Banking Scandals and Long-Term Stock Price – An Event Study

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Abstract

This study aims to identify the effects of American bank scandal penalties on long-term stock price utilizing the Fama-French three-factor model and an event study methodology. We hypothesize that bank penalties have a profoundly negative role on long-term bank stock prices. We examine 145 penalties over 4,526 trading days for the 'Too Big to Fail' American banks JPMorgan Chase, Wells Fargo, Citigroup, and Bank of America. Adjusted closing price stock data and penalty data is drawn from an 18-year period spanning from 2000-2017. In the long-run, penalties were found to have no statistically significant impact on stock price, implying that 'Too Big to Fail' fail banks enjoy market capitalization benefits from their government designation.

KEYWORDS: (Bank Scandals, Event Study, Too Big to Fail)
JEL CODES: (G14, G18, G21)

ON MY HONOR, I HAVE NEITHER GIVEN NOR RECEIVED UNAUTHORIZED AID ON THIS THESIS

James Reohr

Signature

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I would like to thank Dan Johnson for helping me through my regressions and teaching me so much throughout this process. Thank you to my Mom and Dad for being there throughout my entire academic career.

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Introduction

In a capitalistic society, firms must approach their business plans with a 'survival of the fittest' mentality. Cutting-edge strategies in every sector are constantly refined to stay competitive. In an ideal world, all businesses would abide by the rules imposed upon them by federal institutions. The truth of the matter is that employees are constantly faced with ethical and legal dilemmas every day in the pursuit of profits. Public firms may cheat or cut corners to excel in their field. Common sense dictates that once these cheating public firms are exposed to shareholders and punished by governing bodies for their violations, both shareholder and federal penalties are consequential enough to put these firms back on the legal tracks. But are imposed fines and their subsequent effect on market capitalization enough to correct misbehavior? The financial services sector is an example of an industry where the largest and most influential firms consistently commit illicit acts to raise the bottom line. A study from the Federal Reserve Bank of New York reveals that governance within financial firms differs from non-financial firms due to their large number of shareholders and the constantly shifting complexity of the business. These factors combined with a risk-based deposit insurance system lead to an environment of bold risk-taking and high leverage (Mehran et. al, 2011). American banking is an intriguing arena for examining the effect of misbehavior on owner's equity due to the complexity and size of the industry.

Origin and Implications of 'Too Big to Fail'

As defined by Stern and Feldman (2009), too big to fail (TBTF) is "a term describing the receipt of discretionary government support by a bank's uninsured creditors who are not automatically entitled to government support" (Stern and Feldman, 2009). The phrase was initially used in 1980, when the Federal Deposit Insurance Corporation provided a distressed First Pennsylvania Bank with a capital injection to prevent potentially severe macroeconomic consequences. Since that precedent was set, banks have ballooned in size, with the top five largest bank holding companies by assets controlling over half of all U.S. bank assets in Q4 2011 (Stern and Feldman, 2009).

TBTF is a label that has caused controversy for decades and was recently thrust into the spotlight again. TBTF banking firms were put under public scrutiny for their integral role in causing the 2008 financial crisis and subsequent economic recession. Congress approved the $700 billion Troubled Asset Relief Program (TARP) in October 2008 to purchase distressed assets to keep banks solvent, but it instead provided banks mostly with capital injections. In fact, 89% of TARP's capital injections went to 32 of the largest U.S. financial firms by assets, while 11% went to another 675 smaller banks (Barth et al., 2012). In the current financial regulatory climate, there are certainly benefits to receiving the TBTF designation.

When TBTF banks are deemed insolvent, the market expects the government to intervene to a degree to settle with the bank's creditors. In essence, bankrupt TBTF firms will not fail in the same manner as other firms within the same industry. The TBTF designation is usually predicated on size and complexity of a firm within a given

industry. If such an integral TBTF firm were to declare bankruptcy within the natural course, there could be catastrophic ripple effects across the entire economy. It seems likely that this powerful federal guarantee and assistance would come with other benefits, and indeed it does. In an examination of TBTF banks, Kaufman finds that a TBTF designation causes a lack of market discipline and a reduction of the cost of capital relative to smaller peer banks. Additionally, Kaufman points to severe risk taking within TBTF banks because of their perceived federal guarantee against insolvency. These implications of TBTF policy and precedent in turn lead to a misallocation of resources and inefficiency within the financial industry (Kaufman, 2014). The allowance of greater risk-taking means that TBTF banks may take advantage of a perceived immunity to punitive forces in the market. With the knowledge that their stock price will not suffer if they are caught, banks may come out net-positive if they purposefully engage in illicit or unprescribed activities to gain a competitive advantage. This study will seek to answer the following questions: Does the market punish bank equities when a bank is penalized? If so, to what extent, and is there a difference in effect of punishment/sanctions when imposed by civil or criminal suits? What effect do imposed bank penalties have on bank stock price in the long run? We hypothesize that bank penalties have a profoundly negative role on long-term bank stock prices, with criminal suits having a greater effect than civil suits.

Literature Review

There are a few theories within the literature as to why firms commit fraud. Kuhn and Ashcraft (2003) point to three primary root causes that lead to fraud within a firm. The first explanation is around firm-specific structures that allow for an executive concentration of power to recklessly pursue short-term profits. The second explanation highlights the questionable character or motivations of individuals within a firm that has the potential to infiltrate the rest of the firm. The third rationale points to market capitalism as a source of pressure by which firms will artificially inflate their stock price (Kuhn and Ashcraft, 2003). Jensen points to the overvaluation of equity in corporations as a direct cause of corporate scandals. He finds that overvaluation sets in motion organizational forces that subsequently lead to fraud and the destruction of a firm's value (Jensen, 2004).

Existing literature reveals that scandalous behavior in corporations can lead to a variety of outcomes for both the firm and shareholders. Karpoff (2008) examines the legal and market penalties imposed on firms that engage in financial misrepresentation and finds that reputational penalties imposed by the market are greater than 7.5 times the sum of all legal and regulatory penalties in the short-run. These findings contradict conventional wisdom that financial misrepresentations are under-penalized, as market forces on reputation cause substantial losses for the firms in question. (Karpoff et. al, 2008). Jory (2015) finds that scandals linked to a firm's CEO adversely affect stock price and increase volatility in the short-run. In the long-run however, stock price is shown to readjust to the mean price. Operating performance of scandal-affected firms is stronger

than non-affected peer firms (Jory et. al, 2015). Jain et. al (2010) examines the effect of option backdating probe announcements on stock returns and finds negative abnormal stock returns for the 245 implicated companies. They also find that companies with greater stock price volatility, less effective corporate governance, and lower quality of financial statements experience an increasingly negative market reaction (Jain et. al, 2010). Such general market findings can be extrapolated to further examine the banking industry.

The banking sector presents unique characteristics of connectedness and firm size as they relate to stock price. Brewer et al. (2003) uses an event study methodology to examine the response in equity returns of Japanese banks to the failure of four commercial banks and two securities firms from 1995-1998. Their results reveal that the entire banking industry was negatively affected, although not all banks were affected equally, with shareholders of banks in poor financial standing experiencing greater negative effects (Brewer et. al, 2003). Chiezey and Onu (2013) look at the relationship between fraudulent activities on financial performance of Nigerian deposit banks from 2001-2011. They find that fraudulent activities inflict severe financial distress on deposit banks and in turn on their customers (Chiezy and Onu, 2013). O'Hara and Shaw examine the effect of the OCC's announcement that certain banks were deemed TBTF on stock price utilizing an event study methodology. Their findings indicate an increase in value for TBTF banks and a decrease in value for non-TBTF banks. They also found that the degree of positive and negative effects varies depending on the solvency and size of banks (O'Hara and Shaw, 1990). A cost-benefit analysis of TBTF banks utilizing economies of scale reveals that the increased systematic risk to the macro economy far

outweighs the merits of such a system (Boyd and Heitz, 2016). The literature is clear that size designation and wrongdoing can have an effect on financial performance of banks. This leaves a gap in the literature as to how scandals affect banks in the long-term.

Data

Stock price data for the four banks in the study is taken from Yahoo Finance. The time series is comprised of adjusted closing stock prices from 4,567 trading days over a span of eighteen years from 1/4/00 to 12/29/17. Data for the public release date of bank penalties is from Violation Tracker, a national database on corporate misconduct. Violation Tracker was created under the Corporate Research Project by Good Jobs First, a national policy research center in Washington, D.C. The public release of bank penalties is used as a proxy variable for all publicly-released information regarding illicit banking scandals. In total, there are 145 penalty events between the four banks from 2000 through 2017. If penalties were assessed on a non-trading day, then the event window was shifted to center on the trading day following that non-trading day. All penalties exceed $1,000,000 and are levied by federal agencies including the Department of Justice, the Office of the Comptroller of the Currency, the Federal Reserve, the Consumer Financial Protection Bureau, the Commodity Futures Trading Commission, the Securities Exchange Commission, the Equal Opportunity Employment Commission, Federal Energy Regulatory Commission, National Labor Relations Board, Federal Trade Commission, Office of Foreign Assets Control, and the U.S. Attorney's Office. Summary statistics for the penalty announcements are displayed below:

Table 1: Summary Statistics for Penalty Announcements

	Wells Fargo	JPMorgan Chase	Bank of America	Citigroup
Total Scandals	30	39	40	36
Civil Scandals	28	35	39	34
Criminal Scandals	2	4	1	2
Penalty Mean	$378,626,313	$698,607,296	$1,356,907,811	$448,057,341
Penalty Median	$25,427,500	$100,000,000	$33,000,000	$99,220,000
Standard Deviation	$1,030,743,871.63	$2,188,718,754.52	$3,628,695,542.85	$1,183,975,806.54

The penalty means of Wells Fargo, JPMorgan Chase, and Citigroup are all relatively close to one another at $378,626,313, $698,607,296, and $448,057,341, while the Bank of America penalty mean is much larger at $1,356,907,811. The penalty medians display a different version of centrality, with Wells Fargo and Bank of America on the lower end of penalty size at $25,427,500 and $33,000,000 while JPMorgan Chase and Citigroup on the higher end with $100,000,000 and $99,220,000 respectively. The means and medians reveal that the distribution of scandals for all four banks is skewed to the right. Wells Fargo and Citigroup have similar standard deviations at $1,030,743,871.63 and $1,183,975,806.54 while JPMorgan Chase and Bank of America have larger spreads at $2,188,718,754.52 and $3,628,695,542.85.

Theory and Methodology

The rationale for using securities prices is dependent on the assumption that the rationality of the marketplace will immediately price in the effects of an outside event (MacKinlay, 1997). The efficient-market hypothesis dictates that "security prices reflect available information in a rapid and unbiased fashion and thus provide unbiased estimates of the underlying values" (Basu 1977). Based on this theory, publicly-released knowledge of a penalty levied on a bank for wrongdoing should immediately lead to a direct effect on security prices of the penalized bank relative to an industry benchmark. The market may partially discount stock price based upon the knowledge of an impending penalty, although there is still theoretical grounding to support that the announcement of a penalty would cause a shock to the stock price. In the long-term however, evidence is not as conclusive for the effect of bank scandals on bank stock prices.

This study will utilize an event study methodology to evaluate the announcement of federal agency fines on the stock price of TBTF American banks, specifically JPMorgan Chase, Citigroup, Wells Fargo, and Bank of America. The event study is the best methodology to use to study the effect of economic events on the value of firms. Event studies are designed to capture the change in the returns of a given security because of a specific event. To do this, one must calculate the abnormal return of a security over the event period. As defined by MacKinlay, "the abnormal return is the actual ex post return of the security over the event window minus the normal return of the firm over the event window" (MacKinlay 1997). The actual return is the historical stock price return without any statistical manipulation. The normal return can be defined as

"the expected return without conditioning on the event taking place" (MacKinlay 1997). For firm $_i$ and event date τ the abnormal return is:

$$AR_i\tau = R_i\tau - E(R_i\tau|X\tau)$$

where $AR_i\tau$, $R_i\tau$, and $E(R_i\tau|X\tau)$ are the abnormal, actual, and normal returns (MacKinlay 1997).

Fama-French Three-Factor Model

The Fama-French three-factor model is chosen to model normal returns due to its inclusion of size and value premiums in addition to the Capital Asset Pricing Model (CAPM). The model captures anomalies that the traditional CAPM fails to account for through the inclusion of three related factors. The three factors included in the model are as follows, and explain the sensitivity of the return of $[E(R_i)-R_f]$ (the expected return less the risk-free rate):

$E(R_M) - R_f$: the excess return on a broad market portfolio

SMB: the difference in return between a portfolio of large stocks and a portfolio of small stocks

HML: the difference in return between a portfolio of high-book-to-market stocks and a portfolio of low-book-to-market-stocks

The Fama-French three-factor model is utilized as follows:

$$E(R_i) - R_f = b_i[E(R_M) - R_f] + s_iE(SMB) + h_iE(HML),$$

where b_i, s_i, and h_i are slope coefficients from a time series regression (Fama and French, 1996).

The three-factor model used in this manner has been shown to capture the cross-sectional variation in average stock returns (Cao et al., 2005). The Fama-French three-factor model removes much of the macro variance to more precisely examine the effect of bank penalties on stock returns. The four event windows that are tested range from one day before the event date to one day after the event date, one day before to seven days after, seven days before to one day after, and seven days before to seven days after to capture a variety of potentially effective event windows (Johnson and Scowcroft, 2013). Fama-French factors are obtained from The Kenneth R. French Data Library (2018) . The results of the regressions are presented in Tables 2, 3, 4, and 5.

Table 2: Estimated Coefficients for Three-Factor Model on Wells Fargo Stock Returns

	1 Lead, 1 Trail		1 Lead, 7 Trail		7 Lead, 1 Trail		7 Lead, 7 Trail	
$E(R_M) - R_f$	1.23	[64.6]***	1.23	[63]***	1.23	[63.3]***	1.23	[61.6]***
SMB	-0.29	[-7.54]***	-0.3	[-7.57]***	-0.28	[-7.15]***	-0.3	[-7.28]***
HML	1.616	[45.7]***	1.62	[44.7]***	1.63	[45.1]***	1.64	[44.2]***
Cons.	0.00007	[-0.29]	0.00008	[0.35]	0.00007	[0.29]	0.0009	[0.35]
F-Stat.	2314***		2227***		2232***		2152***	
R-sq.	0.61		0.611		0.612		0.613	

*** is 99% CI, ** is 95%, * is 90%, t-statistics are included in brackets. Coefficients are multiplied by 100 for readability

Table 3: Estimated Coefficients for Three-Factor Model on Citigroup Stock Returns

	1 Lead, 1 Trail		1 Lead, 7 Trail		7 Lead, 1 Trail		7 Lead, 7 Trail	
$E(R_M) - R_f$	1.66	[64.8]***	1.67	[63.4]***	1.66	[63.3]***	1.67	[62]***
SMB	-0.436	[-8.45]***	-0.459	[-8.65]***	-0.434	[-8.20]***	-0.457	[-8.40]***
HML	1.652	[34.7]***	1.65	34.08]***	1.66	[34.2]***	1.66	[33.6]***
Cons.	-0.0005	[-1.53]	-0.0005	[-1.64]	-0.0005	[-1.51]	-0.0005	[-1.62]
F-Stat.	1973***		1899***		1892***		1820***	
R-sq.	0.572		0.572		0.571		0.571	

*** is 99% CI, ** is 95%, * is 90%, t-statistics are included in brackets. Coefficients are multiplied by 100 for readability.

Table 4: Estimated Coefficients for Three-Factor Model on Bank of America Stock Returns

	1 Lead, 1 Trail		1 Lead, 7 Trail		7 Lead, 1 Trail		7 Lead, 7 Trail	
$E(R_M) - R_f$	1.51	[67.1]***	1.50	[67.2]***	1.51	[67.3]***	1.5	[67.7]***
SMB	-0.36	[-8.05]***	-0.37	[-8.17]***	-0.35	[-7.81]***	-0.349	[-7.90]***
HML	1.94	[46.3]***	1.87	[44.9]***	1.92	[46.1]***	1.85	[44.7]***
Cons.	-0.0002	[-0.73]	-0.0002	[-0.63]	-0.0003	[-0.98]	-0.0003	[-0.93]
F-Stat.	2415***		2346***		2384***		2330***	
R-sq.	0.622		0.627		0.63		0.636	

*** is 99% CI, ** is 95%, * is 90%, t-statistics are included in brackets. Coefficients are multiplied by 100 for readability

Table 5: Estimated Coefficients for Three-Factor Model on JPMorgan Chase Stock Returns

	1 Lead, 1 Trail		1 Lead, 7 Trail		7 Lead, 1 Trail		7 Lead, 7 Trail	
$E(R_M) - R_f$	1.49	[80.8]***	1.49	[78.6]***	1.49	[78.7]***	1.49	[76.5]***
SMB	-0.281	[-7.61]***	-0.281	[-7.42]***	-0.286	[-7.51]***	-0.287	[-7.32]***
HML	1.212	[35.65]***	1.208	[34.40]***	1.212	[34.50]***	1.208	[33.28]***
Cons.	-1.7E-7	[0]	0.00004	[0.17]	-9.6E-6	[-0.04]	0.00002	[0.09]
F-Stat.	2810.01***		2627.52***		2654.59***		2478.06***	
R-sq.	0.656		0.652		0.654		0.649	

*** is 99% CI, ** is 95%, * is 90%, t-statistics are included in brackets. Coefficients are multiplied by 100 for readability.

All t-statistics for each variable and F-statistics for each regression are significant with 99% confidence. All constants are close to one another in value, a finding which can likely be attributed to the large set of nonevent actual return data relative to event window actual return data. The four r-squared values indicating overall model fit are all close in value for all four event window regressions. This similarity in fit can be attributed to the small variation in event window size. All event window regressions yield comparable findings and there is no clear advantage in using one rather than the others based on these Fama-French three-factor models. Given the similarity in results for the four event windows, we will proceed by using all four event windows to be robust in the analysis.

Cochrane-Orcutt Regression

Normal returns are calculated from the results of the Fama-French three-factor model with all four event windows. We proceed to calculate abnormal returns by taking the difference between actual returns and normal returns for each trading day for all four banks and their respective stock data. Once abnormal returns are attained, the cumulative abnormal return is calculated by taking the sum of abnormal returns chronologically for each observation. In addition to examining bank penalties themselves, we will examine the size of the penalty and nature of the penalty. Our regression is as follows:

$$\text{CAR} = \beta_0 + \beta_1 \text{scan(window)} + \beta_2 \text{faketime} + \beta_3 \text{civcrim} + \beta_4 \text{penaltysize} + u$$

All scan(window) variables represent the varying event windows used in the regressions. The 1-day lead, 7-day trail event window is denoted by 1L7T, and similarly 7-day lead, 7-day trail is 7L7T, 7-day lead, 1-day trail is 7L1T, and 1-day lead and 1-day trail is 1L1T. The faketime variable is a dummy variable used to represent the time in days. The nature of the penalty has two categories, civil and criminal. The civcrim variable is a binary variable that represents if a penalty originates from a criminal case or not. The size of the penalty is coded with the penaltysize variable. The variable *u* represents the error term. In all of the regressions, the Breusch-Godfrey test is used to detect serial correlation. Serial correlation was detected in all models and the Cochrane-Orcutt regression is used to correct for serial correlation. Additionally, all models have undergone the White-test and been robust-corrected for heteroskedasticity.

Results

Table 6: Cumulative Abnormal Return Regression, 1-day Lead 7-Day Trail Event Window

	Bank of America		Citigroup		JPMorgan Chase		Wells Fargo	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
faketime	0.001	[0.18]	-0.009	[-3.64]	0.008	[1.03]	0.011	[1.29]
scan1L7T	-0.028	[-0.10]	0.012	[0.08]*	0.067	[0.56]	-0.112	[-0.73]
civcrim	-0.061	[-0.32]	0.006	[0.05]*	-0.170	[-2.15]	0.218	[1.49]
penaltysize	-0.061	[1.78]	1.3E-10	[1.05]	-6.9E-13	[-0.02]	1.4E-11	[0.27]
constant	2.08	[0.14]	33.7	[3.92]	-43.7	[-1.60]	-49.7	[-1.56]
Observations	4526		4526		4526		4526	

*** is 99% CI, ** is 95%, * is 90%, t-statistics are included in brackets. Coefficients are multiplied by 100 for readability.

Table 7: Cumulative Abnormal Return Regression, 7-day Lead 7-Day Trail Event Window

	Bank of America		Citigroup		JPMorgan Chase		Wells Fargo	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
faketime	0.009	[1.97]	-0.082	[-3.21]	0.009	[1.22]	0.011	[1.25]
scan7L7T	-0.068	[-0.18]	-0.092	[-0.55]	-0.008	[-0.06]	-0.153	[-0.98]
civcrim	-0.062	[-0.32]	0.006	[0.06]*	-0.169	[-2.15]	0.166	[1.15]
penaltysize	5.6E-11	[1.80]	1.3E-10	[1.06]	-8.8E-13	[-0.03]	1.3E-11	[0.26]
constant	28.6	[0.19]	33.1	[3.84]	27.2	[-1.57]	-51.5	[-1.60]
Observations	4526		4526		4526		4526	

*** is 99% CI, ** is 95%, * is 90%, t-statistics are included in brackets. Coefficients are multiplied by 100 for readability.

Table 8: Cumulative Abnormal Return Regression, 7-day Lead 1-Day Trail Event Window

	Bank of America		Citigroup		JPMorgan Chase		Wells Fargo	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
faketime	0.01	[2.13]	-0.013	[-5.18]	0.013	[1.63]	0.129	[1.47]
scan7L1T	0.573	[1.64]	-0.181	[-0.98]	-0.069	[-0.70]	-0.034	[-0.29]
civcrim	-0.065	[-0.34]	0.005	[0.05]*	-0.17	[-2.15]	0.166	[1.15]
penaltysize	5.5E-11	[1.78]	1.3E-10	[1.04]	-8.7E-13	[-0.03]	1.3E-11	[0.25]
constant	-13	[-0.08]	32.2	[3.72]	-43.3	[-1.58]	-51.3	[-1.60]
Observations	4526		4526		4526		4526	

*** is 99% CI, ** is 95%, * is 90%, t-statistics are included in brackets. Coefficients are multiplied by 100 for readability.

Table 9: Cumulative Abnormal Return Regression, 1-day Lead 1-Day Trail Event Window

	Bank of America		Citigroup		JPMorgan Chase		Wells Fargo	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
faketime	0.003	[0.65]	-0.014	[-5.55]	0.012	[1.54]	0.013	[1.47]
scan1L1T	0.567	[2.27]	-0.03	[-0.18]	0.003	[0.04]**	0.234	[1.74]
civcrim	-0.056	[-0.29]	0.005	[0.05]*	-0.169	[-2.15]	0.056	[0.40]
penaltysize	5.4E-11	[1.74]	1.3E-10	[1.03]	-6.7E-13	[-0.02]	1.1E-11	[0.20]
constant	-1.78	[-0.11]	32.8	[3.80]	-44.1	[-1.61]	-49.7	[-1.56]
Observations	4526		4526		4526		4526	

*** is 99% CI, ** is 95%, * is 90%, t-statistics are included in brackets. Coefficients are multiplied by 100 for readability.

The four regressions with different event windows reveal that the penalty announcements appear to have primarily no statistically significant effect on long-term stock price. The variables that are significant at the 90% level are civcrim for all

Citigroup event windows and the 1-day lead 7-day trail scandal event window variable for Citigroup. Given that there are only two criminal scandal events for Citigroup, the significance of criminal cases within the model is likely a statistical anomaly. This implies that there is no significant difference between civil and criminal penalties imposed by regulatory agencies. The 1-day lead 7-day trail scandal event window variable is significant at the 95% level. Despite this finding, the lack of trend in significance for all other event windows makes it challenging to draw a statistically significant conclusion. The penalty size variable displayed no statistically significant t-statistics across all four event windows.

Conclusion

The statistically insignificant results of these regressions cause us to reject the hypothesis that bank penalties have a negative effect on bank stock prices in the long-run. There are several potential reasons why TBTF banks are seemingly unaffected by their own illicit behavior. A possible explanation for insignificant results is that the penalty announcement proxy variable for banking scandals may not fully capture *when* illicit behavior is priced into banking stocks. Pricing changes may occur during other event dates in the litigation process, such as the initial news break of illicit activity or the initiation of a federal investigation. The penalty announcement variable may have been an ineffective proxy by itself and may have required other variables relating to a scandal to more effectively measure price change. It may be important to consider when suits were initiated and when suits were settled in a future investigation. Another viable explanation is that the price of the stock reverts to the mean and there is no significant effect on price that can be captured in the long-run. This reversion to mean stock price in the long-term is viable, as similar results were obtained in the Jory et al. (2015) investigation of the effects of CEO-related scandals on firms (Jory et. al, 2015).

In addition to the reversion to the mean theory, markets simply may not care about such scandals. Investors may recognize the potential risk that comes with the breaking of a scandal, but the size of a penalty relative to a bank's annual revenue may appear to be unimportantly small. The competitive nature of the banking industry may also lend itself to a lack of market reaction to banking scandals. The market may view scandals as a signal that banks are pushing legal boundaries to enhance performance, and sometimes getting caught for such illicit activities is acceptable if it is a net-zero or net-

positive practice in the long-run. A final explanation is that investors anticipate that corrective measures that occur internally after a bank scandal will compensate for an imposed federal penalty. Further investigations could include replicating the study with a larger set of scandals over a longer period of time as well as introducing smaller-sized banks into the study for a basis of comparison.

Despite the potential drawbacks of the study, the current results could have large implications. Even if stock price does revert to the mean after a scandal in the long-run, that demonstrates that investors may not consider a past track record of wrongdoing in pricing TBTF bank stocks. The TBTF label on a bank may cause long-term stock price resiliency after banking scandals and penalties. If bank stocks are truly immune to scandalous behavior in the long-run, then there is no real incentive other than a federal penalty for banks to attempt to correct their illicit ways. Policymakers should demand levied penalties be large enough to affect the bottom line for both civil and criminal cases to inflict a punitive as well as corrective measure on banks.

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