The Impact of Dodd-Frank Regulation of OTC Derivative Markets and the Volker Rule on International Versus US Banks: New Evidence

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Abstract

This paper examines the impact of Dodd-Frank regulation of OTC Derivative Markets and the Volker Rule on the equity prices of international versus US banks. We analyze the hypothesis that new regulation in the US will have a negative effect on bank profits, and more importantly, that this impact is relatively more severe for US-based banks than those domiciled abroad. Event studies are conducted to test for abnormal returns around announcements pertaining to the new regulatory measures introduced under Dodd-Frank that differentially affect foreign banks relative to US banks, including announcements pertaining to OTC derivatives and the Volcker Rule. Our novel sampling method for international banks better isolates the group to whom new regulations in the US will actually apply, and thus should allow for a more meaningful comparison of the relative market valuations of new regulatory events between US and international firms. We find that both international and US banks react more significantly (and negatively) to events that outline with some precision the specific measures by which regulatory intent will be implemented. We estimate differential market losses to US banks relative to international banks of about $14.3 billion across all of the Dodd-Frank related events studied. These results lend credence to the argument that Dodd-Frank imposes costly restrictions on US banks that are circumvented by international banks.

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1. Introduction

In the wake of what has been labeled "the largest financial shock since the Great Depression,"(International Monetary Fund, 2008) policymakers in the US responded to widespread calls for regulatory reform to address perceived supervisory deficiencies with the *Dodd-Frank Wall Street Reform and Consumer Protection Act* (Dodd-Frank). Dodd-Frank incorporates 235 rulemaking projects involving 16 regulatory agencies represents the largest regulatory mandate since the Great Depression. From the earliest proposals outlining what would eventually become Dodd-Frank, opponents have argued that the proposed regulation would involve an overly burdensome cost of compliance, and would harm U.S. bank competitiveness relative to their foreign counterparts (North (2011)).[1]

Since the implementation of Dodd-Frank is an ongoing process, published research on the market reaction to Dodd-Frank specific regulatory events is sparse. To our knowledge no one to date has specifically examined the market reaction to the effects of the legislation on international banks with assets in the US. This paper provides new evidence on this score, focusing on the market reaction to key Dodd-Frank announcement dates, as they differentially affect US-based banks vs. international banks with US operations. Our selection of events allows for some speculation on the varying impacts of both the slow, piecemeal implementation process of Dodd-Frank, and types of announcements made. We find that both international and US firms react more significantly (and negatively) to events that outline with some precision the specific measures by which regulatory intent will be implemented. Our results also suggest that US banks shareholders are more adversely affected by Dodd-Frank related events than

[1] Other criticisms have focused on the issue that Dodd-Frank does not address the underlying conflicts in due diligence that are the source of the crisis (e.g. Kane (2012)).

international bank shareholders. These results lend credence to the argument that Dodd-Frank imposes additional restrictions to US banks to which international banks are immune.

The remainder of the paper is organized as follows: The next section provides background information on the components of Dodd-Frank that are the focus of our empirical analysis, including selected event dates. A brief review of the extant literature is provided in section 3. Section 4 provides a description of the data. The empirical results are found in section 5. The paper concludes with a summary in section 6.

2. Background on Dodd-Frank

The first proposal of what would eventually become Dodd-Frank emanated from the President Obama's proclamation for a "sweeping overhaul of the United States financial regulatory system…on a scale not seen since the Great Depression." (Obama, 2009) By the time the bill was signed into law on July 21, 2010 it had grown in length to almost 2400 pages, more than twice the length of the Securities Act of 1933, the Securities Exchange Act of 1934 and Sarbanes-Oxley combined (Boggs et al. (2011). The act is structured such that there are sixteen titles, each with a different regulatory objective, or area of supervision. The core purpose of these sixteen titles is to "address the systematic weaknesses of our financial system" (Casey, 2011). While Dodd-Frank as a whole has been criticized for its length, complexity, and the associated burdens of compliance, no two areas have received quite as much attention, nor as much opposition, as efforts to increase the supervision of over-the-counter (OTC) derivatives, and the Volcker Rule.

Under the previous regulatory framework for American derivatives markets established by the Commodity Futures Modernization Act (CFMA), the CFTC and SEC were expressly prohibited from regulating the OTC markets (SEC, 2012). Title VII of Dodd-Frank addresses this by dividing regulatory/supervisory duties between the CFTC and SEC, depending on the type of asset underlying the derivative (commodity versus security) thereby giving these agencies sweeping authority to create rules addressing areas such as capital requirements, reporting, and most importantly, central clearing (SEC, 2012). One report by Fitch Ratings (2012) states that they expect "broader regulation of swaps market participants and dealers to drive costs higher over the next few years" and that "in addition, increased collateral requirements will likely constrain systemic liquidity, absent any other changes".

The Volcker Rule is included under title VI of the act, with the intention that; "banks will no longer be allowed to own, invest, or sponsor hedge funds, private equity funds, or proprietary trading operations for their own profit, unrelated to serving their customers." (Obama (2010)). While seen by many as a crucial step towards reducing a key source of systematic risk in the financial system, the final version of the rule was widely considered overly convoluted, with the rule's namesake Paul Volcker stating; "it's much more complicated than I would like to see" (Reuters Regulatory News, 2011).

2.1 The Selected Events

Although the extremely wide scope of Dodd-Frank allows for the exploration of an equally wide variety of event types, for the purposes of this study we limited our

selection to five key announcement dates that do not coincide with any other major regulatory announcements[2], any major firm-specific, or industry specific announcements.

Dodd-Frank follows the standard procedure in the development of US financial regulation in that its promulgation rests with politicians, while its implementation is the responsibility of the regulatory agencies mandated by the legislation itself (Fullenkamp and Sharma (2012)). As a result one must draw a distinction between regulatory events relating to Dodd-Frank, which we will refer to as "mandates", i.e. those which specify what regulatory deficiency is to be addressed and by whom, versus "implementation" related events which specify actions which will be taken, or specify measures to be included in rules enforced by regulators.

Our first event occurs on ***August 11, 2009***, when the Treasury formally submitted to Congress, a "Proposed OTC Derivatives Act" which, called for central clearing and more strict oversight of OTC markets through stricter recordkeeping and data-reporting requirements. In addition, the Treasury proposal outlined the need for greater capital and margin requirements for OTC market participants, with the intention of increasing the overall stability of the financial system. This event represents an important moment in defining the shape of OTC legislation, and was the basis for much of what would later become the OTC portion of HR 4173 (the House version of what would later become Dodd-Frank).

This proposal was highly implementation-related, and provided financial institutions around the world a foretaste of forthcoming OTC regulation, and the

[2] One official date, October 12, 2011 follows immediately after several significant bank-related events in Asia and Europe. More information is provided later in section 2.1.

concomitant compliance costs. Given the latter, we hypothesize negative abnormal returns for both the international and US samples for this event date.

The second selected event occurs on ***June 25, 2010*** with the completion of the reconciliation of the House and Senate versions of the bill. By the afternoon of the 25th an outline of the final version of Dodd-Frank was released to the public. The implementation of the Act was widely expected to have a negative impact on the operation of many financial institutions. However, the impact of the announcement on domestic and international bank share prices might be expected to be somewhat muted, given the advanced scrutiny of market participants of the House and Senate proposals. Furthermore, many components of the reconciled version of the bill were considered as *favorable news*, since they were less harsh than initially proposed in the original House and Senate versions (Paletta, 2010.) Given the latter, we postulate a positive response to this event.

Our third selected event is the leak of a memorandum containing a draft of the Volcker Rule, ahead of the scheduled (October 11) FDIC conference in the evening of ***October 5, 2011*** (McGrane and Patterson, 2011). The Volcker Rule prohibits banks or institutions that own banks from engaging in proprietary trading on their own account – i.e. trading that that is not at the behest of clients. Furthermore, banks are proscribed from, owning or investing in hedge funds or private equity funds. The largest banks are also limited in the extent of the liabilities they can hold. These proscriptions apply only to banks that fall under the purview of US regulators. This would include US banks and foreign banking organizations. The latter includes foreign banks and their parent organizations that maintain branches or agencies in the U.S. or that own U.S. banks or

commercial lending companies in the United States. To the extent that these banks are capable of divesting their US assets to avoid the regulatory constraints, they may have a "competitive advantage" relative to their US counterparts (Onaran, 2012). Their revenue generation and risk management opportunity sets will be enhanced at the expense of the opportunity sets of US banks. We therefore hypothesize that the leak of the Volcker rule will result in negative abnormal returns for US banks, and positive abnormal returns for the international sample. The gains to foreign banks should be a function of their US presence. Banks with a smaller presence should have lower exit costs, and higher positive abnormal returns.

The October 5 event is a surprise that contains salient material information that was confirmed at the formal release date. In an efficient market, one might expect the market response to this event subsumes the effects of the formal release date announcement. We test this implication by including **October 12, 2011** as an event date. Although the conference itself was held on the 11th, it occurred after market close, thus any possible market response would have been delayed by at least one day. As stated above, given the fact that the contents of the proposed Volcker Rule had already circulated as a result of the leaked memorandum, we expect that this event will have insignificant market implications for our international sample. On the other hand, news stories relating a somewhat positive outlook for the implementation of the rule with regards to its impacts on the function of the US financial system would suggest positive news for US banks. We therefore expect positive returns for the US sample.

As was alluded to in the footnote on page four, the even date October 12, 2011 is contaminated by a few events which are highly important to our international sample.

Firstly, on the morning of October 11, 2011, it was announced by the Chinese government that they would begin purchasing stakes in the largest of the Chinese commercial banks in order to stabilize falling prices (Mackenzie (2011). Then, later in the afternoon, news sources began reporting that European leaders had given themselves a two week deadline to agree on a "comprehensive deal to tackle the Eurozone debt" (Spiegel (2011)). Finally, on the night of the 11th, reports began emerging that German finance minister Wolfgang Schäuble, and other representatives of the "Troika" were expecting losses in excess of 60 percent for some holders of Greek bonds (Evans-Pritchard (2011). The direct nature of the intervention by the Chinese government, couples with what could perhaps be relatively positive news for those banks with little exposure to the European sovereign crisis would suggest a strong positive effect for our Asian sample. Conversely however, continued uncertainty in Europe would likely have had the opposite effect, particularly considering the statements made by those with direct access to information on the condition of Greece's finances, and the high degree of exposure to those sovereigns on the part of most European banks.

The final event date that we examine is **April 27, 2012** when the CFTC and SEC jointly announced the rule defining the relevant market participants ("swap dealers" vs. "security-based swap dealer" vs. "major swap participants") whose OTC activities are subject to CFTC and SEC supervision and designates their registration, reporting, and margin requirements. Switzer and Fan (2007) note that the lack of transparency and oversight on bank OTC products could foster market manipulation, and price departures from fair value. Additionally, this is one of the first finalized rules that targets bank profit centers that had been previously protected from oversight. Hence, we hypothesize a

negative abnormal return for both the international and US samples for this event. The new oversight promulgated in the CFTC-SEC ruling should be expected to reduce banks' incentives to substitute OTC products with higher relative transactions costs relative to exchange traded products for their captive clients.

This legislative initiative to implement OTC supervision has been vigorously challenged by banks and their representatives throughout 2012. One could argue that the extremely slow, complex interagency process of financial rulemaking and implementation of Dodd-Frank should not reduce the impact of this event. On the contrary, it is may be more likely to exacerbate more general fears with regards to the supervision of OTC markets in the US, which may in turn enhance its effects.

Table 1 summarizes the event study dates, and their predicted market reactions.

[Please insert Table 1 about here]

3. Previous Work

A number of previous studies have examined the impact of regulatory events on the market valuations of financial institutions. In an early study, Eyssell and Arshadi (1990) consider the effects of new capital requirements under the 1988 Basel Accord. Wagster (1996) examines Basel I using event study methodology to ascertain the relative market valuation impacts of new bank capital requirements.

Schäfer, Schnabel and di Mauro (2012) investigate domestic market reactions to a variety of regulatory reforms including Dodd-Frank. Their sample focuses on the market reactions to "early" Dodd Frank events of US banks and a small sample (18) of European banks. Our study differs in two crucial ways. Firstly, we consider OTC derivative regulation events, including the landmark treasury proposal on August 11, 2009, which is

a key anticipatory date for Dodd-Frank. Additionally, we look at a much broader sample of both US and international banks that includes banks from all regions of the world with a presence in the US (described in section 5) providing for a more comprehensive investigation of the relative impacts of Dodd-Frank on US-based versus International banks.

4. Data and Methodology.

The US sample is the entire universe of firms classified as "banks" by the Bloomberg equity screener, with all those under a market capitalization of $500 Million removed. The result is a sample of 104 US-based financial institutions. Our sample of international institutions is obtained from the Federal Reserve Board (FRB) publication "Structure and Share Data for U.S. Banking Offices of Foreign Banking Organizations" (Federal Reserve Board, 2012.) We eliminate all non-bank institutions with less than $500 million in assets in the United States, and entities not present for at least four consecutive quarters after 2009, which leaves a sample of 98 institutions. We then remove banks for which trading is not continuous as well as those with market capitalization of less than $500 million USD as at the beginning of the period. This leaves us with a final sample of international banks of 88. The complete list of banks in our sample is provided in the appendices.

We make use of the classic event study methodology using the market model approach, with a 180 day estimation window that includes 119 days prior to the events and 60 days subsequent to the events to generate abnormal returns estimates. These estimates are also used to estimate the dollar value impact of each announcement on each

sample. Several alternative market proxies are used. The results are robust to the choice of index. The results that we report use the MSCI US broad based index for the US bank sample. For the international banks, we use the MSCI broad based world index.

Analyzing the differential international impact of Dodd-Frank requires special consideration of which international institutions will actually be affected by new regulations. The act specifies that US regulators will be allowed to supervise only the US activities of international institutions with assets based in the United States, and significant assets abroad. Conversely, however, the international activities of US institutions will also be restricted by many of the reforms included in Dodd-Frank, most notably The Volcker Rule, which bans proprietary trading by US institutions wherever their physical offices may be located. We would expect differential market reactions to the events for international banks that would depend on various factors, including their US presence, and other control variables which could proxy for their exit costs. We test for the importance of these factors in the cross-sectional regressions:

$$CARi(-1,1) = \alpha_0 + \alpha_1 USASSETS_i + \alpha_2 PROF_i + \alpha_3 SIZE + \alpha_4 MOM_{i_i} + \varepsilon_i$$

Where CAR_i (-1,1) is the cumulative abnormal return of i bank in the international sample for each event date in the (-1,+1) event window

$USASSETS_i$ is the percent of total assets held in the United States (the values of assets given by the FRB structure and share data divided by total assets) of international bank i

$PROF_i$ is the trading account profit (loss) divided by bank i's total assets – which may provide an indication of what may be at stake in the enforcement of the Volcker Rule;

$SIZE_i$ is the size (total assets) of bank i;

*MOM*i is the stock price momentum for bank i– computed as the stock price performance over the twelve months prior to the announcements; and

ε_i is a random error term.

Daily share prices for the banks as well as the benchmark market indices, MSCI US, MSCI World, and S&P/TSX indices are obtained from Bloomberg. All data used in the regressions described above are also obtained from Bloomberg. Descriptive statistics of both the international and US samples, as well as a list of banks included in each are provided in Table 2.

[Please insert Table 2 about here]

As is shown in Table 2, on average the International banks are larger and somewhat more profitable than their US counterparts, although there is considerable variation across regions. Asia/Pacific banks show the highest profit margins, followed by Canadian banks and Latin American banks. The lowest profitability is exhibited by European banks over this period.

5. Empirical Results

Table 3 and Table 4 provide the event study results for the US and International samples respectively. Relative market value impacts are shown in Table 5,

[Please insert Tables 3 to 5 about here]

Our first event date, the Treasury submission of the Proposed OTC Derivatives Act which outlined new measures to regulate OTC derivatives, has negative cumulative average abnormal returns (CAARs) over the entire observed window, with significant

results (at an alpha of 0.05) for both International and US samples over the period of 0, +1. This result is consistent with our hypothesis, and suggests that markets had not anticipated the full range of regulatory measures that were recommended by the Treasury report, that would adversely affect shareholder returns for both US banks and International banks with a US presence.

Our second event date, the passage of Dodd-Frank by committee (the reconciliation process between House and Senate versions of the bill) has positive, significant CAARs for the US sample; positive, non-significant CAARs are observed for the international sample. These results are broadly consistent with our hypothesis. Many components of the reconciled version of the bill were considered as good news, since they were less harsh than initially proposed in the original House and Senate versions. .As a mandate-type event, the reconciliation of Dodd-Frank itself does not provide any further information on the actual implementation process of the regulation; rather it provides the directive for the appropriate regulatory agencies to pursue rule-making activities, which will pursue the intent of the legislation. As a result, and considering the extreme length and complexity of the bill itself, it is reasonable to assume that a) the contents of the bill were viewed not surprising to the market, which would explain the insignificance of the market reaction of the international sample and b) that the elimination of some harsh components of the legislation was considered a positive event for US banks.

The third event date, the leakage of the Volcker rule draft showed results consistent with our hypothesis. As is shown in Table 3 strongly negative and statistically significant market reaction is shown for US banks (CAAR of -4.00%, Z-stat -16.07 over

the (-1,1) interval, and a positive and statistically significant reaction is shown for international banks (CAAR of 1.81%, Z-stat of 4.7516 over the (-1,1) interval. As is shown in Table 4, these results are economically significant as well. Abnormal Losses (gains) to US (international) bank shareholders exceed $25 ($42 billion).The provisions of the Volcker rule that regulators cannot fully enforce on foreign banks are given considerable value on the market, suggesting that their revenue generation and risk management opportunity sets expand at the expense of the opportunity sets of US banks. This is consistent with regulatory arbitrage, where banks can transfer funds between jurisdictions to reduce their "regulatory tax" (Houston, Lin, and Ma (2012)).

The official FDIC conference to release the already-leaked Volcker rule also shows results largely consistent with our hypotheses. The US sample has a positive CAAR of +0.39% over days (-1,+1) with a Z statistic of 1.5598, which while not extremely significant supports the assertion that initial abnormal loss in market value was, given further articulation of the rule by regulators, excessive. The International sample also displays the expected behavior over the window (-1,+1) with an insignificant CAAR of -0.0856% and Z statistic of 0.0059. While the anticipatory window (-1,0) suggests a negative impact on the international sample, this return is likely more of a result of several non-Dodd-Frank related events which occurred early in the European trading session on October 11 (see section 2.1 for more detail).

Our final event date the joint SEC-CFTC announcement regarding which OTC market participants would be subject to their purview. Again, this is one of the first finalized rules that targets bank profit centers that had been previously protected from oversight. The increase of transparency and oversight on such profit centres could

discourage market manipulation. In addition, such oversight might reduce banks' incentives to substitute OTC products with higher relative transactions costs relative to exchange traded products for their captive clients. Our results are consistent with the hypothesis that the new SEC-CFTC oversight will be harmful to bank profitability. For the US banks, the CAAR over the interval (-1,+1) is -1.08% with a Z statistic of -5.0449. For the international banks, the CAAR over the interval (-1,+1) is -0.9374 with a Z statistic of-3.8132. Abnormal Losses to US (international) bank shareholders exceed $29 ($25 billion).

While the rule did not finalize definitions of the products that would be regulated, it is important in that it is one of the first finalized rules specifying those who would experience greater regulatory scrutiny in OTC markets.

This legislative initiative to implement OTC supervision has been vigorously challenged by banks and their representatives throughout 2012. We hypothesize a negative abnormal return for both the international and US samples for this event. One could argue that the extremely slow, complex interagency process of financial rulemaking and implementation of Dodd-Frank should not reduce the impact of this event. On the contrary, it is may be more likely to exacerbate more general fears with regards to the supervision of OTC markets in the US, which may in turn enhance its effects.

On the whole, the Dodd-Frank events had a significant negative impact on the shareholders of both US and international Banks. Our results support the view that Dodd-Frank imposes costly restrictions on US banks that can be circumvented by international banks. Across all of the events, based on the (-1,1) window, we estimate

differential market losses to US banks relative to international banks of about $14.3 billion across all of the Dodd-Frank related events studied.

Of course not all international banks experience the same market reactions to the Dodd –Frank events. In Appendix B, we provide the results for these events broken down by region. In contrast to the European and Asia/Pacific banks, none of the Dodd-Frank events are significant for the Canadian banks or South American banks.

Table 6, below, includes the results of the cross-sectional factor analysis described in section 2.1.

[Please insert Table 6 about here]

Firm size and trading activity are found to be statistically insignificant in every regression, while momentum has mixed effects. On the other hand, the percent of the bank's assets located in the US is significant in most of the regressions. This result underscores the case that the regulatory constraints of Dodd Frank are not the same for all international banks with operations in the US, and that limiting their presence in the US reduces its regulatory burden.

6. Summary & Conclusions

Using the classic event study methodology, we find that Dodd Frank regulation of OTC markets has a negative effect on bank shareholders, with a greater burden shown for US based banks, and for international banks with a greater presence in the US.

The Volcker Rule is shown to have the largest negative impact on US banks, amounting to about $22 billion net of the positive reaction to the official announcement date. On the other hand, foreign banks experienced a significant gain, perhaps reflecting the fact that regulators cannot fully enforce the Volcker Rule on foreign banks, and that international

banks that can circumvent its provisions experience an expansion of their revenue generation and risk management opportunity sets at the expense of the opportunity sets of US banks. This result may substantiate US firms' complaints that the absence of similar legislation abroad creates a competitive disadvantage for US firms. As Dodd-Frank has transitioned from the legislative battleground of Congress to the legal battlegrounds of the American judicial system, the implementation of the individual provisions of the bill has been piecemeal and heavily delayed. Consequently, this process should provide for a wealth of future research into the impacts of Dodd-Frank on both international and American financial institutions.

References

Boggs, J.C., Foxman, M., and K. Nahill (2011). "Dodd-Frank at One Year: Growing Pai*ns*, *Harvard. Business Law Review* 52, http://www.hblr.org/?p=1614.

Casey, K. L. (2011). "The Regulatory Implementation and Implications of Dodd-Frank". Directors' Forum 2011. February 4, San Diego.

Evans-Pritchard, A. (2011). "German Push for Greek default risks EMU-wide 'snowball'". http://www.telegraph.co.uk/finance/financialcrisis/8819195/German-push-for-Greek-default-risks-EMU-wide-snowball.html

Eyssell, T., and N. Arshadi (1990): "The Wealth Effects of the Risk-based Capital Requirement in Banking: The Evidence from the Capital Markets," *Journal of Banking and Finance*, 14(1), 179–197.

Fama, F., Fisher, L, Jensen, Michael C., & Roll, R. (1969). "The Adjustment of Stock Prices to New Information." *International Economic Review* Vol. 10, 1-21.

Federal Reserve Board. (2012). Structure Data for the U.S. Offices of Foreign Banking Organizations. New York. Web. <http://www.federalreserve.gov/releases/iba/>.

Fitch Ratings. (2012). "Rising Costs, Regulation Altering Derivatives Landscape." N.p. < http://www.fitchratings.com/web/en/dynamic/articles/Rising-Costs-Regulation-Altering-Derivatives-Landscape.jsp>

Fullenkamp, Connel. Sharma, Sunil. (2012). “Good Financial Regulation: Changing the Process is Crucial. IMF.

Houston, J., Lin, C, and Y. Ma (2012). “Regulatory Arbitrage and International Bank Flows, *Journal of Finance* 67, pp. 1845-1895.

International Monetary Fund. (2008). *World Economic Outlook*. Washington DC.

Kane, E.J. (2012) “Missing elements in US financial reform: A Kübler-Ross interpretation of the inadequacy of the Dodd-Frank Act,” *Journal of Banking and Finance* 36, 654-661.

Mackenzie, K. (2011). “Beijing Intervenes to Help Stabilize Banks.” Financial Times. http://ftalphaville.ft.com/2011/10/11/698336/beijing-intervenes-to-help-stabilise-banks-2.

Mattingly, P. (2011). “Republicans Would ‘Remedy’ Unwanted Dodd-Frank Effects.” Bloomberg. http://www.bloomberg.com/news/print/2011-02-01/house-panel-to-remedy-dodd-frank-s-unintended-consequences-draft-shows.html.

Paletta, D. (2010). “It Has a Name: The Dodd/Frank Act.” *Wall Street Journal*, June 25, http://blogs.wsj.com/washwire/2010/06/25/it-has-a-name-the-doddfrankact/
_____, “Negotiators Ease Finance Rules,” http://online.wsj.com/article/SB10001424052748704629804575324650385926076.html.

Patterson, S. and V. McGrane (2011) “Volcker Rule May Lose Its Bite,” *Wall Street Journal*, Sept. 22.

North, C. (2011): *How Foreign Banks Are Regulated Under Dodd-Frank.* Bloomberg Government.

Obama, B. (2009): *Remarks by the President on 21st Century Financial Regulatory Reform.* White House Briefing Room, June 17. Washington DC.

Obama, B. (2010): *Remarks by the President on Financial Reform.* White House. Washington DC.

Onaran, Y. (2012): *Bank Lobby Widened Volcker Rule, Inciting Foreign Outrage. Bloomberg*. <http://www.bloomberg.com/news/2012-02-23/banks-lobbied-to-widen-volcker-rule-before-inciting-foreigners-against-law.html>.

Patterson, S., & McGrange, V. (2011): The Multibillion-Dollar Leak. *The Wall Street Journal*. October 7, New York.

Reuters Regulatory News. (2011): Thompson Reuters. Accessed 10 October 2012 <http://www.reuters.com/article/2011/11/09/us-regulation-volcker>

Schäfer, A., Schnabel, I., di Mauro, B. (2012). “How Have Markets Reacted to Financial Sector Reforms? An Event Study Analysis.” Working paper.

SEC. (2012). “Dodd-Frank Rulemaking: Derivatives.” U.S. Securities and Exchange Commission, Accessed 19 Oct 2012. <http://www.sec.gov/spotlight/dodd-frank/derivatives.shtml>.

SIFMA. (2012). *Dodd-Frank Rulemaking Resource Center.* Securities Industry and Financial Markets Association. http://www.sifma.org/issues/regulatory-reform/dodd-frank-rulemaking/overview/

Spiegel, P. (2011). “EU Sets Deadline to Resolve Debt Crisis.” Financial Times. http://www.ft.com/intl/cms/s/0/8356eb1a-f340-11e0-8383-00144feab49a.html#axzz2HQloJ0p2.

Switzer, L.N. and H. Fan (2007). “Volume-Volatility Interactions between Exchange Traded Derivatives and OTC Derivatives,” *Review of Futures Markets* 16, 171-196.

Wagster, J. D. (1996). “Impact of the 1988 Basle Accord on International Banks.” Journal *of Finance*, 51: 1321–1346.

Table 1
Event Summary & Market Reaction Hypotheses

Date	Event & (Type)	Predicted Abnormal Return
11 August 2009	Treasury submits specific legislative proposal to congress regarding OTC derivatives (Implementation)	US – Negative International - Negative
25 June 2010	Dodd Frank Passes Conference Committee (Mandate)	US – Negative International – Insignificant
6 October 2011	Private Volcker Rule Memorandum Leaked (Implementation)	US – Negative International - Positive
12 October 2011	Official Volcker Rule release and press conference (Implementation)	US – Positive International – Positive
27 April 2012	Final Rule Regarding Further Definitions of "swap dealer", "security-based swap dealer" and "major swap participant" released by the CFTC and SEC (Implementation)	US – Negative International - Negative

Table 2
Bank Sample Descriptive Statistics[1]

United States					
	N	Minimum	Maximum	Mean	Std Dev.
Market Cap	104	280.67	145037.58	6549.68	21193.28
Net Revenue[2]	104	73.01	97234.00	4523.28	16972.35
Profit Margin (%)	104	-80.22	46.03	16.19	16.20
International					
	N	Minimum	Maximum	Mean	Std Dev.
Market Cap	88	374.88	228194.64	28421.19	37319.97
Net Revenue	88	-5626.72	77688.02	16298.39	20190.58
Profit Margin (%)	88	-161.90	92.91	19.75	36.18
Asia/Pacific					
	N	Minimum	Maximum	Mean	Std Dev.
Market Cap	40	767.77	228194.64	31854.45	47676.31
Net Revenue	40	175.94	73902.11	11806.76	17739.57
Profit Margin (%)	40	13.39	92.91	37.18	19.99
Canada					
	N	Minimum	Maximum	Mean	Std Dev.
Market Cap	6	11472.36	70271.08	45915.81	23335.17
Net Revenue	6	4655.01	24400.29	15799.03	7117.23
Profit Margin (%)	6	20.16	29.93	25.45	3.32
Europe					
	N	Minimum	Maximum	Mean	Std Dev.
Market Cap	34	374.88	136077.89	23494.84	26405.25
Net Revenue	34	-5626.72	77688.02	22787.41	23695.33
Profit Margin (%)[3]	34	-161.90	48.90	-2.16	46.87
Latin America					
	N	Minimum	Maximum	Mean	Std Dev.
Market Cap	5	5799.21	63005.75	24855.84	24668.98
Net Revenue	5	1917.22	45236.44	16966.95	20008.02
Profit Margin (%)	5	15.89	33.42	22.89	7.41
Unclassified[4]					
	N	Minimum	Maximum	Mean	Std Dev.
Market Cap	3	5913.24	15798.92	10343.89	5021.82
Net Revenue	3	1378.02	1920.47	1693.58	281.88
Profit Margin (%)	3	21.20	57.00	41.77	18.49

[1]All figures presented here are as of year end 2011, expressed in millions of USD unless otherwise noted
[2]Bloomberg calculates net revenue as the sum of interest income, trading account profits (losses), investment income (losses), commissions and fees earned, and other operating income, less interest expense.
[3]One extreme outlier data point was removed (a profit margin of less than -500%), changing the mean from -17.76 to the value above
[4]Because of alignment issues of return data due to differing operating hours of national exchanges, and the small sample size of banks not falling into the given regions, regional abnormal return analysis was not performed

Table 3

US Sample Cumulative Average Abnormal Returns[1]

Event Range	CAAR (%)	Z[2]	Mdn (%)	Proportion Negative
August 11, 2009				
-1,+1	-0.7519	-1.3890	-0.7308	0.5962
0,+1	-2.4955	-5.2158**	-2.1350	0.8558
June 25, 2010				
-1,+1	2.5344	8.6244**	2.6528	0.0962
0,+1	1.9820	7.7725**	1.8229	0.125
October 6, 2011				
-1,+1	-4.0000	-16.0725**	-4.2491	0.9038
0,+1	-2.3813	-12.6778**	-2.5694	0.8846
October 12, 2011				
-1,+1	0.4210	1.2786	0.3082	0.4135
0,+1	-0.3806	-2.2021*	-0.4465	0.5865
April 27, 2012				
-1,+1	-1.0815	-5.0449**	-1.2040	0.7596
0,+1	-0.4872	-2.9587**	-0.6100	0.7115

[1]the CAAR is defined as the average of all cumulative daily abnormal return over the defined event ranges, where returns for each day are as defined as $R_t = \alpha_i + \beta_i R_M + \gamma_t D_t + \hat{\varepsilon}_i$ with R_t the total return, equal to the α_i of each individual security, plus the individual beta (β_i) multiplied by the return on the MSCI US Broad-Base Index (R_M). The abnormal return for each day in the event range is captured by the coefficient γ_t of the binary variable D_t, which equals 1 during an event, and 0 otherwise.

[2]*p < 0.1, **p < 0.05

Table 4

International Sample Cumulative Average Abnormal Returns[a]

Event Range	CAAR (%)	Z[b]	Mdn (%)	Proportion Negative
August 11, 2009				
-1,+1	-0.9996	-1.8959*	-0.8560	0.5909
0,+1	-1.1330	-2.2743**	-0.7520	0.6364
June 25, 2010				
-1,+1	0.3835	1.0285	0.2440	0.4423
0,+1	0.4175	1.6171	0.1390	0.4904
October 6, 2011				
-1,+1	1.8125	4.7516**	1.1970	0.3654
0,+1	1.5958	5.1824**	0.3450	0.4712
October 12, 2011				
-1,+1	1.3309	4.3308**	1.0207	0.3636
0,+1	0.4450	1.3218	0.1269	0.4659
April 27, 2012				
-1,+1	-0.9374	-3.8132**	-0.0932	0.5288
0,+1	0.1460	-0.0414	0.3460	0.3942

[a]the CAAR is defined as the average of all cumulative daily abnormal return over the defined event ranges, where returns for each day are as defined as $R_t = \alpha_i + \beta_i R_M + \gamma_t D_t + \hat{\varepsilon}_i$ with R_t the total return, equal to the α_i of each individual security, plus the individual beta (β_i) multiplied by the return on the MSCI World Index (R_M). The abnormal return for each day in the event range is captured by the coefficient γ_t of the binary variable D_t , which equals 1 during an event, and 0 otherwise.

[b]*p < 0.1, **p < 0.05

Table 5

Total Market Value Impacts[1]

Event Range		International Total Value Impact[2]	US Total Value Impact[3]	Differential Value Impact (US versus International)[4]
August 11, 2009				
	-1,+1	-26746.71	-5305.12	21441.59
	0,+1	-30223.50	-17378.67	12844.83
June 25, 2010				
	-1,+1	10152.21	21332.85	11180.64
	0,+1	11051.30	16812.43	5761.13
October 6, 2011				
	-1,+1	42323.79	-25132.52	-67456.31
	0,+1	37734.65	-15073.12	-52807.77
October 12, 2011				
	-1,+1	-2174.37	2453.63	4628.00
	0,+1	4496.57	3802.31	-694.26
April 27, 2012				
	-1,0	-22535.64	-710.38	21825.26
	-1,+1	-25155.32	-9250.03	15905.29

[1]All figures presented here are expressed in millions of USD unless otherwise specified

[2]Calculated as: $\sum_{i=1}^{I} CAR(t1,t2)_i * MKTCAP_{i,t1-1}$ for international banks i over the interval t1,t2, where CARi is the cumulative abnormal return for bank i, and MKTCAPi is the market cap of international bank i

[3] Calculated as: $\sum_{j=1}^{J} CAR(t1,t2)_j * MKTCAP_{j,t1-1}$ for US bank j over the interval t1,t2, where CARj is the cumulative abnormal return for US bank j, and MKTCAPj is the market cap of US bank j.

[4]US Total Value Impact – International Total Value Impact

Table 6

Abnormal Return Determinants for the International Bank Sample

This table shows the results of the regression:

$$CARi(-1,1) = \alpha_0 + \alpha_1 USASSETS_i + \alpha_2 PROF_i + \alpha_3 SIZE + \alpha_4 MOM_{i_i} + \varepsilon_i$$

Where CAR_i (-1,1) is the cumulative abnormal return of i bank in the international sample for each event date in the (-1,+1) event window

$USASSETS_i$ is the percent of total assets held in the United States (the values of assets given by the FRB structure and share data divided by total assets) of international bank i

$PROF_i$ is the trading account profit (loss) divided by bank i's total assets – which may provide an indication of what may be at stake in the enforcement of the Volcker Rule;

$SIZE_i$ is the size (total assets) of bank i;

MOMi is the stock price momentum for bank i– computed as the stock price performance over the twelve months prior to the announcements; and

ε_i is a random error term.

Event	Constant	Size	US Assets	Momentum	Trading Activity	Adj R^2	F-Stat (p-value)	N^2
August 11, 2009	-0.00226	0.000	-0.05638**	-0.0000913*		0.10	4.15	88
	(-1.30)	(0.54)	(-2.85)	(-1.91)			(0.009)	
	-0.00238	0.000	-0.04874**	-0.000118**	-0.1482	0.09	3.07	83
	(-1.31)	(0.23)	(-2.38)	(-2.21)	(-0.53)		(0.021)	
June 25, 2010	0.00327**	-0.000	-001205	0.00000248		0.00	0.68	88
	(2.11)	(-1.07)	(-0.83)	(0.09)			(0.568)	
	0.002899*	-0.000	-0.01181	0.00000263	0.0665	0.00	0.43	85
	(1.77)	(-0.92)	(-0.78)	(0.09)	(0.28)		(0.789)	
October 6, 2011	0.012063**	0.000	-0.03735	0.00013618*		0.02	1.60	88
	(4.36)	(0.12)	(-1.53)	(1.72)			(0.195)	
	0.011087**	0.000	-0.04394*	0.0001428*	0.3261	0.02	1.50	85
	(3.53)	(0.32)	(1.78)	(1.78)	(0.54)		(0.209)	
April 27, 2012	0.002109	-0.000	-0.02743	0.00003940		0.00	1.06	88
	(1.11)	(-0.67)	(-1.35)	(0.80)			(0.371)	
	0.004445*	-0.000	-0.03086	0.00008316	-0.5908	0.02	1.37	84
	(1.88)	(-0.77)	(-1.48)	(1.44)	(-1.33)		(0.252)	
All Dates	0.003027**	-0.000	-0.02965**	-0.00000151		0.01	2.70	352
	(3.12)	(-0.42)	(-2.78)	(-0.07)			(0.046)	
	0.002878**	-0.000	-0.02944**	-0.00000608	0.1003	0.01	2.06	337
	(2.80)	(-0.41)	(-2.71)	(-0.27)	(0.55)		(0.086)	

*p<0.1, **p<0.05

Appendix A
Bank Sample Information

Table 6
International Bank Sample Constituent List

Region	Country	Bank Name
Asia/Pacific		
	AUSTRALIA	Commonwealth Bank of Australia
		Westpac Banking Corp
		Australia & New Zealand Banking Group
		National Australia Bank Ltd
	CHINA	Industrial & Commercial Bank of China
		China Construction Bank Corp
		Bank of China Ltd
		Bank of Communications Co Ltd
		China Merchants Bank Co Ltd
	HONG KONG	Bank of East Asia Ltd
		Chong Hing Bank Ltd
	INDIA	State Bank of India
		ICICI Bank Ltd
		Bank of Baroda
		Bank of India
		Andhra Bank
	JAPAN	Mitsubishi UFJ Financial Group
		Sumitomo Mitsui Financial Group
		Mizuho Financial Group Inc
		Shinkin Central Bank
		Shizuoka Bank Ltd
		Aozora Bank Ltd
	MALAYSIA	Malayan Banking Bhd
	PHILIPPINES	Metropolitan Bank & Trust
		Philippine National Bank
	SINGAPORE	DBS Group Holdings Ltd
		Oversea-Chinese Banking Corp Ltd
		United Overseas Bank Ltd
	SOUTH KOREA	Shinhan Financial Group Co Ltd
		Woori Finance Holdings Co Ltd
		Hana Financial Group Inc
		Industrial Bank of Korea
	TAIWAN	Chinatrust Financial Holding C
		Chang Hwa Commercial Bank
		E.Sun Financial Holding Co Ltd
	THAILAND	Kasikornbank PCL
		Bangkok Bank PCL
		Krung Thai Bank PCL
	TURKEY	Turkiye Vakiflar Bankasi Tao
	PAKISTAN	National Bank Of Pakistan

Canada		
		Royal Bank of Canada
		Toronto-Dominion Bank/The
		Bank of Nova Scotia
		Bank of Montreal
		Canadian Imperial Bank of Commerce
		National Bank of Canada
Europe		
	BELGIUM	KBC Ancora
		Dexia SA
	BRITAIN	HSBC Holdings PLC
		Standard Chartered PLC
		Royal Bank of Scotland Group P
		Lloyds Banking Group PLC
		Barclays PLC
	FRANCE	BNP Paribas SA
		Societe Generale SA
		Credit Agricole SA
		Natixis
	GERMANY	Deutsche Bank AG
		Commerzbank AG
	GREECE	Piraeus Bank SA
	IRELAND	Allied Irish Banks PLC
	ISRAEL	Bank Hapoalim BM
		Bank Leumi Le-Israel BM
		Mizrahi Tefahot Bank Ltd
		Israel Discount Bank Ltd
	ITALY	Intesa Sanpaolo SpA
		UniCredit SpA
		Banca Monte dei Paschi di Sien
	SPAIN	Banco Santander SA
		CaixaBank
		Banco de Sabadell SA
		Banco Popular Espanol SA
	SWEDEN	Nordea Bank AB
		Svenska Handelsbanken AB
		Swedbank AB
	SWITZERLAND	UBS AG
		Credit Suisse Group AG
	NORWAY	DNB ASA
	NETHERLANDS	ING Groep NV
	PORTUGAL	Banco Espirito Santo SA
South America		
	BRAZIL	Banco Bradesco SA
		Banco do Brasil SA
	CHILE	Banco de Chile
	COLOMBIA	Banco de Bogota SA
	PERU	Banco de Credito del Peru
Unclassified		

JORDAN	Arab Bank PLC
KUWAIT	National Bank of Kuwait
SAUDI ARABIA	Riyad Bank

Table 7
US Bank Sample Constituent List

1st Source Corp	Investors Bancorp Inc
Associated Banc-Corp	JPMorgan Chase & Co
Astoria Financial Corp	Kearny Financial Corp
Bancfirst Corp	KeyCorp
BancorpSouth Inc	M&T Bank Corp
Bank of America Corp	MB Financial Inc
Bank of Hawaii Corp	National Penn Bancshares Inc
Bank of the Ozarks Inc	NBT Bancorp Inc
BB&T Corp	New York Community Bancorp Inc
BBCN Bancorp Inc	Northfield Bancorp Inc/NJ
Beneficial Mutual Bancorp Inc	Northwest Bancshares Inc
Berkshire Hills Bancorp Inc	Old National Bancorp/IN
BOK Financial Corp	Oritani Financial Corp
Boston Private Financial Holdi	Pacific Capital Bancorp
Brookline Bancorp Inc	PacWest Bancorp
CapitalSource Inc	Park National Corp
Capitol Federal Financial Inc	People's United Financial Inc
Cathay General Bancorp	Pinnacle Financial Partners In
Central Pacific Financial Corp	PNC Financial Services Group I
Chemical Financial Corp	PrivateBancorp Inc
Citigroup Inc	Prosperity Bancshares Inc
Citizens Republic Bancorp Inc	Provident Financial Services I
City Holding Co	Regions Financial Corp
City National Corp/CA	Republic Bancorp Inc/KY
Columbia Banking System Inc	S&T Bancorp Inc
Comerica Inc	SCBT Financial Corp
Commerce Bancshares Inc/MO	Signature Bank/New York NY
Community Bank System Inc	Sterling Financial Corp/WA
Community Trust Bancorp Inc	SunTrust Banks Inc
Cullen/Frost Bankers Inc	Susquehanna Bancshares Inc
CVB Financial Corp	SVB Financial Group
East West Bancorp Inc	Synovus Financial Corp
Fifth Third Bancorp	TCF Financial Corp
First Citizens BancShares Inc	Texas Capital Bancshares Inc
First Commonwealth Financial C	TFS Financial Corp
First Financial Bancorp	TrustCo Bank Corp NY
First Financial Bankshares Inc	Trustmark Corp
First Horizon National Corp	UMB Financial Corp
First Midwest Bancorp Inc/IL	Umpqua Holdings Corp
First Niagara Financial Group	United Bankshares Inc/WV
FirstMerit Corp	United Community Banks Inc/GA
Flagstar Bancorp Inc	US Bancorp

FNB Corp/PA	Valley National Bancorp
Fulton Financial Corp	ViewPoint Financial Group Inc
Glacier Bancorp Inc	Washington Federal Inc
Hancock Holding Co	Webster Financial Corp
Home BancShares Inc/AR	Wells Fargo & Co
Hudson City Bancorp Inc	WesBanco Inc
Huntington Bancshares Inc/OH	Westamerica Bancorporation
Iberiabank Corp	Western Alliance Bancorp
Independent Bank Corp/Rockland	Wintrust Financial Corp
International Bancshares Corp	Zions Bancorporation

Appendix B

Regional Breakdown of International Sample

Panel A. Asia/Pacific Sample

Event Range	CAAR (%)[1]	Z[2]	Mdn (%)	Proportion Negative
August 11, 2009				
-1,+1	-1.2226	-1.3349	-1.4090	0.5263
0,+1	-1.5433	-2.1231**	-1.7320	0.6842
June 25, 2010				
-1,+1	0.5050	1.3232	0.1710	0.4474
0,+1	0.2981	1.0122	-0.1990	0.5526
October 6, 2010				
-1,+1	4.0698	7.2492**	4.2790	0.2368
0,+1	4.8602	10.6056**	4.9930	0.1579
October 12, 2012				
-1,+1	3.7954	6.7223**	3.0319	0.1316
0,+1	1.8125	3.5294**	1.5365	0.2895
April 27, 2012				
-1,+1	0.9426	2.2555**	1.0250	0.3421
0,+1	0.7635	1.9827**	0.5030	0.3421

[1]the CAAR is defined as the average of all cumulative daily abnormal return over the defined event ranges, where returns for each day are as defined as $R_t = \alpha_i + \beta_i R_M + \gamma_t D_t + \hat{\varepsilon}_i$ with R_t the total return, equal to the α_i of each individual security, plus the individual beta (β_i) multiplied by the return on the MSCI World Index (R_M). The abnormal return for each day in the event range is captured by the coefficient γ_t of the binary variable D_t , which equals 1 during an event, and 0 otherwise.

*p < 0.1, **p < 0.05

Panel B. Canadian Sample

Event Range	CAAR (%)[1]	Z[2]	Mdn (%)	Proportion Negative
August 11, 2009				
-1,+1	0.4401	0.4281	0.2940	0.4737
0,+1	0.4406	0.4262	0.1190	0.4474
June 25, 2010				
-1,+1	0.8018	0.7369	0.8350	0.3684
0,+1	0.7079	0.7155	0.3460	0.3158
October 6, 2010				
-1,+1	0.3780	0.13598	0.2940	0.4737
0,+1	0.4108	0.20004	0.1190	0.4474
October 12, 2011				
-1,+1	-0.8883	-0.7598	-0.7173	0.6176
0,+1	-0.3288	-0.5433	-0.7200	0.6765
April 27, 2012				
-1,+1	0.5039	0.2583	0.2940	0.4737
0,+1	0.5319	0.3837	0.1190	0.4211

[1]the CAAR is defined as the average of all cumulative daily abnormal return over the defined event ranges, where returns for each day are as defined as $R_t = \alpha_i + \beta_i R_M + \gamma_t D_t + \hat{\varepsilon}_i$ with R_t the total return, equal to the α_i of each individual security, plus the individual beta (β_i) multiplied by the return on the S&P/TSX Composite (R_M).The abnormal return for each day in the event range is captured by the coefficient γ_t of the binary variable D_t , which equals 1 during an event, and 0 otherwise.
*p < 0.1, **p < 0.05

Panel C. European Sample

Event Range	CAAR (%)[1]	Z[2]	Mdn (%)	Proportion Negative
August 11, 2009				
-1,+1	-0.6957	-0.5224	-0.8250	0.6176
0,+1	-0.8492	-0.5233	-0.3350	0.6176
June 25, 2010				
-1,+1	1.0808	2.1393**	1.1020	0.2368
0,+1	0.9842	2.5453**	0.9280	0.2895
October 6, 2010				
-1,+1	1.2657	2.2388**	2.3240	0.3421
0,+1	-0.2754	0.0330	-0.5880	0.5789
October 12, 2011				
-1,+1	-1.3595	-2.1931**	-1.5639	0.6765
0,+1	-1.003	-2.1988**	-1.3242	0.7647
April 27, 2012				
-1,+1	-0.8612	-1.7141*	-0.3170	0.5882
0,+1	1.0828	1.4634	0.5700	0.3529

[1]the CAAR is defined as the average of all cumulative daily abnormal return over the defined event ranges, where returns for each day are as defined as $R_t = \alpha_i + \beta_i R_M + \gamma_t D_t + \hat{\varepsilon}_i$ with R_t the total return, equal to the α_i of each individual security, plus the individual beta (β_i) multiplied by the return on the MSCI World Index (R_M).The abnormal return for each day in the event range is captured by the coefficient γ_t of the binary variable D_t , which equals 1 during an event, and 0 otherwise.
*p < 0.1, **p < 0.05

Panel D. South American Sample

Event Range	CAAR (%)[1]	Z[2]	Mdn (%)	Proportion Negative
August 11, 2009				
-1,+1	-0.4074	-0.3791	-0.1570	0.5263
0,+1	1.0179	0.6191	0.8320	0.3947
June 25, 2010				
-1,+1	-0.2681	-0.2854	-0.0136	0.5000
0,+1	1.0712	0.6541	0.6740	0.3684
October 6, 2011				
-1,+1	-0.3023	-0.3084	-0.0378	0.5000
0,+1	0.9785	0.5603	0.5280	0.3947
October 12, 2011				
-1,+1	-0.8408	-0.5933	-0.7173	0.6177
0,+1	-0.4305	-0.6187	-0.8358	0.7059
April 27, 2012				
-1,+1	-0.5197	-0.3735	-0.1460	0.5263
0,+1	1.2181	0.7571	0.9920	0.3158

[1]the CAAR is defined as the average of all cumulative daily abnormal return over the defined event ranges, where returns for each day are as defined as $R_t = \alpha_i + \beta_i R_M + \gamma_t D_t + \hat{\varepsilon}_i$ with R_t the total return, equal to the α_i of each individual security, plus the individual beta (β_i) multiplied by the return on the MSCI World Index (R_M).The abnormal return for each day in the event range is captured by the coefficient γ_t of the binary variable D_t , which equals 1 during an event, and 0 otherwise.

*p < 0.1, **p < 0.05