KENNETH A. CAROW  
EDWARD J. KANE  
RAJESH P. NARAYANAN

Safety-Net Losses from Abandoning Glass–Steagall Restrictions

This paper evaluates the redistribution of gains surrounding regulatory relaxations in 1996 and 1997 and ultimate passage of the Financial Services Modernization Act (FSMA) of 1999. Gains in financial institution stocks may come from projected increases in efficiency, increases in the bargaining power of financial institutions, or greater access to the federal safety net. For customers seeking greater access to capital markets, gains in efficiency should result in increased benefits, but increases in bank bargaining power could increase funding costs and/or decrease capital market access. Customers may also lose as taxpayers who support the federal safety net. This paper finds evidence of potential taxpayer losses and increased bank bargaining power, especially vis-a-vis credit-constrained customers for whom safety-net subsidies are unlikely to be shifted forward. The stock prices of credit-constrained customers declined during FSMA event windows and in event windows associated with regulatory relaxations.

**JEL codes:** G21; G24; G28; L51

Keywords: too big to fail, Volcker rule, Glass–Steagall, safety-net subsidies.

**THE FINANCIAL SERVICES MODERNIZATION ACT OF 1999 (FSMA)** removed restrictions on entry for U.S. banks, securities firms, and insurance companies into one another’s signature product lines. FSMA repealed Glass–Steagall and Bank Holding Company Act limits on financial firms’ ability to engage in one...

For helpful comments on an earlier draft the authors wish to thank Phil Stulman, Diane Silkowski, and audiences at the Federal Reserve Banks of San Francisco and Kansas City.

KENNETH A. CAROW is the Professor of Finance, Department of Finance, Indiana University (E-mail: kcarow@indiana.edu). EDWARD J. KANE is the James E. Cleary Professor of Finance, Department of Finance, Boston College (E-mail: Edward.Kane@bc.edu). RAJESH P. NARAYANAN is the Associate Professor, Charles Cameron Professor of Finance, Department of Finance, Louisiana State University (E-mail: marayanan@lsu.edu).

Received January 25, 2008; and accepted in revised form March 30, 2011.

*Journal of Money, Credit and Banking*, Vol. 43, No. 7 (October 2011) © 2011 The Ohio State University
another's traditional activities, and also repealed limitations on bank insurance activities imposed by the National Banking Acts of 1864 and 1916. At the signing of the bill, Treasury Secretary Lawrence Summers predicted that the bill would benefit "American consumers, business and the national economy." However, given how long the previous regime survived, it is hard to believe that FSMA was truly a win-win proposition for all sectors of the economy. Regulatory adjustments usually generate a distribution of sectoral wins and losses and economic theory suggests that vulnerable customers might suffer losses. Financial organizations might have benefited more than—or even at the expense of—at least some customer sectors. This paper provides evidence of losses in the nonfinancial sector and the redistributive nature of the gains in the financial sector.

Secretary Summers' prediction of a win holds true for the financial sector. Examinations of event returns generated by regulatory and legislative developments preceding the enactment of FSMA indicate that the market believed that deregulation would benefit the financial sector. The financial sector moved quickly to take advantage of the new powers permitted by FSMA. Within one year of enactment, over 400 Financial Holding Companies were formed (Adkisson and Fraser 2003) and the percentage of interindustry mergers among financial firms increased from 11.5% in the three years before FSMA to 17.7% in the three years following FSMA.

The effect of relaxing Glass–Steagall restrictions on customers is less clear. Opportunities to realize operational and informational scale and scope economies from combining banking, insurance and securities activities within a single organization could simultaneously increase financial-sector profits and lower explicit customer funding costs. Moreover, diversification into new product lines could lower implicit customer costs by increasing the safety and durability of individual banking organizations and better protecting the investments that particular borrowers have made in bank relationships. On the other hand, product-line extension threatens to increase the size and complexity of institutions affected by the financial safety net, and/or strengthen the bank's competitive position vis-à-vis public credit markets and differently chartered competitors.

The fears of expanding access to the taxpayer funded safety net which were confirmed during the recent financial crisis have repeatedly been expressed with

1. Also known as the Gramm-Leach-Bliley Act (GLBA), FSMA let stand restrictions set by the Bank Holding Company Act of 1956 (BHCA) on nonfinancial firm entry into banking and on bank entry into "nonbanking" activities via subsidiary corporations.

2. Studies by Akhigbe and Whyte (2001), Carow and Heron (2002), Hendrikshott, Lee, and Thompson (2002), and Ye (2002) all indicate that investors expected the expanded opportunities for industry competition opened up by FSMA to allow large multiproduct financial institutions to improve their competitive position relative to more specialized industry participants. Insurance companies, investment banks, and commercial banks gained value, while insurance agencies, finance companies and thrifts lost value. We confirm these finding although we do not report results.

3. Based on data from the Securities Data Corporation (SDC) Mergers and Acquisitions database, the number of mergers between two of the three-digit NAICS codes associated with the financial services industry (NAICS codes 522, 523 and 524) averaged 11.5% for years 1997–1999, 17.7% for 2000–2002 and 20.4% for 2003–2005.

1368 : MONEY, CREDIT AND BANKING
product power expansion. In a 1997 testimony before Congress, Federal Reserve Chairman Greenspan warned,

"We are concerned that conducting securities and similar activities as principal in subsidiaries of U.S. banks does not create sufficient distance from the bank. Let me be clear that bank holding companies and their subsidiaries also benefit from the subsidy implicit in the safety net. Their capital costs are lower since a portion of the consolidated assets of the organization are in subsidiary depository institutions that have direct access to the safety net... Moreover, we reiterate our concern that, regardless of how restructuring is addressed, the Congress not impair the ability of the Federal Reserve to monitor large banking organizations and respond effectively to systemic crises." (Greenspan 1997, pp. 578-584)

Following the financial crisis, former Chairman Paul Volcker, has called for limiting the ability of financial institutions to shift risk onto the safety net, stating that, "banks should be barred from “sponsoring and capitalizing” hedge funds and private-equity firms, which are largely unregulated," and further advocating that "particularly strict supervision, with strong capital and collateral requirements, should be directed toward limiting proprietary securities and derivatives trading." The recently passed Dodd-Frank Act incorporates the Volcker rule, which restricts proprietary trading and bans certain relationships with hedge funds and private-equity funds. It was reasonable to wonder whether the growing size, complexity, and clout of megabanks could undermine authorities' ability to prevent securities or insurance risks from spilling onto the federal safety net, harming customers in their capacity as taxpayers.

Product line extension, by lengthening and widening the points of contact a bank has with its customers, strengthens the bank's control over firms' access to public and private securities markets which could limit access to alternative funding sources for relationship customers, raise their funding costs, and curtail their investment spending. Conglomerate institutions might be tempted to downplay relationship lending and to pass lower informational quasi-rates through to retail customers. With fewer competitors vying for a customer's business, resources devoted to analyzing customer-supplied information might fall and relationship customers might confront disadvantageous limit prices or pressure to liquidate collateral.

How projected efficiency gains would be shared between the financial and non-financial sectors depends on how FSMA-induced changes in the competitiveness of the funding environment alter the balance of bargaining power between banks and their customers and regulators. An individual customer stands to lose if increased bank bargaining power due to growth in size and product lines enables its bank to increase its share of scope economies and regulatory subsidies. It is reasonable to hypothesize that except for very large customers, FSMA might have strengthened the relative bargaining power of banks. The paper tests this hypothesis and confirms

---

the subsidiary implication that credit-constrained firms—defined as younger, smaller corporations with no outstanding public debt and demonstrable financing needs—would experience particularly strong bargaining-power effects.

Because markets are forward-looking, sectoral gains or losses should register as changes in stock values for constituent firms. Within our sample of customer firms, salient events in FSMA’s legislative progress produced a 2.55% cumulative decline in market capitalization while the average financial institution gained 1.20% in market value. Our statistical tests show that some of the gains recorded in the financial sector came as a transfer from stockholders in customer firms.

Within the customer sector, very large customers gained, while credit-constrained customers experienced losses. This subsector’s mean abnormal return cumulates to -5.04% over FSMA progress events. The mean loss for credit-unconstrained customers is only 1.68%. This pattern of customer losses is corroborated over a series of key regulatory actions that gradually expanded banking powers that preceded the enactment of FSMA. Over these regulatory events, the mean loss for credit-constrained customers cumulates to 2.61% but only 0.36% for credit-unconstrained customers. Cross-sectional regressions explaining individual-firm cumulative abnormal returns (CARs) confirm that small and credit-constrained customers suffered significant harm. Robustness tests show that cross-sectional results are qualitatively unaffected by variations in sampling screens, variable definitions, and model specification.

Along with the findings in Carow, Kane, and Narayanan (2006) that megamergers in the U.S. are associated with value losses for small, credit-constrained customers, these results support a role for relative bargaining power in apportioning relationship-specific rents between financial organizations and their customers. Increases in bank bargaining power resulted in value being transferred from the nonfinancial sector to the financial sector. These effects are consonant with the costs the financial crisis eventually visited on taxpayers, especially vis-a-vis credit-constrained customers for whom safety-net subsidies are unlikely to be shifted forward.

The body of the paper is organized as follows. Section 1 develops a conceptual framework that relies on the existence of relationship-specific rents to explain how relative bargaining power would determine the impact of financial modernization on customer welfare and derives testable hypotheses. Section 2 describes our statistical methods, whereas Section 3 presents and interprets our estimates. Section 4 summarizes the empirical evidence and relates it to other analyses of the effects of financial deregulation and banking consolidation.

1. FINANCIAL MODERNIZATION AND CUSTOMER WELFARE

Modern banking theory assigns banks a special role in information production and monitoring. The many points of contact a bank has with its repeat customers generate private information and mutual trust. Diamond’s delegated-monitoring hypothesis envisions that banks either win access to inside information from repeat customers or
uncover such information in the course of supporting and observing these customers' loan and deposit business (Diamond 1984).

Privileged information allows a bank to assess and to price the risk of lending to a relationship customer more accurately than the bank's competitors can price this risk. This makes close ties with banks valuable to healthy firms. In principle, abilities or capacities that create extra-normal rents are intangible assets. Their value can be expressed as a mutual claim to the capitalized flow (R) of reduced opportunity costs. The outcome of a bilateral bargaining process (BP) allocates R partly to the relationship customer (Rc) and partly to the bank (Rb) (Kane and Mulkel 1965):

\[ R(BP) = R_c(BP) + R_b(BP). \]  

(1)

Changes in a customer's Rc can arise either from changes in R or from changes in the balance of bargaining power (BP). Product-line extensions authorized by FSMA can increase the value of relationship rents by displacing high-cost specialized firms and by widening and lengthening the contact a bank has with its relationship customers. Cross-selling opportunities can uncover new information, improve monitoring capabilities, and decrease agency costs, while expanding opportunities to use privileged information might unlock scale and scope economies in various service capacities. However, increased size and an enhanced competitive position relative to public capital markets can also increase a bank's bargaining power and enable it to reduce Rc; the value of informational quasi-rents the market forces it to shift forward to relationship customers.

Research examining the initial foray of banks into securities underwriting indicates that some of the benefits enjoyed by banks in the joint production of lending and underwriting services are passed on to customers. Gande et al. (1997), Roten and Mullineaux (2002), and Yasuda (2005) find that public bonds underwritten by bank affiliates for borrowers carried lower underwriting fees than comparable issues underwritten by investment banks. Schenone (2004) and Drucker and Puri (2005) uncover similar evidence in equity markets. Gande, Puri and Saunders (1999) attribute the underwriting benefits to procompetitive forces that reduced underwriting fees marketwide, while Narayanan, Rangan, and Rangan (2004, 2007) show that to compete in such an environment, banks had to bond themselves not to engage in opportunistic behavior.

However, studies that adopt a longer period of examination and a more comprehensive account of bank relationships do reveal a change in the balance of bargaining power. Roten and Mullineaux's (2005) find that the lower spreads observed in the

5. Numerous studies confirm that banking relationships are valuable to firms. James and Smith (2000) survey studies that proxy the value of banking relationships by borrower stock-price response to origination or renewal of credit facilities. Petersen and Rajan (1994) and Berger and Udell (1995) are examples of studies of how enhanced credit availability and lower funding costs correlate with closer lending ties to banks.

6. Because R requires the cooperation of both parties in that they want to avoid outcomes that would eliminate the counterparty's incentive to renew the relationship, equilibria Rc and Rb should each be strictly positive.
early years of bank underwriting reverse in later years. Expanding the definition of
bank-firm relationships Calomiris and Pomeroy (2009) find that "universal
banks charge premiums for loans and underwriting services to extract value from
combined lending and underwriting relationships," despite evidence of cost advan-
tages for universal banks. Shivdasani and Song (2011) find that increased competition
in underwriting reduced the incentive for underwriters to produce new information
about issuer quality, resulting in more poor-quality issues being brought to mar-
et. Consistent with reduced screening incentives, Focarelli, Marques-Ibanez, and
Pozzolo (2011) find that bond issues underwritten by universal banks had higher
default rates than those underwritten by stand-alone banks.

While these studies sample firms that access public markets for their funding
needs, smaller firms may be especially vulnerable to shrinkage in the number of
competitors vying for their funding business. Parthasarathy (2005) finds that smaller,
unrated firms have not benefited from expanded bank power, choosing to rely on ge-
ographically proximate lenders for their funding needs. Diamond (1993) argues that,
in distress, firms that have few funding outlets face a threat of inefficient liquidation.
The danger is that, when a firm runs short of tangible capital, its creditors may ignore
intangible going-concern values in deciding between rolling over short-term loans
and liquidating customer collateral. Houston and James (1996) establish that firms
which already have public debt outstanding are less susceptible to such hold-up pres-
sure. However, benefits from access to public debt may be swamped if, as Druker
and Puri (2005) suggest, banks can link the availability of loans to customers’ use
of its investment-banking services. Kanatas and Qi (2003) show that increased bank
control over firms’ private and public securities markets enhances bank information
monopolies and increase the cost to a relationship customer of using an unrelated
investment bank to raise public capital. Customers could lose bargaining power in
two ways. First, a customer that seeks funds from the capital market faces a cost from
not using its relationship bank as its investment banker in the form of a "lemon's
discount." This discount reflects investor fears that the relationship bank deems the
customer uncreditworthy. Second, a bank’s information advantage in predicting the
timing of customer funding activity may generate limit-pricing opportunities. Em-
pirical research confirms the importance of these effects. Yasuda (2005), Ljungqvist,
Masston, and Wilhelm (2006), and Bharath et al. (2007) find that lending banks
disproportionately capture the future funding business of relationship customers.

Other countries’ experience in introducing universal banking supports the im-
portance of maintaining a competitive funding environment. In a traditional bank-
dominated system like Japan, Hanako and Hoshi (2002) and Kang and Liu (2007)
find that upon entry into investment banking, Japanese banks aggressively discounted
offering prices to attract investors and win market share only to subsequently raise
prices. Ber, Yafeh, and Yoshida (2002) develop similar evidence of customer losses
in Israel when banks were allowed to combine lending, underwriting, and fund
management.

Well-known “size effects” in lending also predict that the formation of larger,
more-complex banking institutions might adversely affect customer access to capital,
especially at small firms.\footnote{Berger, DeJarnette, and Strahan (1999) survey the evidence on the link between bank size and customer credit availability.} Confirming the presence of size effects, studies of merger events seldom find potential benefits for bank customers. Scale economies in lending appear to exist only at very small banks. Moreover, merger benefits are shifted to small customers only when markets are competitive. In the United States, Strahan and Weston (1998) and Berger et al. (1998) find small-business lending increases in mergers involving small banks, but decreases when large banks combine. Eli and Robinson (2004) show that large banks with security affiliates show significantly smaller proportions of small-business loans than similar banks that lack a security affiliate. Calomiris and Purnrajangkool (2005) find credit spreads increased following the merger of Fleet and BankBoston for medium-sized middle-market borrowers. Carow, Kane, and Narayan (2006) find that the megamergers in the U.S. lower the stock prices of small, credit-constrained customers. Heikinraut, Rauch, and Umber (2009) and Devos, Krishnamurthy, and Narayan (2010) find market power rents explain valuation increases for a large number of bank mergers across North America and Europe. Cetorelli and Strahan (2006) show that increases in bank concentration are associated with fewer, but larger industrial firms in local U.S. markets. Zarutskie (2006) shows that because interstate banking deregulation spurred merger activity, “newly formed firms used significantly less external debt, were smaller, and realized higher returns on assets,” which is consistent with their investing less due to greater financial constraints.

Studies of bank mergers in Norway and Italy also uncover losses for small firms. Karceski, Ongena, and Smith (2005) find that bank merger announcements reduce the equity value of small publicly traded Norwegian firms that are customers of the bank being absorbed and that the magnitude of the decline increases with target size. In Italian bank mergers, Sapia (2002) finds cocontract interest rates on bank loans decline when banks with small market shares combine, but increase in more-substantive mergers. In another study of Italian bank mergers, Patti and Gobbi (2007) find that merger frictions result in a loss of information in the new entity, resulting in an adverse effect on stock returns of firms borrowing from target banks. They note that “small firms experience a temporary reduction in outstanding credit if two of their lenders merge together.”

Political clout tends to increase whenever a bank attains or solidifies its megabank status. On the one hand, increased clout reduces the chance of failure. Many studies confirm the value of bank durability to customers. Slovin, Sushkev, and Polonchek (1993) examine the 1984 collapse and rescue of Continental Illinois Bank, and find that customers’ wealth rises and falls with fluctuations in the lending institution’s financial health. Kang and Stulz (2000), Bae, Ka, and Lir (2002), and Ongena, Smith, and Michaelsen (2003) show that adverse shocks to national banking systems reduced borrower stock prices in Japan, Korea, and Norway, respectively. On the other hand, by reducing the effectiveness of regulatory discipline, increased bank clout can hurt customers. Kane (2000) argues that in bank megamergers some of
the stock price increases experienced by targets and acquirers come from becoming increasingly "Too Big to Discipline Adequately." This contention is reinforced by Pennas and Unal's finding (2004) that the yields on the outstanding bonds of acquiring and target megabanks both decline.

Calomiris (1995) argues safety nets displace market discipline resulting in the costs of financial crises being carried by taxpayers rather than contracting parties. DeNicolo, Giannone, and Ariss (2010) demonstrate that bank consolidation is associated with greater financial instability. Caprio, Demirgüç-Kunt, and Kane (2010) argue that "financial crises have become more frequent and more expensive (in terms of losses per dollar of deposits) as safety nets have expanded." As taxpayers that may carry the costs of the financial safety net, market prices of all nonfinancial firms may be affected if legislation expands the safety net. As evidence of this potential stock price impact, Carbo, Kane, and Rodrigues (2009) and Huang, Zhou, and Zhu (2009) show that safety net support can be estimated from the banking organization's stock price. Devesh, Krishnamurthy, and Narayanan (2010) show that the stock gains surrounding megamergers are associated with too-big-to-fail gains which arise "from the ability to shift risk onto the government safety net." Campello, Graham, and Harvey (2010) and Duchin, Ozbas, and Sessou (2010) find that during a financial crisis, financially constrained firms lose greater value as they are more likely to eliminate value-adding projects.

The net effect of FSMA on any individual customer depends on whether the pass-through of regulatory subsidies and economies of scale and scope generated by growth in bank size and product lines outweighs losses from reductions in customer bargaining power. As taxpayers, all nonfinancial firms may carry the potential costs of the expansion of the safety net. Evaluating cross-sectional affects, it is reasonable to hypothesize that, except for very large customers, FSMA might have strengthened the relative bargaining power of banks. Credit-constrained firms—defined as younger, smaller corporations with demonstrable financing needs and no outstanding public debt—seem especially vulnerable to changes in the balance of bargaining power. Far from shifting subsidies forward into these firms' borrowing rate, as a bank increases in size and scope, it might prefer to charge them higher rates or to finance fewer of their growth opportunities. In this case, as the FSMA advanced through the enactment process, concern about the ability of credit-constrained firms to finance value-creating projects would reduce their stock prices.

2. METHODS

Event studies provide a statistical procedure for estimating the welfare effects of legislation. Schwert (1981) roots the method's evidential value in the strong
likelihood that markets are at least semistrong-form efficient. If stock prices incorporate relevant information as it becomes publicly available, observed changes in stock prices estimate changes in wealth occasioned by particular events. Wealth effects from "legislative progress" are identified with statistically significant deflections from a benchmark trajectory for expected returns on portfolios of stocks in relevant sectors and subsectors.

A legislative-progress event study begins by designating salient dates at which information is likely to have been transmitted to the market. Next, relevant stakeholder groups ("sectors") must be identified, and portfolios representative of these groups constructed. Finally, a model of pecevent "expected" returns on these portfolios must be developed to benchmark "normal" returns for each portfolio on the event days. How this paper proceeds through these steps is explained in the next three subsections.

2.1 Legislative Progress Events

Prior to the FSMA, banks devised clever ways to cross industry borders and regulators subsequently redrew the borders to legitimize most incursions. Because circumventive entry incurs continuing avoidance costs, even banking organizations that had successfully smuggled themselves across the borders could benefit from legitimizing or widening loopholes.

Over time, financial institutions' demand for new powers grew and regulatory agencies became increasingly willing to use their rule-making powers to relax statutory borders. For example, in the mid-1980s, the Federal Reserve Board authorized bank holding companies (BHCs) to establish "Section 20" subsidiaries that could underwrite previously "bank ineligible" securities activities merely by staying within evolving percentage-of-revenue and interaffilliate limits. On the insurance front, several state regulators (e.g., in South Dakota in 1983 and later in Delaware) permitted state-chartered banks (including institutions owned by out-of-state holding companies) to sell insurance products nationwide. FSMA fixed up and equalized financial institutions' rights to exercise banking, securities, and insurance powers within a single organization.

Prior to 1999, 12 Congresses repelled 12 attempts to pass similar legislation. On May 6, 1999, financial-modernization legislation advanced beyond the committee level for the first time, winning approval in the Senate. Our event timeline starts at this date and progresses to enactment six months later. On July 1, the House of Representatives approved its own version of the bill. A joint congressional committee formed to reconcile the two versions announced significant progress on October 13, although issues of regulatory jurisdiction remained unsettled. On October 15, the Federal Reserve and the Treasury announced that they had settled their jurisdictional issues. A final obstacle was White House insistence that the Community Reinvestment Act (CRA) not be undermined. A compromise between the White House and the House and Senate conferences surfaced on October 22 and a final conference report was issued on November 2. Both chambers passed the bill on November 4 and President
TABLE 1
FSMA LEGISLATIVE PROGRESS EVENTS

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 6, 1999</td>
<td>Senate approves Financial Services Modernization Act of 1999 (S.900)</td>
</tr>
<tr>
<td></td>
<td>35 Ayes - 44 Nays. President Clinton threatens a veto over provisions</td>
</tr>
<tr>
<td></td>
<td>concerning the Community Reinvestment Act.</td>
</tr>
<tr>
<td>July 1, 1999</td>
<td>House of Representatives approves H.R.10 by margin of 343 Ayes - 86</td>
</tr>
<tr>
<td></td>
<td>Nays.</td>
</tr>
<tr>
<td>October 12, 1999</td>
<td>Significant progress in reconciling the House and Senate bills is</td>
</tr>
<tr>
<td></td>
<td>announced.</td>
</tr>
<tr>
<td>October 12, 1999</td>
<td>Federal Reserve and Treasury Department announce agreement on</td>
</tr>
<tr>
<td></td>
<td>responsibility for regulating Financial Holding Companies and bank</td>
</tr>
<tr>
<td></td>
<td>subsidiaries.</td>
</tr>
<tr>
<td>October 22, 1999</td>
<td>Early-morning negotiations eliminate the threat of a presidential veto</td>
</tr>
<tr>
<td></td>
<td>White House and Conference Committee agree on compromise</td>
</tr>
<tr>
<td></td>
<td>provisions.</td>
</tr>
<tr>
<td>November 2, 1999</td>
<td>Conference report is signed by majority of conferees, clearing the way</td>
</tr>
<tr>
<td></td>
<td>for floor votes in the House and Senate.</td>
</tr>
<tr>
<td>November 4, 1999</td>
<td>Financial Services Modernization Act passes the Senate 90 Ayes - 8</td>
</tr>
<tr>
<td></td>
<td>Nays and the House 362 Ayes - 57 Nays.</td>
</tr>
<tr>
<td>November 12, 1999</td>
<td>President Clinton signs the Financial Services Modernization Act.</td>
</tr>
</tbody>
</table>

Clinton signed the Financial Services Modernization Act into law on November 12. Table 1 lists and dates these legislative-progress events. 10

FSMA partially ratified the status quo by effectively legitimizing prior regulatory relaxations, the most significant of which occurred in 1996 and 1997. Finding consistent cross-sectional patterns of stock returns across both the prior regulatory events and the ultimate passage of FSMA would substantially strengthen our findings. Three of the seven events summarized in Table 2 expanded Section 20 revenue limits and three events resulted in removal of significant "firewalls" between traditional banking and other affiliate activity. Together these six events authorize financial conglomerates to exercise expanded banking powers. The final event, the acquisition of the investment bank Alex Brown and Sons by Bankers Trust indicated that interindustry mergers might have become permissible. 11

2.2 The Sampling Frame

Our study samples two broad stakeholder groups: financial firms and their corporate customers. The Center for Research in Security Prices database (CRSP) contains 682 financial-services firms. This sample includes 268 U.S. banks (3-digit SIC code 602 but excluding the 4-digit SIC code 6029 and section 20 banks), 25 Section 20 banks, 194 thrifts (3-digit SIC 603), 33 finance companies (2-digit SIC 61), 45 investment

10. Information-generating event dates were identified using the Wall Street Journal Index, New York Times Index, Congressional Quarterly Weekly Report, and prior studies of FSMA. For greater details on individual event dates commonly used in the analysis of FSMA, see Akhigbe and Whyte (2001), Carow and Horon (2002), Henderson, Lee, and Tompkins (2002), and Yu (2002).

11. Niosyman, Rangan and Sundaram (2002) provide greater details on each of these regulatory events.
TABLE 2

Days of Significant News Announcements Regarding the Relaxation of the Glass-Steagall Act

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Event</th>
</tr>
</thead>
</table>
| July 15, 1996 | American Bankers Association urges the Fed to expand the reserve limits for...
| Aug 1, 1996  | The Federal Reserve Board proposed new regulations that would allow the bank...
| Oct 31, 1996 | The Fed voted today to remove restrictions on banks' marketing of brokerage...
| Dec 20, 1996 | By a unanimous vote, the Fed agreed to let bank holding companies earn as much...
| Jan 10, 1997 | The Federal Reserve Board proposed removing a majority of the prudential...
| Apr 7, 1997  | The Bankers Trust of New York Corp., in a move that removes the last brick from...
| Aug 22, 1997 | The Federal Reserve Board today announced modifications to the prudential limits...

Note: The first, second, and fourth events result in the increase of Section 5 of reserve limits from 10% to 14%. The third event results in the removal of "barricades" between the bank affiliate and the BHCA Section 7 subsidiary. The last event is the first BHCA acquisition of an investment bank since the passage of the Glass-Steagall Act. Event and event descriptions are cited by permission of the publishers from Reppen, Reagan, and Gurto (1993).

banks (2-digit SIC 62), 95 insurance companies, and 22 insurance agencies (3-digit SIC 641).

- Our sample of current and prospective customers is drawn from the universe of nonfinancial corporations. To be included in our study, a firm had to meet four data-availability criteria:

1. be traded on either the NYSE, AMEX, or NASDAQ,
2. have daily returns available on CRSP during 1999,
3. be traded on at least 70% of the possible trading days, and
4. have balance-sheet and income-statement data on Compustat.

Applying the first three data requirements to the CRSP dataset produced 6893 firms. The Compustat data requirement reduced the number of firms to 3820. Separating cut firms whose SIC code (\(= 6\)) classifies them as financial companies, and eliminating outliers (firms whose event-day return exceeds 15% in absolute value) narrowed the sample to 3008 customers.
1.77: MONEY, CREDIT AND BANKING

To represent the competitiveness of each customer’s funding environment, we construct the following measures for each customer.12

EFN: External Financing Needs, defined as planned investment minus internally generated funding.
PUB_DEBT: an indicator variable that takes on the value one if the firm has public bonds outstanding; and is zero otherwise.
AGE: Log number of years that the firm’s stock has been trading publicly.
SIZE: Log of asset size (in $Million).

Rajan and Zingales (1998) and Cetorelli and Gambera (2001) demonstrate that the growth of firms in need of external finance depends on the developmental state and industrial structure of the financial environment in which firms seek capital. As in Rajan and Zingales (1998), we define external funding needs as investment less earnings plus depreciation less working capital needs, divided by investment. Stahan and Weston (1998), Berger et al (1998), Karczewski, Ongena, and Smith (2004), and Sapra (2002) find that firm size is among the best proxies for customer bargaining power. Kadiyala and Qi (2003) identify age as an additional factor.Houston and James (1996) show that the presence of public debt mitigates adverse selection and hold-up costs. Parthasarathy (2007) proxies firm opacity with a combination of rating and size. To indicate the presence of public debt, we use an indicator variable. Consistent with these studies, we define a customer as potentially “credit-constrained” (denoted by a CREDIT_CONstrained indicator) when it lies in the less-favorable tail of the distribution of each of these four variables.13 CREDIT_CONstrained equals one when:

- EFN > 0,
- PUB_DEBT = 0,
- AGE = 10 years or less,
- SIZE = <$500 Million.

This definition yields 778 credit constrained-customers and 2230 credit unconstrained peers. Theory predicts that credit-constrained firms would be most likely to suffer (benefit) if FSMA reduces (expands) capital market access.

2.3 Model

To estimate event returns, we employ the multivariate regression model (MVRM). The MVRM model employs Zellner’s (1962) seemingly unrelated regression (SUR) framework. It specifies a simultaneous system of market models (one for each sectoral portfolio), explicitly conditioned on the occurrence (nonoccurrence) of the event. This model corrects for heteroskedasticity and for contemporaneous dependence of

12. Appendix A describes in a reproducible way how these variables are constructed.
13. In our robustness tests, we document consistent findings for alternative measures of credit constraint.
individual-equation errors. This allows us to test differences in sectoral responses to an event as well as to overcome problems associated with event-day clustering. The MVRM takes the form:

\[ r_{jt} = \alpha_j + \beta_j r_{mt} + \sum_{k=1}^{n} y_{jk} D_k + \epsilon_{jt}. \]  

Parameters and variables are defined as follows: \( r_{jt} \) is the return for portfolio \( j \) on day \( t \); \( \alpha_j \) is the value of the intercept for portfolio \( j \); \( \beta_j \) is the systematic risk of portfolio \( j \); \( r_{mt} \) is the market return on day \( t \); \( y_{jk} \) is the event-induced shift in the intercept (i.e., the abnormal return) generated by event \( k \); \( D_k \) is a dummy variable that takes on the value of 1 on the \( k \)th event date and on the day following the event, but is zero otherwise; \( \epsilon_{jt} \) is the error term for portfolio \( j \) on day \( t \).

The return on each portfolio \( j \) is constructed by weighting the returns of constituent firms equally. The equally weighted CRSP market index serves as the market proxy. Returns are observed during a 10.5-month period running from January 1, 1999 to November 15, 1999. This "event period" encompasses eight specific progress events.

Event dummies \( (D_k, k = 1, \ldots, 8) \) deviate from zero on the \( k \)th event date and on the day following the event. A two-day event window is selected to account for the diffusion of information following the event date. The coefficient of each \( D_k \) \( (y_{jk}) \) expresses the abnormal return on portfolio \( j \) generated by event \( k \). Net sectoral benefits derived from the Act are measured by the CAR which sums the \( y_{jk} \) responses over all eight events.

For the legislative-progress period as a whole, we first test whether CARs differ among the sectoral portfolios. Rejecting the null hypothesis would confirm that financial modernization impacted individual-sector portfolios differently. We also test the significance of the sum of CARs across the sectoral portfolios. Our inability to reject the null hypothesis would indicate that, contrary to the Treasury Secretary's claim, sectoral gains and losses generated by the event might be redistributive in nature, neither creating nor destroying wealth in the aggregate.

A similar analysis is completed for the seven regulatory events preceding FSMA. To compute abnormal returns, the model is estimated using returns from July 14, 1996 to August 26, 1997.

2.4 Cross-Sectional Tests

Whether due to projected changes in relationship value (R) or in bargaining power (BP), cumulated abnormal returns (CAR) express the net impact of FSMA on customer-relationship value (R_C). To investigate whether this net effect is significant,

14. For a more detailed explanation of the MVRM and of its advantages in testing the impact of regulatory events, see Binder (1985a and 1986a). While reporting the more traditional Brown and Warner (1985) test statistic, we focus on results on the more conservative SUR test statistics.

15. Conclusions are similar when the value-weighted CRSP market index is used.
we undertake a second round of testing. This round treats individual-customer CARs as joint proxies for relationship value (Ri) and bargaining power (BP). Individual-firm CARs are generated in the MVRM regressions as parameter estimates for sectoral portfolios.

Second-round regressions seek to approximate the following latent model:

\[ \text{CAR}_i = \alpha_i + \beta_i \text{R}_i + \gamma_i \text{BP}_i + \epsilon_i. \]  

(4)

In estimating (4), the joint influence of Ri and BP is proxied by variables that represent the intensity of the competitive and informational environment in which the customer must negotiate financing. Parameter estimates are for equation (5):

\[ \text{CAR}_i = \alpha_i + \beta_1 \text{EFN}_i + \beta_2 \text{SIZE}_i + \beta_3 \text{PUB.-DEBT}_i + \beta_4 \text{AGE}_i + \beta_5 \text{CREDIT.-CONSTRAINED}_i + \epsilon_i. \]  

(5)

3. RESULTS

3.1 Intersectoral Tests

We begin by estimating the MVRM model parsimoniously for two consolidated sectors: financial firms and corporate customers. Table 3 columns 1 and 2 present the results for the FSMA legislative events. For the two industry sectors, panel A shows that the average financial institution gained 1.20% in market value over the legislative progress period, but this value does not differ significantly from zero in the SUR model. Still, because 57.48% of the firms in the financial-sector portfolio experience positive abnormal returns, we can reject (at the 1% level) the null hypothesis that abnormal returns are evenly divided between positive and negative values. Explaining some of the benefits experienced by financial institutions, the average customer lost 2.55% of its market capitalization. Only 43.33% of the customer sample shows a positive CAR. A sign rank test confirms that this percentage differs significantly from 50%.

Results in panel B confirm that event returns experienced by financial institutions differ significantly from customer returns. Both the F-test and the Wilcoxon rank sum test reject the null hypothesis that event returns are the same for both sectors. While efficiency gains may exist, an F-test fails to reject the hypothesis that event returns across the consolidated sample sum to zero. This indicates that at least some of the institutions' gains are redistributive. In the aggregate, financial institutions fared better than their customers. Table 3 columns 3 and 4 present the results for the pre-FSMA regulatory events. The average financial institution gained 0.45% in market value, which is insignificantly different from zero in the SUR model. The average customer lost 0.22% of its market capitalization. As shown in panel B, event returns for financial institutions do not differ significantly from customer returns during the pre-FSMA regulatory events. The pre-FSMA events were less significant than the FSMA events, however, our hypothesis primarily relates to intersectoral returns.
TABLE 3
FSMA Intersectoral Tests

<table>
<thead>
<tr>
<th></th>
<th>Financial Events</th>
<th>Pre-FSMA Regulatory Events</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Customers</td>
<td>Customers</td>
</tr>
<tr>
<td>Number of Companies</td>
<td>682</td>
<td>682</td>
</tr>
<tr>
<td>Panel A: Abnormal returns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative abnormal returns (CAR)</td>
<td>1.20%</td>
<td>-2.55%</td>
</tr>
<tr>
<td>SUR t-statistic for $H_0: \text{CAR} = 0$</td>
<td>0.96</td>
<td>-4.06***</td>
</tr>
<tr>
<td>Brown and Warner t-statistic for $H_0: \text{CAR} = 0$</td>
<td>3.09***</td>
<td>-7.64***</td>
</tr>
<tr>
<td>Percent positive CARs</td>
<td>57.48%</td>
<td>43.35%</td>
</tr>
<tr>
<td>z-statistic for $H_0: % \text{positive CAR} = 50%$</td>
<td>3.91***</td>
<td>-7.04***</td>
</tr>
<tr>
<td>Panel B: Cross-sectoral hypotheses tests</td>
<td>0.0043, -.0061</td>
<td>0.4581, 0.3660</td>
</tr>
<tr>
<td>p-Value of SUR F-test and Wilcoxon rank sum test for $H_0: \text{CAR for financial portfolio} = \text{CAR for customer portfolio}$</td>
<td>0.3734</td>
<td>0.7704</td>
</tr>
<tr>
<td>p-Value of SUR F-test for $H_0: \text{CAR for financial portfolio} + \text{CAR for customer portfolio} = 0$</td>
<td>0.3734</td>
<td>0.7704</td>
</tr>
</tbody>
</table>

Note: For the FSMA legislative events (columns 1 and 2), abnormal returns are computed using a multivariate regression model. To estimate abnormal returns, a benchmark model is estimated using returns from January 1, 1998 to November 15, 1999, for the pre-FSMA regulatory events (columns 3 and 4), abnormal returns are computed using a multivariate regression model. To estimate abnormal returns, the model is estimated using returns from July 14, 1996 to August 2, 1997. *** indicates significance at the 1%, 5%, and 10% levels, respectively.

### 3.2 Intrasectoral Tests

To investigate wealth effects within the customer sector, we estimate MVRM models for two customer subsectors that distinguish credit-constrained and credit-unconstrained firms. Table 4 columns 1 and 2 disaggregate the customer subsector. Both subsectors lose market capitalization, but credit-constrained customers suffer more severely (-5.04%) than unconstrained firms (-1.68%). Parametric and nonparametric tests confirm that the wealth loss for credit-constrained customers is significantly greater than for unconstrained customers.

Table 4 columns 3 and 4 evaluates returns around the seven regulatory events preceding the passage of the FSMA. Intrasectoral returns corroborate the hypothesis that credit-constrained customers stood to lose value whenever authorities relaxed barriers between banking and investment banking firms. Credit-constrained customers suffer a significant decline in market cap of 2.61%. Parametric and nonparametric tests confirm that the wealth loss for credit-constrained customers significantly exceeds that for credit-unconstrained customers.
The intrasectoral tests suggest that, although prior studies indicate that some of the benefits achieved by commercial banks, securities firms, and insurance companies trace to opportunities to outcompete other financial sectors, additional gains came at customer expense and especially from small, credit-constrained firms.

3.3 Cross-Sectional Results

In Table 5 model 1, we treat CAR as an endogenous variable for individual firms. In the CAR regression, SIZE and the negative effect of CREDIT_CONSTRAINED prove significant at the 1% level. Other things equal, average stock-price revisions are less negative for larger firms and more negative for credit-constrained ones. This is predicted by the hypothesis that a customer’s bargaining power increases with its size and decreases with funding constraints. The marginal significance of PUB_DRIFT

16. The intercept may be interpreted as the CAR that would be recorded for a hypothetical firm with zero for values for all explanatory variables. Given the significantly positive coefficient for size, it is not surprising to find a significantly negative intercept.
TABLE 3
PSMA CROSS-SECTIONAL MODELS OF CUMULATIVE ABNORMAL RETURNS

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.0323</td>
<td>-0.0562</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt / Asset</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.0175</td>
</tr>
<tr>
<td>R&amp;D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIVIDEND</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Observations</td>
<td>3008</td>
<td>1218</td>
<td>2008</td>
<td>3008</td>
<td>2900</td>
</tr>
<tr>
<td>R²</td>
<td>0.0189</td>
<td>0.0149</td>
<td>0.0289</td>
<td>0.0119</td>
<td>0.0231</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.0173</td>
<td>0.0109</td>
<td>0.0246</td>
<td>0.0174</td>
<td></td>
</tr>
<tr>
<td>p-Value on F-stat</td>
<td>&lt;.0001</td>
<td>&lt;.0025</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

Notes: The dependent variable in the cumulative abnormal returns over the eight events listed in Table 1. The model was estimated using winsorized data from January 1, 1999 to November 30, 1999. Independent variables are winsorized (k = 5). Model 1 is a primary CAR model. Models 2 through 5 provide incremental evidence about persistence. Model 2 mimics the sample in Table 1 where LPC data are available. All independent variables are winsorized (k = 5). Model 3 replicates the model in Table 2, adding the number of observations (number of observations) to the right hand side of the model. Model 4 replicates the model in Table 2, adding the number of observations (number of observations) to the right hand side of the model. Model 5 replicates the model in Table 2, adding the number of observations (number of observations) to the right hand side of the model. Model 5 includes additional control variables: TANGIBLES and R&D. TANGIBLES equals the total value of assets divided by market value of assets (market value of assets = debt + equity + cash + cash equivalents). DIVIDEND is an indicator variable equal to 1 if the firm has paid dividends, and 0 otherwise. TANGIBLES and R&D are winsorized at the 5th and 95th percentiles. p-Values appear in parentheses below coefficient estimates. **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

The results are also consistent with the stock price reactions of customers surrounding bank acquisitions, as documented in Carow (2006). This variable becomes insignificant in robustness tests (reported later) that control for industry effects.

Implications for firms with public debt outstanding have more negative returns consistent with Drukker and Puri (2005) and Kanatas and Qi (2003) who argue that banks can link loan availability to investment banking services or use their information advantage to increase the cost to a relationship customer. The results are also consistent with the stock price reactions of customers surrounding bank acquisitions, as documented in Carow (2006). This variable becomes insignificant in robustness tests (reported later) that control for industry effects.

17. While measures such as size and public debt are correlated, we find no evidence of significant multicollinearity.

18. Employing CARs estimated in the first stage of our analysis in the second-stage analysis introduces additional variance in the cross-sectional regressions. We account for this additional source of variance.
Analyzing the abnormal returns around the seven regulatory events preceding passionate FSA support, we report cross-sectional regressions in Table 6. Model 1 includes further supportive results. We present results for credit-constrained banks. While the Glass-Steagall Act in 1999 and 1997 proves significantly lower for credit-constrained banks.

| Year | Dividend | Debt Asset | Turnoq | ROA | Profit Margin | Size
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>0.031</td>
<td>0.0002</td>
<td>0.0001</td>
<td>0.0004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>0.033</td>
<td>0.0002</td>
<td>0.0001</td>
<td>0.0004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>0.037</td>
<td>0.0002</td>
<td>0.0001</td>
<td>0.0004</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 6:** Cross-Sectional Regression Analysis: Impact of Regulatory Announcements on Credit Constraints
The significantly positive coefficients for customer size and credit restriction support the hypothesis that a customer's bargaining power increases with size and decreases with funding constraints.

3.4 Robustness Experiments

Tables 5 and 6 models 2-5 investigate the sensitivity of our results to variation in sampling screens and model specification. Our robustness tests reinforce evidence in the literature on bank mergers that large-bank consolidation is unfavorably affecting the price and/or availability of credit for capital-constrained firms.

3.4.1 Sampling current customers only. Table 4 and model 1 of Tables 5 and 6 analyze a sample drawn from the universe of current and prospective customers. Model 2 of Tables 5 and 6 estimates effects for a sample of current customers.

Using Loan Pricing Corporation's (LPC) Dealscan database, we identify firms that have an active loan facility with a sample bank that is designated to be either a sole lender or a lead lender in a syndicate. Identifying lead lenders by titles such as arranger, co-arranger, administrative agent, agent or co-agent, and imposing the data requirements specified earlier, yields a sample of 1218 (Table 2) and 1095 (Table 6) nonfinancial customers. This subsample of relationship customers omits weaker and developing relationships. While imposing these restrictions has the obvious advantage of identifying established relationship customers, it has the disadvantage of increasing the proportion of large firms (already an issue in sampling from the Dealscan universe) and reducing the number of credit-constrained customers.

Although results from either sample remain qualitatively similar, the restricted sampling strategy reduces the power of tests of the hypothesis that small, credit-constrained firms suffer disproportionately from the enactment of FSMA. As shown in the second column of Tables 5 and 6, the significance of the coefficients on customer CARs is similar in the restricted sample.

3.4.2 Alternative specifications. Industry type might affect both the character of a firm's credit needs and the availability of assets that can serve as collateral. Although $R^2$ improves, we find no qualitative differences from our benchmark results when we control in models 3 and 4 of Tables 5 and 6 for industry type with one-digit or two-digit SIC indicators. The last model introduces four other control variables: Tobin's Q, the debt-to-asset ratio, and indicators for dividends and for research and development expense. Although two of these further controls are significant, the signs of SIZE and CREDIT_CONSTR constrain remain significant.

20. The Loan Pricing Corporation's (LPC) Dealscan database provides details of loans over $100,000 compiled from 10,641, 10,686, 10,619, 10,719, 10,619, 10,719, and 5-series (registration) statements that publicly held companies and privately held companies with public debt outstanding file with the Securities Exchange Commission.

21. The number of credit-constrained customers in the restricted sample of 1218 "LPC" customers is 22% (or 18%). This comprises 768 (or 25.5%) credit-constrained customers in the primary sample of 3008 firms.
Our results are also insensitive to the importance of the events considered. Using the extent of coverage in the Wall Street Journal as a proxy for the importance of the FSMA events, we obtain similar cross-sectional results when we weight the returns for each event by the number of words in Wall Street Journal stories reporting on the event. Omitting any single event of the eight FSMA events in the analysis does not significantly change our results. Finally, it is possible that sampling the late stages of the bubble in technology stocks distorts our research. Although not reported here, the pattern of significant results proves much the same when we omit firms in the technology industry or use value-weighted market returns instead of equal-weighted market returns to calibrate abnormal returns.

3.5 Redefining Credit Constraint

By definition, credit-constrained customers lack internal resources for financing planned investment expenditures and have difficulty meeting their need for external funding. Our indicators for credit constraint combine the condition of facing a funding gap with three alternative measures of the narrowness of the firm’s funding environment: replacing assets with receivables; replacing the book value of assets with the market value of assets; and (to show that size per se does not drive our results) lowering the size cut-off to $250 million. None of the experiments alters the qualitative implications of our results.

The literature offers two other strategies for classifying firms as financially constrained. The first strategy is to assume a priori that a single characteristic constitutes an adequate proxy for financial constraint. Particular characteristics that others have used to classify a firm as financially constrained include: small size (Gertler and Gilchrist 1993); the absence of a bond rating (Kashyap, Lamont and Stein 1994); and dividend distributions (Fazzari, Hubbard and Petersen 1998). The impact of each of these characteristics has already been investigated in cross-sectional regression experiments.

The second approach combines several firm characteristics into an endogenous classification model: for example, by conditioning the retention ratio on Tobin’s Q (as in Korajczyk and Levy 2003) or by constructing indices (as in Kaplan and Zingales 1997) and Whited and Wu 2006). Korajczyk and Levy’s (2003) classification scheme embodies the idea that since dividends and security repurchases compete for funds with investments, firms with attractive investment opportunities and high costs for external finance may be expected to retain net income for investment purposes. Conditioning on Tobin’s Q helps to ensure that resource-constrained firms have meaningful investment opportunities and are not financially distressed. Kaplan and Zingales’ (1997) define an index where firms with greater debt, greater growth, lower cash flow, and lower dividends are more likely to be financially constrained. Whited and Wu (2006) use GMM to estimate an intertemporal model of investment and financial frictions. Whited and Wu interpret their index as a shadow price for external finance to which every firm must adjust in equilibrium. They show that their index meets the test of being a priced factor in a Fama–French model.
TABLE 7

CORRELATIONS BETWEEN ALTERNATIVE MEASURES OF FINANCIAL CONSTRAINT

<table>
<thead>
<tr>
<th></th>
<th>Sample Size</th>
<th>Credit Constrained</th>
<th>Whited and Wu (inversed measure)</th>
<th>Kaplan and Zingales</th>
<th>Koryczan and Levy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Constrained</td>
<td>3008</td>
<td>1.000</td>
<td>-0.2421</td>
<td>0.1298</td>
<td>0.2031</td>
</tr>
<tr>
<td>Whited and Wu (inversed measure)</td>
<td>2210</td>
<td>-0.2421</td>
<td>1.0000</td>
<td>-0.0001</td>
<td>-0.0001</td>
</tr>
<tr>
<td>Kaplan and Zingales</td>
<td>2199</td>
<td>0.1298</td>
<td>0.0778</td>
<td>1.0000</td>
<td>0.5635</td>
</tr>
<tr>
<td>Koryczan and Levy</td>
<td>2236</td>
<td>0.2031</td>
<td>-0.0001</td>
<td>0.5635</td>
<td>-0.0001</td>
</tr>
</tbody>
</table>


Panel B: Correlations with abnormal returns

<table>
<thead>
<tr>
<th>CAR (FSMA)</th>
<th>Coefficient</th>
<th>p-Value</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR (Federal Reserve's net balance sheet)</td>
<td>0.1303</td>
<td>0.0001</td>
<td>1,009</td>
</tr>
</tbody>
</table>

Note: Given that all these alternative measures of financial constraint are composites of the internal and external factors in our cross-sectional regression models, the original control variables are collinear with each of the alternative measures. For this reason, we report only the correlations using the alternative measures. The upper portion of the correlation table also describes the interconnection that exists between the two measures of financial constraint. The lower portion of the table shows the coefficients that describe the different measures of financial constraint and their relationship with other variables. The coefficients are all significant at the 0.05 level.

Panel A of Table 7 shows the correlation between these alternative measures and between each of them and our indicator variable (CREDIT_CONSTRANGED). The negative correlation with Whited and Wu's index is expected since their index of financial constraint is an inverse measure. Only the correlation between Whited and Wu's index of financial constraint and that of Kaplan and Zingales shows an unexpected sign. The correlations in Table 7 employ Compustat data available for fiscal year-end 1998. Panel B of Table 7 shows that no matter how we restrict our sample or which index we use, all indices indicate that credit-constrained firms exhibit significantly poorer abnormal returns across the two event chains.

3.6 Economic Impact

The Census Bureau reports size distributions for revenues at all public and private firms. To extrapolate results for our sample to the populations of financial and nonfinancial firms, we make a strong assumption. The assumption is that median gain and loss rates experienced by sample firms over the FSMA events are representative of the medians for the size classes found in Census data. On this assumption, calculations reproduced as an Appendix show that nonfinancial firms could have lost nine times...
as much from FSMA ($467 billion) as financial firms gained ($352 billion). The net loss is $415 billion (4.5% of 1999 GDP). The magnitude of the difference between these two estimates implies that much of the gains captured by the financial sector came as a transfer from stockholders in customer firms.

Such losses may be attributable to reduction in market power for nonfinancial firms and Snyder capacity as taxpayers who support the federal safety net. Evaluating European banks, Maudos and Guevara (2007) estimate the "social welfare loss attributable to market power in 2002 represented 0.54% of the GDP of the EU-15." Assuming a perpetual loss of 4% per year at a discount rate of 10%, the expected single year market value loss would be 5.4% of GDP. In Mexico, Solis and Maudos (2008) estimate that the "social cost attributable to market power in 2005 is 0.15% of GDP." Greater access to the federal safety net would be based on the present value of the costs of a financial crisis multiplied by the probability of occurrence. Government stimulus during the recent financial crisis is estimated at $1.77 trillion. Leaven and Valencia (2008) estimate GDP losses of 4% after a stock market crash and double for a housing crisis. During the financial crisis, Roger Altman, the former U.S. Deputy Treasury Secretary, estimated housing, savings, investment, retirement and pensions assets decreased by $8.3 trillion. Some estimate American net worth fell by $14 trillion.

Although other extrapolation methods might show much smaller imbalances, the disproportion indicates that the efficiency benefits of FSMA have been overstated in many studies of how corporate customers have fared under "universal banking." In particular, studies which focus on firms whose capital market access is assured find that the entry of banks into securities underwriting reduced issuance costs for borrowers and intimately linked banks to loan clients' future capital-raising activity. Our finding that large corporations gained supports the hypothesis that expanded product-market opportunities may have indeed raised the value of relationship-specific programs both for banks and for a relatively small subset of borrowers capable of accessing public capital markets; however, our data also show that firms with tenured capital-market access lost bargaining power and relationship benefits.

4. SUMMARY AND IMPLICATIONS

Previous investigations of event returns generated by the FSMA and piecemeal expansions of related loopholes show favorable effects on the stock prices of banks, investment banks, and insurance companies. These favorable effects are strongly predicted by partial-equilibrium analysis. The intensity of prior lobbying activity shows

---

22. Data are obtained from Stimulus.org. It excludes the December 2010 stimulus package that is estimated to add an additional $836 billion to the deficit. (Lari Montgomery, Shalagh Murray and William Ravina, "Obama signs bill to extend Bush-era tax cuts for two more years." Washington Post, December 17, 2010.) (http://www.washingtonpost.com/wp-dyn/content/article/2010/12/16/AR2010121606720.html?tid=topnews).


APPENDIX B: ESTIMATES OF FSMA-INDUCED AGGREGATE GAINS AND LOSSES ACROSS THE POPULATIONS OF US FINANCIAL AND NONFINANCIAL FIRMS

This table shows our estimates of the aggregate gains and losses for financial and nonfinancial firms. From the most recently available Census report prior to the passage of FSMA, "Enterprise Statistics", 1992, "Table 4, Company Statistics by Receipt Size", 1992 (http://www.census.gov/prod/3/97pubs/c2p201997.pdf), we obtain data on the number of public and private firms in the financial and nonfinancial industries. For each firm in our dataset, we define the dollar impact as the cumulative abnormal returns per firm. We classify the dollar impact of the median dollar impact shown in our sample and sum the values across the receipt categories. Due to the small number of observations in CRSP and Compustat for firms under $2.5 million in receipts, we omit these firms from this analysis. Because smaller, more credit-constrained nonfinancial firms are expected to have large losses, this omission is apt to underestimate the effect on nonfinancial firms.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5-4.9</td>
<td>170,104</td>
<td>188,994</td>
<td>31</td>
<td>(8,251)</td>
<td>(3,278,463,092)</td>
<td>11,110</td>
<td>4</td>
<td>Insufficient</td>
<td>Don't</td>
</tr>
<tr>
<td>5-10</td>
<td>204,543</td>
<td>220,156</td>
<td>75</td>
<td>(2,733)</td>
<td>(108,669,901)</td>
<td>6,291</td>
<td>12</td>
<td>(979,205)</td>
<td>(210,620)</td>
</tr>
<tr>
<td>10-24.9</td>
<td>60,099</td>
<td>66,652</td>
<td>87</td>
<td>(679)</td>
<td>(38,451,639)</td>
<td>4,347</td>
<td>64</td>
<td>(225)</td>
<td>(141)</td>
</tr>
<tr>
<td>25-49.9</td>
<td>19,982</td>
<td>20,323</td>
<td>233</td>
<td>(681)</td>
<td>(16,216,697)</td>
<td>1,460</td>
<td>102</td>
<td>983</td>
<td>(303,204)</td>
</tr>
<tr>
<td>50-99.9</td>
<td>8,228</td>
<td>8,581</td>
<td>305</td>
<td>(299)</td>
<td>(5,024,149)</td>
<td>139</td>
<td>116</td>
<td>(1,734)</td>
<td>(83,378)</td>
</tr>
<tr>
<td>100-249</td>
<td>5,028</td>
<td>5,468</td>
<td>318</td>
<td>(2,167)</td>
<td>(9,681,262)</td>
<td>560</td>
<td>127</td>
<td>700</td>
<td>970,278</td>
</tr>
<tr>
<td>250-409</td>
<td>1,191</td>
<td>1,494</td>
<td>389</td>
<td>(2,825)</td>
<td>(3,906,138)</td>
<td>207</td>
<td>70</td>
<td>17,703</td>
<td>4,725,021</td>
</tr>
<tr>
<td>500-1,020</td>
<td>654</td>
<td>756</td>
<td>347</td>
<td>(2,838)</td>
<td>(2,206,007)</td>
<td>198</td>
<td>39</td>
<td>19,935</td>
<td>4,304,669</td>
</tr>
<tr>
<td>1000-2,500</td>
<td>645</td>
<td>752</td>
<td>343</td>
<td>(2,043)</td>
<td>(1,086,392)</td>
<td>123</td>
<td>46</td>
<td>568</td>
<td>7,724,345</td>
</tr>
<tr>
<td>&gt;2,500</td>
<td>452</td>
<td>356</td>
<td>343</td>
<td>(5,747)</td>
<td>(3,469,478)</td>
<td>96</td>
<td>68</td>
<td>385,361</td>
<td>36,594,630</td>
</tr>
<tr>
<td>Totals</td>
<td>316,092</td>
<td>338,541</td>
<td>2,791</td>
<td>(2,747)</td>
<td>(5,067,367,168)</td>
<td>25,381</td>
<td>687</td>
<td>385,361</td>
<td>36,594,630</td>
</tr>
</tbody>
</table>
LITERATURE CITED


Queries

Q1 Author: Reference Akhigbe and Whyte has not been cited in the text. Please indicate where it should be cited; or delete from the Reference List.

Q2 Author: Reference Ber, Yafah, and Yoshia (2001) has not been cited in the text. Please indicate where it should be cited; or delete from the Reference List.

Q3 Author: Please provide university or institute name of the working paper in reference Calomiris and Porrojinaangkool (2005).

Q4 Author: Reference Caprio, Demirguc-Kunt, and Kane. (2006) has not been cited in the text. Please indicate where it should be cited; or delete from the Reference List.

Q5 Author: Please provide university or institute name of the working paper in references Carbo-Valverde, Kane, and Rodriguez-Fernandez (2009) and Caprio, Demirguc-Kunt, and Kane. (2008).

Q6 Author: Please provide university or institute name of the working paper in references De Nicolò and Arias (2010) and Devos, Krishnamurthy, and Narayanan (2010).

Q7 Author: Please provide university or institute name of the working paper in reference Focarelli, Marquez-Ibanez, and Pozzolo (2011).

Q8 Author: Reference Friiswick (2004) has not been cited in the text. Please indicate where it should be cited; or delete from the Reference List.

Q9 Author: Please provide university or institute name of the working paper in reference Hankir, Rauch, and Umber (2009).

Q10 Author: Reference Houston and James. (2001) has not been cited in the text. Please indicate where it should be cited; or delete from the Reference List.

Q11 Author: Please provide university or institute name of the working paper in reference Huang, Zhou, and Zhu (2009).

Q12 Author: Please provide university or institute name of the working paper in reference Leaven and Valencia. (2008).

Q13 Author: Please provide page range for reference Shidivasani and Song (2011).