latter part of the sample, specifically 1992–2003, have a significant impact on performance. Banks that switch in this period show an increase in return without a commensurate increase in risk, as would be expected if there is beneficial competition. Note that the post-1991 period is also when the rate of switching is at its highest.

The plan of the article is as follows. First, I provide an overview of when banks switch primary regulators. Next, I review the arguments for and against a system in which banks can choose among multiple regulators. Then, I examine the characteristics of banks that switch primary regulators and present an analysis of how switches affect performance, including failure probabilities.

The pattern of banks switching primary regulators

Banks have been switching primary regulatory agencies for many years (Scott, 1977, documents switches from 1950 to 1974). I examine switches that occurred from 1977 to 2003, a period that covers major changes in banking and bank regulation. I identify the year a bank changes primary regulators from the *Reports of Income and Condition* (call reports). Table 1 gives an overview of the banks that switched primary regulators. As table 1 shows, there were 2,298 switches during the sample period, an average of 85 per year. Over the sample period, 10.8 percent of banks left their respective regulators at least once (0.7 percent of banks switched more than once). Table 1 also provides a breakdown of switches based on the size of the bank. The smallest banks were the least likely to switch.

The pattern of banks switching regulators can be partially explained by regulatory changes. In 1980, the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) was passed. Prior to DIDMCA, there were important differences among regulators. For example, reserve requirements (the funds a bank must hold against specified deposit liabilities) depended on whether a bank was a member of the Federal Reserve System. DIDMCA leveled the playing field for all banks, regardless of membership in the Federal Reserve System. It is possible that many of the regulatory

TABLE 1

Banks that switch primary federal regulators, 1977–2003

Year	All switching banks		Total assets less than $1 billion		Total assets between $1 billion and $10 billion		Total assets greater than $10 billion	
	Number of banks	Percentage of banks	Number of banks	Percentage of banks	Number of banks	Percentage of banks	Number of banks	Percentage of banks
1977	79	0.55	79	0.55	0	0.00	0	0.00
1978	118	0.82	118	0.83	0	0.00	0	0.00
1979	89	0.62	89	0.63	0	0.00	0	0.00
1980	78	0.54	75	0.53	2	1.15	1	5.56
1981	56	0.39	55	0.39	1	0.54	0	0.00
1982	62	0.43	57	0.40	5	2.38	0	0.00
1983	61	0.42	58	0.41	3	1.29	0	0.00
1984	73	0.51	70	0.50	3	1.18	0	0.00
1985	78	0.55	77	0.55	1	0.35	0	0.00
1986	78	0.55	72	0.52	6	1.97	0	0.00
1987	78	0.58	76	0.58	2	0.63	0	0.00
1988	78	0.60	77	0.61	1	0.31	0	0.00
1989	64	0.51	61	0.50	3	0.97	0	0.00
1990	64	0.53	61	0.52	2	0.66	1	2.22
1991	72	0.62	68	0.60	4	1.37	0	0.00
1992	105	0.93	90	0.82	14	4.33	1	1.96
1993	124	1.14	111	1.06	12	3.74	1	1.82
1994	101	0.99	96	0.97	4	1.35	1	1.75
1995	154	1.58	140	1.50	12	3.88	2	2.90
1996	83	0.89	78	0.87	3	1.03	2	2.99
1997	111	1.25	101	1.18	10	3.79	0	0.00
1998	119	1.39	115	1.40	4	1.42	0	0.00
1999	80	0.96	76	0.95	4	1.46	0	0.00
2000	80	0.99	70	0.90	9	3.32	1	1.43
2001	71	0.90	62	0.82	7	2.50	2	3.03
2002	69	0.90	63	0.86	6	2.11	0	0.00
2003	73	0.95	63	0.87	8	2.46	2	2.63
Total	2,298	0.73	2,158	0.70	126	1.76	14	1.18

Note: Size classes are based on total assets in 2003 dollars.
Source: Data from Federal Deposit Insurance Corporation, 1977–2003, *Reports of Income and Condition,* Washington, DC.

switches that occurred prior to and immediately after passage of DIDMCA were related to the changes instituted by the act rather than any actions of the regulators.

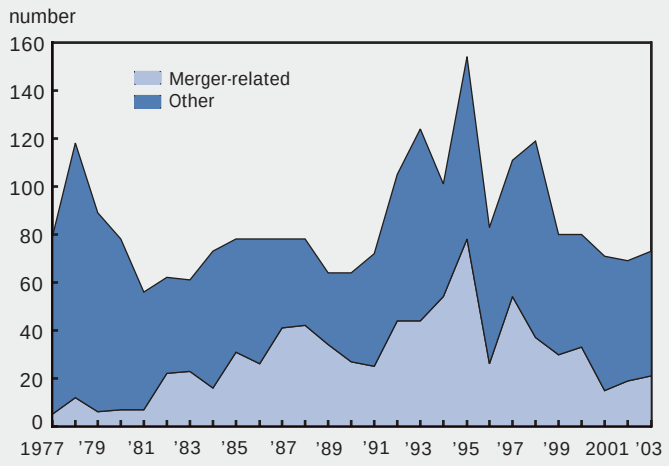
During the 1980s, states gradually reduced their restrictions on interstate and intrastate expansion (Amel, 1991; Amel and Starr-McCluer, 2002). This may have prompted the merger wave in the 1980s and could have led to some of the switches of primary regulators during that decade. In addition, the Riegle–Neal Act of 1994 removed the restrictions on interstate branching. This act was phased in over the next few years as states gradually adopted its provisions (Dick, 2006).

Merger activity, and switches associated with mergers, varied significantly over the sample period. Figure 2 gives the number of merger-related and other switches by year. I define a bank as having switched because of a merger if it switches its primary regulator in the year of its merger or the following year. If banks with different primary regulators merge, the newly formed bank will have to choose one of the two regulators. Following a merger, if the acquiring bank changes from its pre-merger regulator to the target bank's regulator, then I record this as a switch of primary regulators for the newly formed bank. A total of 779 banks switched regulators following a merger, one-third of all switches.

In the main analysis of the article that follows, I do not include banks that have recently merged. An objective of this article is to examine whether the ability of banks to switch regulators is a valuable option. This is difficult to do with switches following mergers for at least two reasons. The first is that, as noted above, banks with different primary regulators are forced to choose one. This leads to a different—and likely, lower—threshold for switching regulators than for nonmerging banks. It is possible that the inclusion of

FIGURE 2

Merger-related and other switches



Source: Data from Federal Deposit Insurance Corporation, 1977–2003, *Reports of Income and Condition*, Washington, DC.

banks that switch regulators concurrent with a merger will bias the results toward finding no impact from switching. The second reason for dropping merger-related switches is perhaps more important. A merger can significantly affect the reported return and risk for a bank. Costs related to the integration of the merging banks can depress the return for several years. Also, the decision to participate in a merger may be related to return and risk. Banks may be more likely to be merger targets when their return has been declining or when their risk has been increasing. This may bias the before-and-after comparison of return and risk for banks that merge.

Bank mergers affect not just the merging banks, but also other banks. The bank merger waves in the 1980s and the 1990s increased the average size of a bank dramatically. However, these waves had a much smaller effect on local market competition, with the average market concentration index essentially unchanged. These changes affected competition in local markets (see, for example, Berger, Udell, and Rosen, 2005). Some switches of regulators may have been partially in response to these repercussions of bank consolidation. These switches are included in the sample, since they do not suffer from the drawbacks noted in the previous paragraph.

DIDMCA and the merger waves may have induced some of the changes in my sample period. However, there are many switches that cannot be explained purely by regulatory changes or industry consolidation. In the next section, I examine additional possible explanations for switches of primary regulators.

Are multiple regulators beneficial?

There has been a debate over the best regulatory structure for a long time (see Rosen, 2003, for some examples). This section briefly explores why banks switch regulators and discusses some concerns about the current regulatory system, as well as some of its benefits.

When bank managers are asked why they change primary regulators, they generally respond in one of three ways. These managers claim that a bank switches because it can gain additional powers (as Chase Manhattan Bank did when it changed the primary regulator of its Delaware bank in 1990); save on regulatory compliance costs (as Chase Manhattan Bank did after its merger with Chemical Bank in 1995); or expand more easily nationwide (as HSBC USA did when it changed its charter in 2004). Broadly speaking, regulation at the three agencies—the OCC, the Fed, and the FDIC—and among the states (for state-chartered banks) is similar.[2] But for some banks, the differences among regulators might be important enough to induce a switch. During part of the sample period, for example, the insurance powers granted to banks varied among regulators. To conduct certain insurance activities, a bank might have needed to switch regulators. Thus, Chase Manhattan switched the regulator of its Delaware bank to allow it to sell insurance.

Some switches might be prompted because of the costs of regulation, which are both indirect and direct. The indirect costs include managerial and legal costs involved in meeting with bank examiners and making required reports. Indirect costs also involve the opportunity costs of restrictions on portfolio choices imposed on banks by regulators, such as reserve requirements and expedited funds availability.[3] There is no reason to believe that there are systematic differences in the indirect costs that banks would face at the different agencies. However, there are differences in direct costs. Both the OCC and the FDIC charge for bank exams, but the Fed does not. This may seem to give the Fed a cost advantage, but examination of state-chartered banks is shared with state regulators, who charge for their exams. Still, there can be cost differences among regulators. This may induce some switches if the OCC, the FDIC, or some states change the cost of exams (or if, because of competition in banking, a bank feels it has to squeeze out additional

cost savings). Cost considerations may have also prompted some holding companies to simplify their regulatory structures.

From a social perspective, some question whether having multiple regulators is a good idea. There are several potential drawbacks to the current regulatory system. At minimum, having multiple regulators introduces complications. For instance, when J. P. Morgan Chase merged with Bank One in 2004, J. P. Morgan Chase Bank had a state charter and Bank One had a national charter. As part of the merger process, J. P. Morgan Chase had to decide which charter to adopt (and if it chose a state charter, whether to become a Fed member). This took time and resources that would not have been necessary if there were only a single bank regulator. Moreover, when it selected a national charter, the bank's former state regulator had to shift its personnel and pricing to account for the loss of a major bank. These costs may not be large, but they are certainly present.[4]

A potentially more serious issue is that regulators might not always act in the social interest. Stigler (1971) points out that regulators can be captured by the firms they cover because those inside a particular industry care a lot more about the regulators' decisions than outsiders do. As a result, they may choose policies that benefit banks rather than the public.

Related to this concern, the literature on regulatory structure explores a "race for the bottom" among regulatory agencies. In the 1970s, then-Fed Chairman Arthur Burns commented that he feared destructive competition among regulators for banks (their customers, in a sense). He brought up the possibility of what he called a "competition for laxity," a scenario in which banks would relax regulation to capture market share (see Scott, 1977). Since the budget of an agency depends in part on the number and size of the firms it regulates, regulators might compete against each other by offering lenient treatment in order to attract firms. When Chase Manhattan Bank elected to have a state rather than a national charter, subsequent to its merger with Chemical Bank in 1995, the OCC lost fees amounting to 2 percent of its budget. Similarly, when its successor, J. P. Morgan Chase Bank, returned to a national charter after its merger with Bank One in 2004, the New York Banking Department (the state regulatory agency) lost 27 percent of its revenues. If either agency was concerned with maximizing its budget, it would have an incentive to remove burdens on banks to keep them from switching.[5]

A race for the bottom could allow banks to manipulate the system. That is, banks might choose their primary federal regulator (and potentially, their state of incorporation, and thereby, their state regulator) to take actions that benefit the bank but are not in the public interest. An example of this would be a bank that switched regulators in order to adopt a new, risky strategy (or to hide risks it was already taking). The risk could increase the exposure of the deposit insurance fund. It is important to note that a bank can only switch to a new regulator if that regulator approves. Thus, regulators have the ability to block switches of this kind.

On the other hand, having multiple regulators offers potential benefits. A single regulator might have less incentive to allow banks to undertake new powers or to use new products. There is a natural tendency for regulators to be risk averse, since they are assigned blame for anything that goes wrong, but may not be recognized for permitting beneficial changes. Potentially beneficial changes that one regulator views as too risky might be adopted by another regulator. In addition, having multiple regulators allows for some specialization. Tiebout (1956) presents a model of public goods provision by local communities that has often been modified to examine other regulatory issues. The Tiebout framework can be used to show that under certain conditions (including when there are no externalities and there is costless mobility), regulatory competition leads to optimal standards setting. Different localities can offer distinct menus of public goods, with each individual choosing the menu best suited for that individual (referred to as Tiebout sorting). This model underlies the arguments for local control of securities regulation (Romano, 1998), antitrust enforcement (Easterbrook and Fischel, 1991), and environmental policy (Revesz, 2000). These papers also claim that the benefits of competition among local agencies eliminate (or should eliminate) a race for the bottom.

Connected to Tiebout sorting, another reason that banks might switch is that regulatory enforcement may differ among agencies. There may be an explicit policy shift at a particular agency. For example, in 1991, Federal Reserve Chairman Alan Greenspan was worried that examiners were contributing to a "credit crunch" by requiring banks to hold too much capital against loans. This was interpreted by some as a signal for examiners to relax enforcement. This could have encouraged banks to switch to the Fed from the other agencies.[6]

An additional complication to this analysis is that a bank regulatory agency is essentially a collection of examiners. Unlike regulators in many other areas, examiners in banking frequently make subjective decisions about the banks they visit.[7] Berger, Kyle, and Scalise (2000) review examiner and regulatory agency discretion when monitoring banks. Examiners go

into a bank to evaluate its risk. Based on this assessment, the examiners decide whether the bank's reserve for loan losses is sufficient, and then they assign a strength rating—the CAMELS (capital, asset quality, management, earnings, liquidity, and sensitivity) rating—to the bank. If a bank wants to change its portfolio, its examiners must decide how to react. The examiners can either accede to the change or make it costly for the bank by requesting a higher loan loss reserve (resulting in a charge against income) or by giving the bank a lower CAMELS rating (resulting in greater regulatory costs for the bank). Thus, to an extent, examiners can decide how costly it is for a bank to add risk. Having multiple regulators and the ability to switch among them allows the bank to escape examiners that the bank feels are out of line.

One potential problem that a bank might have is that its examiners can exploit the discretion they have when assessing the bank to serve their own ends. Some examiners may be interested in leading a "quiet life" (Rosen, 2003).[8] That is, they may want to get by with as little work and as little career risk as possible. To get a quiet life, some examiners might prefer to regulate banks with portfolios that are as simple as possible to evaluate.

There is another reason why examiners may put up roadblocks to change by banks. Regulatory behavior may be influenced by a desire to avoid criticism from groups other than the firms that examiners assess. Importantly, Congress and public interest groups may criticize ex post actions that were proper ex ante (as Kane, 1989, argues they did early in the savings and loan crisis in the 1980s). This gives regulatory agencies and, by extension, examiners an incentive to avoid actions that could increase the risk of bank failure. Fear of criticism may induce risk aversion on the part of examiners who want a quiet life.

Whether having the ability to switch regulators leads to beneficial competition or a race for the bottom can be tested by examining which banks switch and how switching affects the performance of these banks. The key here is to decide which switches are "beneficial" and which are not. A beneficial switch allows a bank to move to a better risk–return trade-off without increasing societal risk. I used the risk of bank failure as a proxy for societal risk. Banks are overseen by government agencies for many reasons. For instance, banks are regulated in order to maintain a smoothly operating payments system and to confirm that their deposits are insured. Both of these objectives imply that regulators want to limit excessive risk-taking by banks, which should limit bank failures. A race for the bottom might work this way: Regulators could allow banks that switch to increase societal risk without a compensatory increase in return. Bank managers or shareholders could profit from this, but only by taking advantage of the deposit insurance system. Beneficial competition among regulators, on the other hand, would allow banks to move to a better risk–return trade-off without increasing failure probabilities.[9] Note that these tests are sufficient to indicate beneficial competition or a race for the bottom, but there are other factors that may not be figured in. Beneficial competition can help all banks, not just those that switch. I cannot directly test for this, but the increase in bank profits and decrease in bank failures over the past 15 years are consistent with beneficial competition—and not a race for the bottom. Still, since these trends are also a function of macroeconomic factors, this is at best weak evidence.

Characteristics of banks that switch regulators

To evaluate banks that switch regulators, I need measures of return and risk. Return is easy to measure. I use the return on assets (*ROA*), but its results are similar to other measures, such as the return on equity. Unfortunately, there is no simple inclusive measure of risk. I use direct and indirect risk evaluations. The direct measure of risk I use is a failure prediction model. As noted above, bank failures can reduce the smooth operating of the payments system and increase losses to the deposit insurance fund. Thus, if a regulator allows banks that switch to take actions that increase their failure probabilities, this suggests a race for the bottom. To attain a second estimate of failure probability and to determine how risk changes relative to return, I use four accounting ratios that capture different aspects of risk. The most direct is the Sharpe ratio, which is the ratio of ROA to the standard deviation of the ROA (again, the results are similar to the return on equity). To construct this measure for year *t*, I use the ROA for year *t* as the numerator. The denominator is the standard deviation of the semiannual ROA (expressed as an annual return) for all the periods from year $t - 4$ to year *t* for which return data exists. I keep all observations with at least two years of return data as of year *t*. Even with ten semiannual periods, I do not have a very precise measure of risk. Still, while noisy, the ratio of ROA to its standard deviation does give a picture of the risk–return trade-off.

I also use other accounting measures of risk traditionally used to evaluate banks. The equity-to-asset ratio (*EQUITY/ASSET*) is a measure of leverage, with higher values indicating lower risk, since equity

TABLE 2

Performance of banks prior to switching regulators

	Banks that switch			Banks that never switch			
	Mean	Median	Standard deviation	Mean	Median	Standard deviation	Test of difference of means (p value)
ROA	0.93	1.00	0.65	0.93	1.03	0.78	0.842
SHARPE RATIO[a]	0.84	0.89	0.61	0.87	0.93	0.59	0.151
EQUITY/ASSET	8.69	8.11	2.54	9.18	8.59	2.80	0.000***
LOAN/ASSET	55.93	57.02	13.79	53.92	55.08	13.99	0.000***
CHRG/LOAN	0.43	0.19	0.87	0.56	0.22	1.70	0.000***
DEP/LIAB	95.50	98.13	7.98	96.58	98.42	6.14	0.000***
LOG ASSETS	7.88	7.85	0.51	7.77	7.73	0.48	0.000***
NONHC BANK	0.34	0	0.47	0.44	0	0.50	0.000***
LEADBANK HC	0.41	0	0.49	0.44	0	0.50	0.024**
NONLEAD SREG	0.10	0	0.30	0.07	0	0.26	0.003***
NONLEAD DREG	0.16	0	0.36	0.05	0	0.21	0.000***
OCC	0.43	0	0.49	0.30	0	0.46	0.000***
FED	0.16	0	0.36	0.07	0	0.26	0.000***
FDIC	0.42	0	0.49	0.63	1	0.48	0.000***
Observations		1,246			231,948		

[a]The Sharpe ratio only includes banks with at least two years of data.

**Significant at 5 percent level.

***Significant at 1 percent level.

Notes: Banks that switch regulators include all banks that switch regulators, except those that switch in the year of or year following a merger. Variable definitions are given in the text. The data are year-end (except for *ROA*, which is for the full year) for the period 1977–2003. Data for switchers are from the year prior to a switch. The variables *ROA*, *EQUITY/ASSET*, *LOAN/ASSET*, *CHRG/LOAN*, and *DEP/LIAB* are expressed as percentages. All other variables, except *LOG ASSETS*, are expressed as ratios.

Source: Data from Federal Deposit Insurance Corporation, 1977–2003, *Reports of Income and Condition,* Washington, DC.

offers a cushion against failure. The loan-to-asset ratio (*LOAN/ASSET*) is likely to be correlated with risk as well. Loans are among the riskiest assets on bank balance sheets. A bank with more loans, all else being equal, is more likely to fail. However, loans can vary significantly in risk. To measure the riskiness of a loan portfolio, I use the charge-off-to-loan ratio (*CHRG/LOAN*).[10] This ratio reflects expected losses on loans made in the past. A riskier loan portfolio, all else being equal, has higher charge-offs. Charge-offs can also reflect bad luck, poor management, or investments in risky but predictable loans (for example, some credit card loans). To capture risk differences on the liability side, I use the ratio of deposits to liabilities (*DEP/LIAB*). Deposits are a more stable source of funding than other liabilities, such as loans from other banks. Results based on these ratios should be viewed with caution, since they may be associated with changes in productivity as well as risk.

The loan-to-asset ratio and the charge-off-to-loan ratio can also be viewed as proxies for the workloads of bank examiners. Examiners have to spend more effort when reviewing loans than other assets, and they have to spend even more effort when reviewing nonperforming loans than other loans. If examiners desire a quiet life, they prefer banks to have nonloan assets, such as cash and government securities, and they are inclined toward banks that do not issue loans with a high probability of becoming nonperforming.

To assess whether a switch of primary federal regulators is beneficial, it is useful to know what leads a bank to switch regulators. To do this, I use a simple model to predict which banks will switch regulators as a function of the return and risk characteristics of the banks. The dependent variable, *SWITCH*, is a dummy that takes the value 1 in year *t* if a bank switches regulators in the year *t* + 1. The model is:

1) *SWITCH = f(ROA, SHARPE RATIO, EQUITY/ASSET, LOAN/ASSET, CHRG/LOAN, DEP/LIAB, control variables*).

When analyzing the data, I drop banks in any year that they are in the top or bottom 1 percent of *ROA*, *EQUITY/ASSET*, *LOAN/ASSET*, or *DEP/LIAB*.

To examine whether banks that switch regulators are different from other banks, it is important to control for reasons unrelated to return and risk that might lead a bank to shift its primary regulator. Table 1

shows that small banks are disproportionately less likely than larger banks to switch regulators. For this reason, I control for bank size using the log of total assets (*LOG ASSETS*). Structural considerations may play a role in the decision to switch. I control for holding company status, using dummies for whether the bank is the lead bank in a holding company (*LEADBANK HC*), or whether it is a non-lead bank within a holding company that has the same (*NONLEAD SREG*) or different (*NONLEAD DREG*) charter than the lead bank. Banks not in a holding company (*NONHC BANK*) compose the excluded category. This allows us to test for switches that reduce the number of regulators to which a holding company reports. There may also be other differences across primary regulators. To control for this, I include dummies for whether a bank is regulated by the Federal Reserve or the FDIC at the end of year $t - 1$ (the OCC is the excluded category). Finally, I include year dummies to control for systemic changes, such as changes in overall levels of return and risk in the industry as a whole.

Table 2 reports summary statistics for the return, risk, and control variables. Banks that switch regulators have a similar return and Sharpe ratio to other banks. There are differences between the two groups in the other risk measures. The equity-to-asset, loan-to-asset, and deposit-to-liability ratios all indicate higher risk for switchers than for other banks that have not switched, but switchers have a lower charge-off-to-loan ratio. However, I need to account for correlations among these variables and patterns in the proportion and type of banks that switch. I do this using a regression framework.

Equation 1 is estimated using a logistic regression. The results of the regression are reported in the first column of table 3. Consistent with the univariate statistics, the coefficient on *ROA* is not statistically significantly different from zero. So, I cannot use a bank's return to predict whether it will switch regulators. Most of the risk variables, on the other hand, are significant and can help predict which banks will switch. Banks with a lower Sharpe ratio, more leverage, and a lower deposit-to-liability ratio—all indicators of higher risk—are more likely to switch. Pointing to a trend in the other direction, banks with fewer charge-offs, signaling less risk, are also more likely to switch.[11]

As figure 1 and table 1 show, the proportion of banks that switch regulators varies over time. It is possible that the strength of banks varies along with switching intensity. To test this, I divide my sample period into two smaller periods. The early period includes all switches from 1977 to 1991. This covers the implementation of DIDMCA and the lesser wave of mergers in the 1980s.[12] The late period includes all switches from 1992 to 2003. This includes the peak of bank consolidation. This is also the time when the proportion of banks that switch regulators is largest.

The second and third columns of table 3 present regression results for the two smaller periods. There are differences across the two periods in the magnitude and statistical significance of the return and risk variables. For example, the coefficients on the Sharpe ratio and the charge-off-to-loan ratio are larger and statistically significant only in the late period. Still, the overall pattern is similar. Return is not a predictor of switching in either period, and banks that switch look somewhat riskier in every dimension except their level of charge-offs.

The control variables differ in important ways across the two periods. In the early period, 1977–91, small banks, all else being equal, are more likely to switch regulators. This is reversed in the late period, 1992–2003, when large banks are more likely to switch. Overall, banks that are not the lead bank in a holding company are more likely to switch than either lead banks or banks not in a holding company. Consistent with a desire to simplify the regulatory structure of their respective holding companies, non-lead banks that have different charters than their lead banks switch more often in both periods. Non-lead banks with the same regulator as their lead banks are only more likely to switch in the early period. This may reflect banks switching to exploit differences among regulators in the types of investments allowed, such as insurance activities. These differences tended to be larger in the early period than in the late period, especially once the Financial Modernization Act (also known as the Gramm–Leach–Bliley Act) was passed in 1999. The regulatory dummies also provide some interesting insights. Banks are more likely to switch from the Fed than either the OCC (the omitted regulator) or the FDIC in the early period. In the late period, however, banks under the Fed are less likely to switch than those under the OCC—and as likely as those under the FDIC. Over the entire period, banks under the FDIC are the least likely to switch.

The results suggest that banks that switch are different from those banks that do not. They also suggest that these differences depend on when the banks switch. These findings do not help determine whether there is a race for the bottom or beneficial competition, but they point out the importance of controlling for why and when banks switch, as well as other bank characteristics.

TABLE 3

Probability that bank will switch regulators in the next year

	Full sample	Early period (1977–91)	Late period (1992–2003)
ROA	0.020	0.031	–0.007
	(0.451)	(0.369)	(0.872)
SHARPE RATIO	–0.079	–0.056	–0.126
	(0.035)**	(0.233)	(0.018)**
EQUITY/ASSET	–0.023	–0.016	–0.032
	(0.000)***	(0.033)**	(0.000)***
LOAN/ASSET	0.0005	–0.001	0.002
	(0.564)	(0.380)	(0.048)**
CHRG/LOAN	–0.036	–0.024	–0.059
	(0.011)**	(0.121)	(0.038)**
DEP/LIAB	–0.003	–0.005	–0.001
	(0.081)*	(0.039)**	(0.619)
LOG ASSETS	0.005	–0.067	0.102
	(0.864)	(0.068)*	(0.008)***
LEADBANK HC	0.019	0.050	–0.036
	(0.483)	(0.159)	(0.369)
NONLEAD SREG	0.121	0.190	–0.005
	(0.002)***	(0.000)***	(0.933)
NONLEAD DREG	0.489	0.577	0.347
	(0.000)***	(0.000)***	(0.000)***
FED	0.079	0.215	–0.160
	(0.017)**	(0.000)***	(0.004)***
FDIC	–0.274	–0.356	–0.184
	(0.000)***	(0.000)***	(0.000)***
Pseudo-R^2	0.044	0.060	0.027
Observations	243,714	165,268	78,446

*Significant at 10 percent level.
**Significant at 5 percent level.
***Significant at 1 percent level.
Notes: The data are from 1977 to 2003, with year dummies not shown. The dependent variable is a dummy for whether a bank switches regulators in the next calendar year. Other variable definitions are given in the text. Robust p values adjusted for cluster effects are in parentheses.
Source: Data from Federal Deposit Insurance Corporation, 1977–2003, *Reports of Income and Condition*, Washington, DC.

Performance of banks that switch regulators

In this section, I examine the change in performance at banks that switch regulators, comparing return and risk before and after a switch. This allows us to address two issues. The first is whether switching is good for banks and the second is whether it is good for society. Beneficial competition implies that banks can benefit from switching while the probability of bank failure (our proxy for social welfare) does not increase. If switching allows banks to take actions that increase the risk of bank failure, then that is evidence consistent with a race for the bottom. The section is divided into two parts. I examine the accounting measures of performance in the first part and then a failure prediction model in the second part.

Accounting measures of performance

To examine how performance changes preceding and following a switch of regulators, I use the following model:

2) *Performance = f(Pre-change indicators, Post-change indicators, Control variables),*

where *performance* is measured using our return and risk variables. The model is estimated for the entire sample of banks, not just banks that switched. This allows us to compare changes in performance at banks that switch with otherwise similar banks that have not.

A priori, there is no reason to believe that the changes induced by a switch of regulators should be immediately reflected in the performance. For this reason, I look over five-year periods before and after a switch. This allows a long enough time before a switch to see whether there was some change in a bank's performance that might prompt a switch. It also allows a long enough time after a switch to ensure that all the changes that result from it are reflected in the accounting data I examine. For banks that switch regulators, I use dummy variables for pre- and post-switch periods as well as a trend variable. Let *DUMMY PRE*, the pre-switch dummy, equal 1 for each of the five years prior to a switch (year $t-5$ to $t-1$ for a switch in year t) and equal 0 otherwise. Similarly, let *DUMMY POST*, the post-switch dummy, equal 1 for each of the five years following a switch (year $t+1$ to $t+5$ for a switch in year t) and equal 0 otherwise. For banks that never switch, both *DUMMY PRE* and *DUMMY POST* equal 0. I set the trend variables so that they are increasing in time. For banks that switch in year t, let *TREND PRE* take the value 1 in year $t-5$, 2 in year $t-4$, and so on until it has the value 5 in year $t-1$. For other years and other banks, it equals 0. Similarly, define *TREND POST* as taking the value 1 in year $t+1$, 2 in year $t+2$, and so on until it has the

value 5 in year $t + 5$ for switchers, and the value 0 otherwise.

The control variables are similar to those in the prediction model in the previous section. The risk choices a bank makes affect its return and vice versa. Thus, I include risk and return variables as controls (excluding the performance measure being estimated). Results are qualitatively similar without these controls. I also include the structural controls from the prediction model. These cover the holding company status and regulator of a bank. Finally, I use the log of total assets as a control, since larger banks are more diversified, all else being equal, and year dummies to control for systemic changes.

Table 4 presents the results of regressions using equation 2 for the risk and return measures. Panel A gives the regression coefficients. Some but not all of the trend and dummy variables are significant. What I am most concerned with is the net change following a switch. For example, the post-switch trend is significant for the ROA, but the post-switch is not. What does this say about the net change in ROA? To get an idea of how important these changes are, it is necessary to combine the trend and dummy variables. For example, five years prior to a switch, the average bank has an ROA that is 0.016 percentage points below that of an otherwise similar bank that never switches ($0.016 = -0.018 + 0.002 \times 1$). By the year before the switch, ROA is 0.008 percentage points below that of an otherwise similar bank that never switches ($0.008 = -0.018 + 0.002 \times 5$ with rounding), indicating an increase of 0.008 percentage points in ROA in the four years before a bank switches. The increasing return after a switch is such that five years after a switch, the average bank has an ROA that is 0.083 percentage points above that of an otherwise similar bank that never switches ($0.083 = 0.008 + 0.015 \times 5$ with rounding). Panel B of table 4 presents the estimated changes for the years before and after a switch.

The results for the period prior to a switch indicate that banks are changing their balance sheets significantly prior to a switch. Leverage increases as the equity-to-asset ratio falls. Banks are also shedding loans. If examiners want a quiet life, then changes such as these may make them unhappy. This may, in turn, make it more probable that a bank will switch regulators.

The results in panel B of table 4 show that return rises significantly in the five years after a switch. They also provide evidence on the accounting risk measures. Overall, the picture on risk changes before and after a switch is mixed. The key factors are that the Sharpe ratio is unchanged but the equity-to-asset ratio decreases heading into and following a switch.

To get an idea of how the risk and return changes compare after a switch, I use the data in panel B of table 4 to compare the percentage change in the equity-to-asset ratio (the risk measure that increases) to the percentage change in ROA. The percentage change is measured by dividing the change by the pre-switch mean and is given in the final row of the table. From the year prior to a switch to five years after the switch, ROA is estimated to increase by 0.091 percentage points, 9.8 percent of the average ROA prior to the switch. Over a similar period, the equity-to-asset ratio is estimated to decrease by 0.463 percentage points, 5.3 percent of the average ratio prior to a switch. Thus, return increases by a larger fraction than the risk (as measured by the accounting variables) increases. This, in combination with no significant change in the Sharpe ratio, suggests that banks do better following a switch and provides no evidence that social risk increases.

Recall that the regression results in table 3 show that the factors that lead banks to switch regulators have changed over time. It makes sense, then, to see whether the performance of banks before and after a switch differs over time. To do this, let *EARLY* be a dummy variable that takes the value 1 if a bank switches regulators between 1977 and 1991, and let *LATE* be a dummy variable that takes the value 1 if a bank switches regulators between 1992 and 2003. I create a series of eight interaction variables using these dummies. Each interaction variable is the product of one of the period dummies and either *TREND PRE*, *DUMMY PRE*, *TREND POST*, or *DUMMY POST*. Using these variables, I estimate equation 2. Rather than presenting the entire regression results, table 5 gives the estimated changes relative to otherwise similar banks that have not switched in the accounting return and risk measures for the three periods, mirroring panel B of table 4.[13] It is clear from the table that the effect of switching on return appears only in the late period. Return increases significantly in the late period but changes little in the early period. The effect of a switch on risk is mixed in both periods but is driven by different factors in each. In the early period, the Sharpe ratio is unchanged and charge-offs decrease, signaling no change or a decrease in risk. But, the equity-to-asset ratio increases, indicating higher risk. In the late period, on the other hand, the Sharpe ratio increases (in large part due to the increase in ROA), while charge-offs also increase. The only constant is that banks add leverage following a switch in both periods. Also, while the coefficient on the change after a switch in the late period is positive for the charge-off-to-loan ratio regression, a deeper examination of the data (not shown) indicates that the positive coefficient reflects

TABLE 4

Performance regressions

A. Regression coefficients

	Return on assets	Sharpe ratio	Equity-to-asset ratio	Loan-to-asset ratio	Charge-off-to-loan ratio	Deposit-to-liability ratio
TREND PRE	0.002	–0.002	–0.079	–0.502	–0.004	–0.067
	(0.724)	(0.746)	(0.000)***	(0.000)***	(0.578)	(0.254)
DUMMY PRE	–0.018	–0.018	0.021	2.724	–0.008	–0.019
	(0.533)	(0.441)	(0.832)	(0.000)***	(0.805)	(0.937)
TREND POST	0.015	0.002	–0.097	–0.222	0.005	0.102
	(0.045)**	(0.671)	(0.000)***	(0.102)	(0.690)	(0.129)
DUMMY POST	0.008	–0.006	–0.353	0.938	–0.047	–0.349
	(0.739)	(0.779)	(0.000)***	(0.044)**	(0.145)	(0.199)
ROA			1.467	–0.026	–0.672	0.415
			(0.000)***	(0.855)	(0.000)***	(0.000)***
SHARPE RATIO			–0.617	–1.410	–0.234	–0.014
			(0.000)***	(0.000)***	(0.000)***	(0.797)
EQUITY/ASSET	0.071	0.033		–1.310	0.027	0.019
	(0.000)***	(0.000)***		(0.000)***	(0.000)***	(0.212)
LOAN/ASSET	–0.003	–0.002	–0.041		–0.004	0.002
	(0.000)***	(0.000)***	(0.000)***		(0.000)***	(0.527)
CHRG/LOAN	–0.138	–0.096	0.058	–0.279		0.007
	(0.066)*	(0.066)*	(0.092)*	(0.021)**		(0.660)
DEP/LIAB	0.007	0.003	0.003	0.014	0.001	
	(0.000)***	(0.000)***	(0.219)	(0.524)	(0.669)	
LOG ASSETS	0.267	0.164	–1.159	2.348	0.077	–5.152
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
LEADBANK HC	0.163	0.068	–0.913	0.932	0.074	–0.453
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
NONLEAD SREG	0.059	0.013	–0.991	2.225	–0.001	–1.168
	(0.000)***	(0.107)	(0.000)***	(0.000)***	(0.905)	(0.000)***
NONLEAD DREG	0.065	–0.002	–0.926	1.611	0.031	–0.782
	(0.000)***	(0.810)	(0.000)***	(0.000)***	(0.533)	(0.000)***
FED	0.001	0.018	0.243	2.056	0.002	–0.790
	(0.956)	(0.036)**	(0.000)***	(0.000)***	(0.962)	(0.000)***
FDIC	0.103	0.063	0.056	1.698	0.062	–0.069
	(0.000)***	(0.000)***	(0.072)*	(0.000)***	(0.000)***	(0.334)
Observations	253,291	249,988	249,988	249,988	249,988	249,988
R^2	0.245	0.188	0.312	0.159	0.167	0.212

B. Estimated changes in accounting variables

	Return on assets	Sharpe ratio	Equity-to-asset ratio	Loan-to-asset ratio	Charge-off-to-loan ratio	Deposit-to-liability ratio
Change from 5 years prior to switch to 1 year prior to switch	0.008 (0.724)	–0.008 (0.746)	–0.315 (0.000)***	–2.009 (0.000)***	–0.017 (0.578)	–0.268 (0.254)
Change from 1 year prior to switch to 1 year after switch	0.029 (0.195)	0.025 (0.197)	–0.076 (0.000)***	–0.503 (0.223)	–0.013 (0.629)	0.107 (0.638)
Change from 1 year prior to 5 years after switch	0.091 (0.001)***	0.034 (0.139)	–0.463 (0.000)***	–0.396 (0.500)	0.006 (0.897)	0.517 (0.072)*
Change from 1 year prior to 5 years after switch divided by sample mean	0.098	0.040	–0.053	–0.007	0.014	0.005

*Significant at 10 percent level.
**Significant at 5 percent level.
***Significant at 1 percent level.
Notes: The data are from 1977 to 2003, with year dummies not shown. Variable definitions are given in the text. For both panels A and B, robust p values adjusted for cluster effects are in parentheses.
Source: Data from Federal Deposit Insurance Corporation, 1977–2003, *Reports of Income and Condition,* Washington, DC.

TABLE 5

Performance by periods, early (1977–91) and late (1992–2003)

	Return on assets		Sharpe ratio		Equity-to-asset ratio	
	Early	Late	Early	Late	Early	Late
Change from 5 years prior to switch to 1 year prior to switch	0.005 (0.894)	0.025 (0.553)	–0.033 (0.319)	0.046 (0.161)	–0.299 (0.008)***	–0.235 (0.132)
Change from 1 year prior to switch to 1 year after switch	–0.046 (0.177)	0.115 (0.000)***	–0.027 (0.363)	0.081 (0.001)***	–0.038 (0.673)	–0.116 (0.331)
Change from 1 year prior to 5 years after switch	–0.012 (0.774)	0.211 (0.000)***	–0.024 (0.490)	0.101 (0.000)***	–0.324 (0.005)***	–0.629 (0.000)***
Change from 1 year prior to 5 years after switch divided by sample mean	0.014	0.205	0.029	0.117	0.039	0.068

	Loan-to-asset ratio		Charge-off-to-loan ratio		Deposit-to-liability ratio	
	Early	Late	Early	Late	Early	Late
Change from 5 years prior to switch to 1 year prior to switch	–2.811 (0.000)***	–1.019 (0.189)	–0.017 (0.690)	–0.017 (0.704)	–0.439 (0.137)	0.057 (0.894)
Change from 1 year prior to switch to 1 year after switch	0.579 (0.324)	0.299 (0.642)	–0.417 (0.066)*	0.053 (0.085)*	–0.243 (0.885)	–0.211 (0.557)
Change from 1 year prior to 5 years after switch	0.623 (0.403)	–1.634 (0.078)*	–0.147 (0.003)***	0.186 (0.013)**	0.578 (0.094)*	0.419 (0.401)
Change from 1 year prior to 5 years after switch divided by sample mean	0.012	0.027	0.258	0.736	0.006	0.004

*Significant at 10 percent level.
**Significant at 5 percent level.
***Significant at 1 percent level.

Notes: The results are based on regressions of equation 1 with interaction terms between the period dummies and the pre- and post-switch dummies and trend variables. Each regression has 249,988 observations. The change variables are calculated based on the coefficients on the interaction involving the pre- and post-switch dummies and trend variables. Variable definitions are given in the text. Robust p values adjusted for cluster effects are given in parentheses.

Source: Data from Federal Deposit Insurance Corporation, 1977–2003, *Reports of Income and Condition*, Washington, DC.

a large decline in charge-offs at banks that do not switch rather than an increase at banks that switch.

The results in table 5 point out characteristics of switchers and switching in the two periods, 1977–91 and 1992–2003. Prior to a switch, there is not much difference between the banks that switch in the early and late periods. Return is flat, and the equity-to-asset and loan-to-asset ratios are decreasing, although the change in the two ratios is only significant in the early period.

The major differences between the two periods are in the change in return and risk at banks that switch. The most important is that return increases after a switch only in the late period. In the early period, the average change in return is statistically and economically insignificant. The findings for risk are mixed in both periods. In the early period, there is no change in the Sharpe ratio following a switch. This may reflect the balancing of higher leverage and lower charge-offs. In the late period, on the other hand, the Sharpe ratio is increasing following a switch, indicating a reduction in risk. However, leverage and charge-offs are increasing, signifying higher risk.

The evidence using the accounting data is consistent with beneficial competition, but only in the post-1991 period. Return increases after a switch in the late period, but not in the early period. The results for risk are mixed, but there is no strong indication of higher risk. In the late period, the best measure of risk—the Sharpe ratio—signals a reduction in risk after a switch. These findings are indicative of beneficial competition among regulatory agencies. However, before drawing stronger conclusions, I need to examine the direct measure of failure probabilities.

Failure probability model

The accounting data present a mixed picture of how switching primary federal regulators affects risk. From a social perspective, the critical issue is whether the changes in risk promote bank failure. To directly examine this, I use a failure prediction model.

I use two approaches to determine whether switching regulators makes a bank more likely to fail than if it had not switched. First, I estimate a failure prediction model with a dummy for whether a bank has recently switched regulators. Since so few banks fail in any given year (approximately 0.5 percent per year), I look at three- and five-year horizons to minimize noise in the model. Let *FAIL DUMMY X* be a variable that takes the value 1 in year *t* if a bank fails prior to the end of year $t + x$, where x is either 3 years or 5 years. In my sample, an average of 1.5 percent of banks fail over a three-year horizon and 2.3 percent fail over a five-year horizon. For banks that switch regulators, I include just data for the years following the switch because a bank's decision to switch is only observed if it survives long enough to complete the switch. To include switches in the failure prediction model, let *SWITCH* be a dummy variable that takes the value 1 if a bank has switched regulators within the past three years, and the value 0 otherwise.[14] I also interact *SWITCH* with the period dummies.

For the prediction model, failure is assumed to depend on the accounting return and risk measures used earlier, as well as the log of total assets (since larger banks are more diversified) and year dummies to capture systemic movements in failure probabilities:

3) *FAIL DUMMY X = f*(*SWITCH, LOG ASSETS, ROA, SHARPE RATIO, EQUITY/ASSET, LOAN/ASSET, CHRG/LOAN, DEP/LIAB, year dummies*).

I estimate the model two ways. First, to establish a baseline, I only include observations for banks that never switch. Then, I include all banks. The model is estimated over the years 1977–2001 to allow at least three years after a switch for banks to potentially fail (since I have failure data through 2004).

In the analysis of the accounting data, I dropped outliers because they often have a disproportionate effect on regression results. In this section, on the other hand, all observations are included except banks with negative equity (since these have effectively failed already). This is because it is precisely the outlier banks, at least those in the lower tail, that are most likely to fail in the near term. Excluding the outliers pushes the results more toward switches reducing the probability of failure, although, for the most part, the differences are not statistically significant.

Table 6 presents the results of estimating equation 3 using a logistic regression. The signs of the coefficients on the control variables are consistent with expectations. Increasing either size or return decreases failure probability, while increasing risk has the opposite effect. The coefficient on *SWITCH* is statistically insignificant for both the three- and five-year failure windows. This is not consistent with the hypothesis that, all else being equal, a bank that has recently switched regulators is more likely to fail than an otherwise similar bank that has never switched.

The final column of table 6 includes the interaction terms between *SWITCH* and the time dummies. In this regression, the coefficient on *SWITCH LATE* is positive and significant. The positive coefficient on *SWITCH LATE* is consistent with the hypothesis that, all else being equal, a bank that switched regulators in the late period is more likely to fail than an otherwise similar bank that has never switched.

The careful wording in the last sentences of the previous two paragraphs reflects an assumption implicit in the failure prediction model (equation 3). The model assumes that a switching bank would have the same risk–return profile whether or not it had switched. In essence, it rules out the possibility that a bank is able to, or chooses to, change its portfolio precisely because it has switched regulators. For example, a regulator involved in a race for the bottom might attract new banks by allowing those banks to greatly increase leverage (that is, decrease their equity-to-asset ratio) after they switched to its oversight. If banks that switched increased leverage, they would be more likely to fail. However, if these banks failed at the rate that otherwise similar banks *with their new level of leverage* failed, then the coefficients on the switch dummies in equation 3 would not be significantly positive. Related to this proposition, if regulatory specialization allows banks that switch regulators to increase return and reduce their failure rate, but the failure rate is still above that at otherwise similar banks *with their new ROA*, then the coefficients on the switch dummies in equation 3 would be significantly positive. Since ROA increases for banks that switch regulators in the late period, this means that the significant positive coefficient on *SWITCH LATE* does not necessarily imply that there is a race for the bottom in that period.

A second approach is to assume that a bank would have kept its pre-switch risk–return profile had it not changed regulators. By taking this approach, I can then examine whether a switching bank has a higher

TABLE 6

Predicted failure probabilities

	(1) FAIL DUMMY 3	(2) FAIL DUMMY 3	(3) FAIL DUMMY 5	(4) FAIL DUMMY 5	(5) FAIL DUMMY 5
SWITCH		–0.087		–0.014	
		(0.543)		(0.895)	
SWITCH EARLY					–0.074
					(0.513)
SWITCH LATE					0.674
					(0.040)**
LOG ASSETS	–0.422	–0.429	–0.456	–0.464	–0.464
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
ROA	–0.095	–0.091	–0.092	–0.087	–0.087
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
SHARPE RATIO	–0.817	–0.823	–0.676	–0.681	–0.681
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
EQUITY/ASSET	–0.318	–0.319	–0.227	–0.230	–0.230
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
LOAN/ASSET	0.059	0.060	0.064	0.064	0.064
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
CHRG/LOAN	–0.011	–0.010	0.001	0.001	0.001
	(0.266)	(0.278)	(0.263)	(0.265)	(0.267)
DEP/LIAB	0.003	0.004	0.004	0.004	0.004
	(0.332)	(0.297)	(0.155)	(0.154)	(0.154)
Observations	225,066	228,980	225,066	228,980	228,980
Pseudo-R^2	0.365	0.364	0.297	0.296	0.296

*Significant at 10 percent level.
**Significant at 5 percent level.
***Significant at 1 percent level.

Notes: The regression is estimated for 1977 to 2001, with year dummies not shown. The logistic regressions in columns 1 and 3 include all banks that never switch primary federal regulators. The logistic regressions in the other columns include banks that never switch plus banks that have switched regulators in the previous six years (excluding the year of the switch). Variable definitions are given in the text. Robust p values adjusted for cluster effects are given in parentheses.

Source: Data from Federal Deposit Insurance Corporation, 1977–2003, *Reports of Income and Condition*, Washington, DC.

failure rate after its change than its steadfast counterparts with similar pre-switching profiles. To do this, I compare the predicted failure probability of the bank in the year it switches with the actual failure rate. To get the predicted failure probability, I use the five-year failure rate model estimated over banks that never switch regulators (that is, the model with coefficients reported in column 3 of Table 6). Table 7 gives the predicted and actual failure rates for all switches, broken down by the time of the switch and the type of switch (both merger-related and otherwise). There is no statistically or economically significant difference between the predicted and actual failure rates. Specifically, the failure rate is not higher for banks that switch regulators in the late period, even if the switches do not occur after a merger. This is consistent with the positive coefficient on *SWITCH LATE* in table 6 arising because banks that switch in the late period have lower failure rates than if they had not switched, but not as low as do banks with their new level of return.

Switches do not appear to increase failure risk. Using a simple failure prediction model, I have shown that for most switching banks, their post-switch failure rate is the same as that of otherwise similar banks. The one exception is found among banks that switch regulators after 1991. These banks fail at a higher rate than otherwise similar banks. However, the failure prediction model does not compare switchers to banks that are otherwise similar to the switchers prior to their changing regulators. In particular, in the late period, return increases for banks after a switch. Thus, the "higher failure rate" may be above that for banks with the new, high ROA, but it is lower than for banks with the pre-switch ROA. To test this, I have compared

TABLE 7

Predicted and actual failure rates for banks that switch regulators

	Predicted failure rate over the next five years using equation 3	Actual failures over the next five years	p value for test of difference between predicted and actual failure rate
Both periods (1977–2001)	1.82% (4.81)	1.46% (12.01)	0.242
Early period (1977–91)	2.99 (6.04)	2.46 (15.50)	0.311
Late period (1992–2001)	0.30 (1.38)	0.17 (4.10)	0.459

Notes: Failure rates over the next five years for banks that switch regulators as of the end of the year of the switch. The predicted failure rate is based on the coefficient for regression reported in column 3 of table 6. The standard deviations of the predicted and actual failure rates are in parentheses.
Source: Data from Federal Deposit Insurance Corporation, 1977–2003, *Reports of Income and Condition*, Washington, DC.

the actual failure rate to the level predicted in the year of a switch. I have found that the actual failure rate is no higher than the predicted rate, even for switches after 1991. This implies that switches in regulators do not increase the level of bank failures.

Robustness

The focus of this article is on changes of primary federal regulators. There are two potential alternative approaches to analyzing changes among banks that I address here. The first one involves an approach in which the choice of a national versus state charter is emphasized, without regard to the further choice of taking membership in the Federal Reserve System (for banks that elect state charters).[15] Using a switch of charters rather than a switch of primary federal regulators in the analysis does not change the qualitative results. When I replicate the performance regressions in table 4 or the failure prediction model in table 6 for changes of charters rather than changes of primary federal regulators, the same coefficients are significant at the 5 percent confidence level.

A second approach takes into account that for state-chartered banks, regulation is shared between federal regulators and state regulators. To control for the effect of state regulators, I add state dummies for banks with a state charter. The qualitative results are unchanged. Examining results on a state-by-state basis, there are not enough switches to obtain meaningful results, even for the largest states.

The choice of periods is motivated by changes in regulation and the pattern of banks that switch. To test the impact of the division, I run the regression (equation 1) with a separate set of switching trends and dummies for each year in which a bank might switch. I focus on the change in return between the year prior to a switch and five years after a switch. This analysis shows a distinct break between 1991 and 1992, with the change in performance mixed for changes prior to 1992, but consistently positive thereafter. This suggests that the break between the early and late periods is set correctly and is important.

In the main analysis, I exclude switches that might be related to a merger. As discussed earlier, roughly one-third of all switches are in the year of a merger or the following year. Because the threshold for switching following a merger is different than for switching at other times (and due to accounting issues), I dropped merger-related switches from the main sample. When I examine merger-related switches, the post-switch changes are qualitatively similar to those for switches at banks that did not merge in the period before and after the switch. There is an increase in return, but only in the late period, 1992–2003, and there is no unambiguous indication of an increase in either accounting or failure risk. Prior to the switch, however, there are differences in performance for merger-related and other switches. Heading into a merger-related switch, return is decreasing. This may be related to reasons behind the merger (including accounting issues)—and not to reasons behind the switch. Still, for the purposes of this article, the key is that the post-switch performance is similar for the two types of switchers.

Conclusion

This article has attempted to shed some light on the effects of having multiple regulatory agencies in commercial banking. I have studied the performance

of banks that switch their primary federal regulators as an indication of whether there is beneficial competition or a race for the bottom among agencies. Whether banks are able to increase return without increasing risk following a switch constitutes my test for beneficial competition. A race for the bottom would be evidenced by an increase in the failure rate of banks that switch, especially if there is no compensatory increase in return. Overall, I find evidence of beneficial competition instead of a race for the bottom, since return rises and failure rates remain effectively unchanged. However, this masks important differences over time.

The reasons for switching regulators may have changed over time. My sample includes banks that switched between 1977 and 2003, a period of massive changes in banking and bank regulation. I divide the sample into two smaller periods. The early period, 1977–1991, combines two time spans—one marked by the passage of the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) in 1980, the other notable for the initial lessening of prohibitions on interstate banking in the 1980s. Switches in the late 1970s and early 1980s may be a response to DIDMCA or to pre-DIDMCA differences among regulators. Switches in the 1980s through 1991 may reflect banks adjusting to their new competitive environment, although the rate of switching during this period was the lowest in my sample. Finally, in the late period, 1992–2003, prohibitions on interstate banking and on mergers between banks and other financial firms were essentially eliminated. Perhaps because of these changes, there was again a major merger wave in banking.

I find that switches in the early part of my sample—those prior to 1992—had little impact on bank performance. Return did not change significantly following a switch, and there was no unambiguous effect on accounting risk. Moreover, the evidence suggests that bank failure rates did not increase as the result of switches.

My results imply that banks switching regulators in the late part of my sample, 1992–2003, increased return without a rise in bank failures. This is evidence of beneficial competition among regulators, and supports the hypothesis that there is specialization among them. Interestingly, starting in 1992, there was an increase in the rate of regulatory switching that lasted through at least 2003. It is possible that the increase in switches was associated with the onset of this type of beneficial competition.

Finally, note that this analysis is intrinsically limited to looking at one aspect of regulatory competition. While I find evidence of beneficial competition only in the post-1991 period, that should not be taken to imply that other types of beneficial competition did not exist throughout my sample period.

NOTES

[1]Regulatory authority for state-chartered banks is shared with the appropriate state chartering agencies. Unless otherwise stated, when I refer to a bank's "regulator" (or "primary regulator"), I mean its primary federal regulator.

[2]Butler and Macey (1988) point out that differences among regulators are not very large due in part to the use of federal supremacy laws. In essence, federal regulators impose their rules on state-chartered banks through direct regulation or by making federal deposit insurance conditional on accepting certain rules.

[3]Elliehausen (1998) gives estimates of the cost of regulation that range between 5 percent and 15 percent of non-interest expense, or between 2 percentage points and 6 percentage points of return on equity.

[4]It typically takes between 15 days and 30 days to change primary regulators. This time is necessary to get approval from the new regulator. The approval process can be longer if the new regulator chooses to do an exam prior to approving a new applicant; however, this is not generally done for banks that are financially strong and well managed.

[5]Another potential drawback of having multiple regulatory agencies is that the agencies may respond to their constituencies but ignore externalities. When externalities are important, control by local agencies may lead to too little regulation (Baumol and Oates, 1988; Stewart, 1992). As an example, for many years Britain did not control sulfur emissions from its power plants because prevailing winds blew them offshore, with most of the damage being felt in continental Europe (Lomas, 1988). I do not examine this here, since this sort of externality is not a big problem in banking.

[6]Greenspan spoke in October 1991. Later that year, Treasury Secretary Nicholas Brady made similar remarks. The OCC is part of the Treasury Department.

[7]In other industries, interpretation of regulations most frequently occurs at the agency level. There is literature that studies whether regulatory agencies act as Congress wants them to (see, for example, Libecap, 1996).

[8]Berger and Hannan (1998) talk about the desire of bankers for a quiet life.

[9]It is also possible to test the source of beneficial competition, but this is beyond the scope of this article. See Rosen (2003).

[10]Results using the ratio of nonperforming loans to total loans are more likely to indicate a reduction of risk after a switch than those using the charge-off-to-loan ratio are. Nonetheless, I use charge-offs rather than nonperforming loans since data on nonperforming loans are not available for the entire sample period.

[11]Whalen (2002) finds lower return and higher risk at banks that change charters.

[12]The early period actually comprises two different subperiods, one marked by the passage of the DIDMCA, the other notable for the1980s merger wave. Switching activity in the DIDMCA subperiod was higher than during the bulk of the 1980s. However, there was no economically important difference in the relative performance of banks that switched in either subperiod. Thus, to simplify the exposition, I combined my findings from the two subperiods.

[13]Recall that these are calculated by considering changes to the pre- and post-switch trend and dummy variables only.

[14]I use the three years following a switch as the base years (and thus, look at failures for either the first six or eight years after a switch). The reason to restrict how long after a switch I examine is that, eventually, one cannot attribute a failure to be the direct result of a switch. However, looking out further after a switch does not change the qualitative results.

[15]Whalen (2002) also examines banks that change their charters; however, that paper does not examine post-change performance indicators.

Amel, Dean F., 1991, "State laws affecting commercial bank branching, multibank holding company expansion, and interstate banking," Board of Governors of the Federal Reserve System, working paper.

Amel, Dean F., and Martha Starr-McCluer, 2002, "Market definition in banking: Recent evidence," *Antitrust Bulletin*, Vol. 47, No. 1, Spring, pp. 63–89.

Baumol, William J., and Wallace E. Oates, 1988, *The Theory of Environmental Policy*, Cambridge, UK: Cambridge University Press.

Berger, Allen N., and Timothy H. Hannan, 1998, "The efficiency cost of market power in the banking industry: A test of the 'quiet life' and related hypotheses," *Review of Economics and Statistics*, Vol. 80, No. 3, August, pp. 454–465.

Berger, Allen N., Margaret K. Kyle, and Joseph M. Scalise, 2000, "Did U.S. bank supervisors get tougher during the credit crunch? Did they get easier during the lending boom? Did it matter to bank lending?," in *Prudential Supervision: What Works and What Doesn't*, Frederic M. Mishkin (ed.), Chicago: University of Chicago Press, pp. 301–349.

Berger, Allen N., Gregory F. Udell, and Richard J. Rosen, 2005, "Does market size structure affect competition? The case of small business lending," Indiana University, working paper.

Butler, Henry N., and Jonathan R. Macey, 1988, "The myth of competition in the dual banking system," *Cornell Law Review*, Vol. 73, May, pp. 677–718.

Dick, Astrid A., 2006, "Nationwide branching and its impact on market structure, quality, and bank performance," *Journal of Business*, Vol. 79, No. 2, forthcoming.

Easterbrook, Frank H., and Daniel R. Fischel, 1991, *The Economic Structure of Corporate Law*, Cambridge, MA: Harvard University Press.

Elliehausen, Gregory, 1998, "The cost of bank regulation: A review of the evidence," Board of Governors of the Federal Reserve System, staff study, No. 171.

Kane, Edward J., 1989, *The S&L Insurance Mess: How Did It Happen?*, Washington, DC: Urban Institute Press.

Libecap, Gary D. (ed.), 1996, *Advances in the Study of Entrepreneurship, Innovation, and Economic Growth: Reinventing Government and the Problem of Bureaucracy*, Vol. 7, Greenwich, CT: JAI Press.

Lomas, Owen, 1988, "Environmental protection, economic conflict, and the European Community," *McGill Law Journal*, Vol. 33, No. 3, pp. 506–539.

Revesz, Richard L., 2000, "Federalism and regulation: Extrapolating from the analysis of environmental regulation in the United States," *Journal of International Economic Law*, Vol. 3, No. 2, June, pp. 219–233.

Romano, Roberta, 1998, "Empowering investors: A market approach to securities regulation," *Yale Law Journal*, Vol. 107, No. 8, June, pp. 2359–2430.

Rosen, Richard J., 2003, "Is three a crowd? Competition among regulators in banking," *Journal of Money, Credit, and Banking*, Vol. 35, No. 6, part 1, December, pp. 967–998.

Scott, Kenneth E., 1977, "The dual banking system: Model of competition in regulation," *Stanford Law Review*, Vol. 30, pp. 1–49.

Stewart, Richard B., 1992, "Environmental law in the United States and the European Community: Spillovers, cooperation, rivalry, institutions," *University of Chicago Legal Forum*, pp. 41–80.

Stigler, George J., 1971, "The economics theory of regulation," *Bell Journal of Economics*, Vol. 2, No. 1, pp. 3–21.

Tiebout, Charles, 1956, "A pure theory of local expenditures," *Journal of Political Economy*, Vol. 64, No. 5, October, pp. 416–424.

Whalen, Gary, 2002, "Charter flips by national banks," Office of the Comptroller of the Currency, working paper, No. WP2002-1, June.