Financial penalties and bank performance

Hannes Köster , Matthias Pelster

PII: S0378-4266(17)30048-1
DOI: 10.1016/j.jbankfin.2017.02.009
Reference: JBF 5101

To appear in: *Journal of Banking and Finance*

Received date: 11 March 2016
Revised date: 30 January 2017
Accepted date: 23 February 2017

Please cite this article as: Hannes Köster , Matthias Pelster , Financial penalties and bank performance, *Journal of Banking and Finance* (2017), doi: 10.1016/j.jbankfin.2017.02.009

Financial penalties and bank performance*

Hannes Köster†

Matthias Pelster‡

Leuphana University of Lueneburg

January 30, 2016

Abstract

This paper investigates the impact of financial penalties on the profitability and stock performance of banks. Using a unique dataset of 671 financial penalties imposed on 68 international listed banks over the period 2007 to 2014, we find a negative relation between financial penalties and pre-tax profitability but no relation with after-tax profitability. This result is explained by tax savings, as banks are allowed to deduct specific financial penalties from their taxable income. Moreover, our empirical analysis of the stock performance shows a positive relation between financial penalties and buy-and-hold returns, indicating that investors are pleased that cases are closed, that the banks successfully manage the consequences of misconduct, and that the financial penalties imposed are smaller than the accrued economic gains from the banks' misconduct. This argument is supported by the positive abnormal returns, which we detected on the announcement of a financial penalty.

Keywords: financial penalty, misconduct, bank fines, bank profitability, bank performance

JEL classification: G02, G20, K20

* We would like to thank Geert Bekaert (the editor), an anonymous associate editor, two anonymous referees, Alan N. Berger, Raluca Andreea Roman, Laurent Weill, Ulf G. Baxmann, Heinrich Degenhart, Jörg Richter, Tim Hasso, Sascha Strobl, and the participants of the Leuphana University Research Seminar Accounting & Finance and the Southern Finance Association 2016 Annual Meetings for their valuable comments and suggestions. Jessica Lawniczak, Simon Kürschner and Kristin Prinzke provided excellent research assistance. Matthias Pelster would like to thank Andrea Schertler and Gregor Weiß, who while they have not commented specifically on this paper, nonetheless have been a stimulating factor in its direction. Financial support from the Förderverein Bank- und Finanzwirtschaft e.V. (FVBF) is gratefully acknowledged. All remaining errors are our own.

† Scharnhorststr. 1, D-21335 Lueneburg, Germany, telephone: +49 4131 677 2166, e-mail: *hannes.koester@leuphana.de.*

‡ Scharnhorststr. 1, D-21335 Lueneburg, Germany, telephone: +49 4131 677 2188, e-mail: *matthias.pelster@leuphana.de.*

Financial penalties and bank performance

January 30, 2016

Abstract

This paper investigates the impact of financial penalties on the profitability and stock performance of banks. Using a unique dataset of 671 financial penalties imposed on 68 international listed banks over the period 2007 to 2014, we find a negative relation between financial penalties and pre-tax profitability but no relation with after-tax profitability. This result is explained by tax savings, as banks are allowed to deduct specific financial penalties from their taxable income. Moreover, our empirical analysis of the stock performance shows a positive relation between financial penalties and buy-and-hold returns, indicating that investors are pleased that cases are closed, that the banks successfully manage the consequences of misconduct, and that the financial penalties imposed are smaller than the accrued economic gains from the banks' misconduct. This argument is supported by the positive abnormal returns, which we detected on the announcement of a financial penalty.

Keywords: financial penalty, misconduct, bank fines, bank profitability, bank performance

JEL classification: G02, G20, K20

1. Introduction

Since the financial crisis, the banking industry has been subjected to high financial penalties and increased scrutiny by regulatory agencies. On the one hand, several banking professionals assume that the number and the amount of penalties have lowered bank profitability to an extent that it has created uncertainty concerning the solvency and the business model of banks. For example, the European Systemic Risk Board warned that the scale of misconduct cases and the related penalties may become a possible source of systemic risk (European Systemic Risk Board, 2015). Likewise, the European Banking Authority introduced for the first time costs related to misconduct in its EU-wide stress test in 2014 (European Banking Authority, 2014). On the other hand, several commentators have described the litigation costs as another cost of doing business. Banks with high litigation costs tend to conduct business in areas that are not clearly regulated, which allows them to generate abnormal gains. These abnormal gains may exceed the financial penalties. In addition, many national tax laws allow banks to deduct specific financial penalties from the taxable income, reducing the impact of initially imposed penalties. As a result, shareholders might not be too concerned about the imposed financial penalties.

Based on these observations, this paper seeks to answer two main research questions: First, what is the effect of financial penalties on the profitability of banks? Second, how does the stock market evaluate financial penalties? Since only little is known about this matter, our findings help financial authorities, governments, bank managers, and investors to gain a better understanding of the implications of financial penalties on the banking sector. For financial authorities and governments, the results of our study could be valuable because they could be used to assess the deterrent effect of penalties on the profitability of banks. In other words, financial authorities and governments could evaluate whether financial penalties are high enough to prevent future misconduct. For bank management, the findings of the study are likely to be relevant because they may allow them to evaluate whether it is beneficial for them to engage in specific market behavior or to pursue specific strategies. It may also help investors to determine whether the shares of a given bank qualify as an investment.

To answer these research questions, we accumulate a unique dataset that contains hand-collected information on the amounts and the dates of individual bank fines and settlements between 2007 and 2014. The annual reports of banks have been criticized because they disclose the cost of financial penalties in a non-transparent manner, and there is no common internationally accepted standard for listing these items in reports. To obtain an estimate of

financial penalties paid by each bank in a given year, we use different databases of regulatory authorities as well as business information providers and newspaper archives.

Using this unique dataset of financial penalties, our paper is the first to a) analyze the impact of financial penalties on firms' pre- and after tax profitability and to b) examine the stock market valuation of financial penalties in the banking sector in terms of one year buy-and-hold returns and short-term market reactions. Misconduct and the resulting financial penalties are of major concern especially in the banking sector because this sector is based on trust. Therefore, the risk of reputational damage due to financial penalties is more severe in the banking sector (e.g., European Central Bank, 2016). Moreover, due to its financial intermediation and transformation function, the banking sector is systemically relevant for the economy. Bank penalties may hamper banks' capacity to fulfill their intermediation duties and thus limit access to new credit in the economy (European Central Bank, 2016). Due to these peculiarities and the fact that findings for cross-industrial samples are likely to differ from those dealing only with the financial industry, it is important to conduct analyses on this subject focused on the banking sector. Moreover, our study is related to various strands of literature: Our findings complement the literature that deals with corporate misconduct and its implication on firms' policy (e.g., Agrawal et al., 1999; Fich and Shivdasani, 2007; Nguyen et al., 2016). Our study also contributes to the debate on the effectiveness of regulatory enforcement actions. For example, the study by Delis et al. (2016) considers regulatory intervention in response to capital adequacy and liquidity concerns and its impact on bank risk. We contribute to this debate by analyzing regulatory intervention in response to misconduct of banks. Finally, our study extends the research that has examined whether shareholders benefit from corporate misconduct (e.g., Bhagat et al., 1998; Bizjak and Coles, 1995; Griffin et al., 2004).

The remainder of our paper is structured as follows: Section 2 presents related research and develops the hypotheses. Section 3 describes the data and sample, the methods, and the descriptive statistics. Section 4 presents and discusses the empirical results, and Section 5 concludes.

2. Hypotheses development and related research

2.1. Impact on profitability

According to Becker (1968), who developed an economic model to determine optimal policies to minimize illegal behavior, "a person commits an offence if the expected utility to him exceeds the utility he could get by using his time and other resources at other activities" (Becker 1968, p. 176). Transferred to the institutional level, a company's choice to engage in misconduct is the same as any other business decision (Simpson, 2002, p. 36). In the case of misconduct, the potential loss due to its detection is weighted against its potential economic gain.

In general, potential losses include costs resulting from litigation and reputational costs. The former comprises fines, restitution of damages, legal fees, and cost of legal advisers, external consultants, and expanded legal departments (Murphy et al., 2009). In addition, lawsuits raise opportunity costs because they divert management's attention from daily business activity (Griffin et al., 2004). Reputational costs emerge because of the diminished confidence of stakeholders, which is manifested, for instance, in the lower sales of a bank that is involved in consumer fraud, a higher rate of return required by investors in case of misleading financial statements, or in higher funding conditions because of an increased overall operational risk profile (Murphy et al., 2009; European Systemic Risk Board, 2015). Only a few cross-sectional studies analyzed this subject. These studies report significantly lower operating performance of firms by comparing the periods before and after the announcement of corporate fraud (Agrawal et al., 1999; Murphy et al., 2009; Tibbs et al., 2011).

In contrast to economic loss, economic gains may be achieved by banks by using unfair business practices. As suggested by Becker's model of economic analysis of choice, these practices should lead to a specific utility. Banks that are involved in litigation are often those that do business in unregulated areas or that think out of the box to create uncommon solutions. These business methods enable them to generate abnormal returns. Furthermore, banks may risk being involved in fraud because the cost of implementing and using internal controls to avoid any kind of fraud is too high (Agrawal et al., 1999). Additionally, in weak corporate governance systems, the fraudulent activities may be value-enhancing particularly for the management. In sum, these gains and cost advantages could exceed the expected value of a financial penalty.

All in all, the comparison of possible gains and losses of misconduct gives rise to the question concerning the appropriate amount of financial penalties. Furthermore, this raises the

question of how strongly these financial penalties eventually affect the bottom line of a bank. For example, US tax law allows banks to deduct compensatory damages from the taxable income, whereas fines or similar penalties paid to a government or its regulatory agencies for the violation of any law are generally not tax deductible (U.S. Code § 162 (f); 26 Code of Federal Regulations 1.162-21). Consequently, even financial penalties, which appear punitive and therefore non-deductible at a first glance, can be deducted from taxes as long as the taxpayer can prove a requisite compensatory character of the financial penalty. European banks face similar tax rules; e.g., German tax law contains similar rules. All kinds of fines imposed by a judge or payments to meet the judge's instructions refer to non-deductible expenses (German Income Tax Act Section 4 (5) No. 8; German Corporate Tax Act Section 10 No. 3). Only payments that are merely making amends for the actual incurred damage in criminal law reduces taxable income (German Corporate Tax Act Section 10 No. 3). In addition, compensation that is imposed in a civil litigation is tax deductible (German Income Tax Act Section 4). In contrast, the tax law of the United Kingdom has become stricter in this respect. Since July 8, 2015, banks have not been permitted to deduct customer compensation payments from their taxable income (Finance No. 2 Act 2015, Part 3 Section 18). However, until this date, only fines and punitive damages represented non-deductible expenses.

In conclusion, banks have been, for a variety of reasons, able to treat specific financial penalties as an ordinary business expense in most countries in the period examined. Because the resulting lower tax expenses will partly compensate the financial penalties, we test the following hypothesis:

H1: Financial penalties have a significant negative effect on banks' pre-tax profitability and a smaller effect on its profitability after taxes.

2.2 Impact on stock performance

A number of cross-industrial studies have found a significant decline in the equity value of a firm in the days after a firm's misconduct is revealed (e.g., Karpoff and Lott, 1993; Bhagat et al., 1994; Fich and Shivdasani, 2007). In general, two effects could cause this decline: The first is the reduction in the firm's future cash flow because of penalties. The second is the increase in the time- and risk-adjusted discount rate applied to the firm's expected cash flow stream. The financial and reputational damage makes a firm more vulnerable to bankruptcy and raises the perceived risk (Chava et al., 2010; Murphy et al., 2009).

With respect to short-term returns, different events during corporate litigation could prompt different market reactions. The first public announcement of a firm's misconduct can have a negative effect on the stock price. Shareholders would be expected to anticipate the potential losses caused by financial penalties, legal costs, and reputational damage (Haslem, 2005). Karpoff and Lott (1993) were among the first to conduct a large sample investigation of the effect of the initial press announcement on stock performance. They discovered negative market reactions on the event date when an allegation of fraudulent activity was reported for the first time and when the lawsuits were filed. They stated that around 6.5 percent of the value loss in the market can be explained by penalties and legal fees. The remaining loss can be explained by reputational damage. Other studies have reported similar results (e.g., Marciukaityte et al., 2006; Murphy et al., 2009; Tibbs et al., 2011). In addition, Bizjak and Coles (1995), Griffin et al. (2004), and Fich and Shivdasani (2007), among others, detected negative market reactions after lawsuits were filed. In addition, Nguyen et al. (2016) reported negative market reactions after regulatory enforcement actions of certain US supervisory bodies were made public.

The settlement or the judgement is another key event in corporate litigation. Only at this point the exact information about the fraudulent activities is revealed. Even though it is probable that information about the misconduct has surfaced before the settlement or judgement, a certain opaqueness regarding their exact nature is likely. In general, a positive effect on the stock performance is expected for several reasons. The resolution of litigation ends a dispute, it removes the uncertainty from estimates of the outcome of the case and puts an end to further protracted trials in addition to the associated costs and the social costs resulting from negative media coverage of the litigation (Haslem, 2005; Koku and Qureshi, 2006). The resolution of litigation and the associated financial penalty might also signal a change toward more elaborate corporate governance mechanisms and a more responsible mentality of the management (e.g., Agrawal et al., 1999; Fich and Shivdasani, 2007). Studies in the corporate social responsibility literature provide evidence that the market positively values a more responsible behavior of companies (e.g., Harjoto and Jo, 2011; Jo and Harjato, 2011; Fatemi et al., 2015; Cornett et al, 2016). On another note, a positive market reaction might indicate that investors assume that companies get off lightly, as financial penalties might be smaller relative to the economic gain accrued from the misconduct. In particular, settlements are viewed as the optimal solution because they lower the risk of a larger financial penalty when the court hands down a verdict instead (Haslem, 2005). In addition, they are not explicit admissions of guilt. Studies by Bhagat et al. (1994) and Koku and Qureshi (2006)

have provided empirical evidence for positive short-term market reactions to a settlement. However, other studies found a negative or an insignificant effect of the settlement on stock performance (Karpoff and Lott, 1993, 1999). Bhagat et al. (1998) found that the outcome depends on the identity of the opposing litigant. A settlement in the case of interfirm litigation leads to significant positive abnormal returns, whereas a settlement of a dispute with the government has an insignificant effect on the stock performance. Settlement announcements with private parties also tend to result in significant negative abnormal returns. Likewise, Haslem (2005) detected negative significant market reactions after the announcement of a settlement. He argued that self-interest induces managers to settle at a higher price relative to the price that the owners would have to pay if the case were not settled. In addition to short-term market reactions, Marciukaityte et al. (2006) and Tibbs et al. (2011) examined long-term stock returns following the announcement of misconduct. Both studies found no significant one- to five-year buy-and-hold abnormal returns. The results of Tibbs et al. (2011) showed only a weakly significant one year cumulative abnormal return. Overall, we expect that financial penalties coupled with reputational damage reduce expected future cash flows and increase risk-adjusted discount rates. Assuming that stock markets are forward-looking and reasonably efficient, we will test the following hypothesis:

H2: The financial penalties of a bank will have a significant negative impact on its one-year buy-and-hold return.

3. Empirical design

3.1 Data

The majority of banks examined here do not provide specific information on misconduct-related expenses in their annual reports. These expenses are typically aggregated with other expenses, and there is therefore no breakdown for our analysis. Certain banks include this kind of information in their public disclosures, but there are other problems: Some banks provide information on recent misconduct-related expenses but nothing for prior years. Consequently, the available information is not sufficient for time-series analysis. Similarly, banks sometimes change the definition or itemization of specific balance sheet positions during the sample period so that these positions include items that are not related to misconduct. Due to this lack of transparency in the financial statements, we build a database that includes information from different sources on the amounts and the date of each bank's financial penalties (e.g., Financial Times, Reuters News, and public information from

authorities and agencies such as the Financial Conduct Authority and the Financial Industry Regulatory Authority). Events are only considered when they have a final character (i.e., when a settlement was agreed on or when a judgement was made). However, due to the fact that not every judgement or settlement agreement for smaller cases is reported in the press, the aggregated values for each year can only be considered as an approximation of the exact amount. To mitigate this bias, we focus on listed banks that enjoy public attention, and therefore, the probability of misconduct being reported in the press is higher. To that end, we include all listed banks on the list of the Global Systemically Important Banks (G-SIB) of the Financial Stability Board and the largest banks in Australia, Canada, Israel, in western European countries, and in the United States. In total, our dataset comprises 68 banks from 20 countries and 671 cases of settlements, judgements, and fine payments for the period between 2007 and 2014. A list of all banks included in our sample and an overview of the number of banks sorted by country are given in Appendix A.1. In total, our sample includes 61 commercial banks, three savings institutions, two personal and business credit institutions, and two security brokers.

To analyze a bank's profitability and stock performance, accounting data is obtained from the *Thomson Worldscope* database. We follow Irresberger et al. (2015) and collect all data in U.S. dollars to avoid biased results due to different currencies. The stock market information, which is retrieved from *Thomson Reuters Financial Datastream* database, is adjusted for dividends and splits and also retrieved in U.S. dollars. Additional information on issues such as industry-specific and macroeconomic factors are collected from the *Global Financial Development* and *World Development Indicators* database of the World Bank and from the *International Financial Statistics* database of the International Monetary Fund. Regulatory factors and information on financial crises pertaining to individual countries are retrieved from the *Bank Regulation and Supervisory Survey* database developed by Barth et al. (2004) and from the *Systemic Banking Crises* database developed by Laeven and Valencia (2008), respectively.

3.2 Methodology

3.2.1 Bank profitability

To examine the extent to which financial penalties influence the profitability of listed banks, we estimate specifications from the model class of Autoregressive Distributed Lag (ADL) models. To be specific, we estimate the following model for panel data:

$$PROF_{it} = \alpha + \delta PROF_{it-1} + \beta_1 PENALTY_{it} + \sum_{j=2}^{J+1} \beta_j X_{it}^{j} + \sum_{t=1}^{T} \gamma_t Year_t + \varepsilon_{it} . \quad (1)$$

Subscript i refers to the specific bank being observed, while subscript t refers to the specific year in which it is observed. $PROF_{it}$ is the profitability, $PENALTY_{it}$ denotes the proxy for the financial penalty costs, X_{it} are the respective bank-specific and macroeconomic control variables under investigation, and $Year_t$ is a time-specific dummy variable. α denotes the constant, and ε_{it} is the disturbance variable.

In addition to a contemporaneous relationship, we also study the relationship to future profitability ($PROF_{it+1}$). With this adjusted specification, we test for possible changes in business practices or behavior in response to the financial penalty, which may be reflected in the future profitability.

Profitability ($PROF$) is measured by the pre-tax profit of average total assets ($ROAA_{pre-tax}$) and by the after-tax profit of average total assets ($ROAA_{after-tax}$). Financial penalties ($PENALTY$) are the aggregated values of the single bank financial penalties in a given year divided by total assets. Bank-specific control variables comprise the funding structure, asset structure, size, capitalization, expense efficiency, and income structure. The funding structure ($FUND$) is defined as the ratio of customer deposits to total funding, while the asset structure ($ASSET$) is the ratio of loans to total assets. The ratio of equity to total assets reflects the capitalization (CAP), and the size ($SIZE$) is measured by the logarithm of total assets. Efficiency in expense management (EXP) is proxied by the ratio of operating expenses to total assets, and the income structure (INC) is proxied by the ratio of interest income to total income. To control for the macroeconomic environment, we include the annual growth rate of the real gross domestic product (GGDP) and the interest rate (INT) on the main refinancing operations of the national central banks in the empirical model (see Appendix A.1 for an overview of all variables and data sources). The selection of the bank-specific control variables follows our intention to cover the entire structure of a bank, and this is an approach that is in line with most studies that examine the determinants of banks' profitability (e.g., Demirgüç-Kunt and Huizinga, 1999; Iannotta et al., 2007; Dietrich and Wanzenried, 2014). Furthermore, several studies in this literature have shown that profitability persists over time (e.g., Berger et al., 2000; Goddard et al., 2011; Dietrich and Wanzenried, 2014). Berger et al. (2000) explained this persistence by impediments to market competition, informational opacity, and sensitivity to regional/macroeconomic shocks to the extent that these are serially

correlated. Therefore, we choose to model bank profitability as dynamic by including the lagged profitability ($PROF_{it-1}$).

Given this dynamic specification with the included lagged dependent variable as regressor, least squares estimation methods provide biased and inconsistent results (Nickel, 1981). Another challenge in assessing a bank's profitability is the potential endogenous character of certain bank-specific determinants. For example, less profitable banks are more likely to use unfair business practices to remain competitive in the marketplace. Assuming that unfair business practices are revealed, these banks face higher financial penalty costs. An increasing number of financial penalties, however, also lead to greater costs and therefore to lower profits. In addition, other bank-specific characteristics could affect profitability, but these are difficult to quantify and consequently not considered in the model. This unobserved heterogeneity across banks also evokes biased coefficients.

To address these problems, we use the generalized method of moments estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998), also known as the system GMM estimator. This estimator controls for endogeneity, unobserved heterogeneity, and the persistence of the dependent variable. The system GMM estimator employs lagged values of the dependent variable in differences and in levels and also lagged values of other independent variables that are possibly characterized by endogeneity. The standard errors are computed in accordance with the Windmeijer (2005) finite-sample correction. The validity of the instruments is tested by employing the Hansen test of overidentifying restrictions and the Arellano and Bond (1991) test for serially uncorrelated residuals. To avoid possible instrument proliferation, we limit the number of lags of the endogenous variables and collapse the instrument set (e.g., Roodman, 2009).

A further possible challenge in analyzing the relation between financial penalties and profitability is selection bias. We have an exogenous sample selection, because our sample includes banks that pay at least in one year a financial penalty. According to Wooldridge (2016), only an endogenous sample selection has an impact on the consistency of ordinary least squares estimations. In contrast, exogenous sample selections do not produce biased estimations. Hence, there is no need to apply methods here to correct for selection bias.

3.2.2 Stock performance

To investigate the impact of financial penalties on stock performance, we again rely on an ADL model at first and perform a regression analysis based on the following equation:

$$Return_{it} = \alpha + \beta_1 PENALTY_{it} + \sum_{j=2}^{J+1} \beta_j X_{it}^{j} + \sum_{t=1}^{T} \gamma_t Year_t + \varepsilon_{it} . \quad (2)$$

The dependent variable is the one-year buy-and-hold return for bank i at time t. The denotations of the equation and the definitions of the litigation variable and control variables are the same as in Equation (1). Following Fahlenbrach et al. (2012), we additionally include the bank's profitability, the market-to-book ratio, and the beta factor as further control variables in the equation. To measure a bank's profitability ($ROAA_{pre\text{-}tax}$), we use the pre-tax profit divided by the average total assets ratio. The market-to-book ratio (MARKETtBOOK) is defined as the ratio of the market value of common equity to the book value of common equity. The beta factor (BETA) is derived by performing an ordinary least square regression between adjusted prices of the stock and the corresponding local market index.

The model is again estimated using the system GMM estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998), and the standard errors are likewise computed using the Windmeijer (2005) finite-sample correction. The Hansen test of the overidentifying restrictions, the Arellano and Bond (1991) test to control for serial correlation in the residuals confirm the validity of our instruments.

To determine whether the impact of financial penalties on the one-year buy-and-hold return is mainly driven by the market reaction to the corresponding event, we also conduct an event study. To that end, we selected all events with a financial penalty greater than USD 10 million and a clear identification of the settlement or judgement date yielding a total of 327 events. Following previous studies (e.g., Bhagat et al., 1994; Haslem, 2005; Murphy et al., 2009), we apply the market model, which stipulates that the expected return on any specific asset in the market is linear in relation to the return on the market index, as expressed in the following equation:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} , \quad (3)$$

where R_{it} stands for the stock return for bank i on day t, R_{mt} represents the daily return of the market index, α_i indicates the idiosyncratic risk component of stock i, β_i denotes the beta coefficient of share i, and ε_{it} is the error factor. We compute the coefficients by using the Scholes and Williams (1977) procedure to account for non-synchronous trading.

Additionally, we use the four-factor model, which extends the Fama-French three-factor model (Fama and French, 1993) by including the momentum factor (Carhart, 1997). In general, the model is based on the Capital Asset Pricing Model (CAPM) and contains four additional factors, which are presented in the following equation:

$$(R_{it} - r_{ft}) = \alpha_i + \beta_{im}(R_{mt} - r_{ft}) + \beta_{iSMB}SMB_t + \beta_{iHML}HML_t + \beta_{iMOM}MOM_t + \varepsilon_{it}\,, \quad (4)$$

R_{it} is the daily rate of return, r_{ft} is the risk-free rate of return, and R_{mt} represents the daily return of the market index. SMB_{t} (small minus big) measures the excess return of small over big stocks; HML_{t} (high minus low) measures the excess return of value stocks over growth stocks; and MOM_{t} (Momentum) measures the excess return of high prior return stocks over low prior return stocks.

We estimate the coefficients of Equations (3) and (4) using the corresponding daily return data for each bank over a period beginning 130 trading days to 31 days before the announcement date (t_0) and use the coefficients to predict the expected returns for different event windows before and after the announcement date. The abnormal returns in the event window are then calculated by subtracting the predicted returns from the actual returns. The sum of the averages of the abnormal returns of all stocks at time t amounts to the average cumulative abnormal returns (CAR). To determine their statistical significance, we employ, as in previous studies (e.g., Griffin et al., 2004; Koku and Qureshi, 2006; Ewelt-Knauer et al. 2015), the cross-sectional t-test. However, Boehmer et al. (1991) provided evidence that the presence of an event-induced variance lowers the power of the cross-sectional t-test to identify abnormal performance. Therefore, we additionally utilize the standardized cross-sectional test by Boehmer et al. (1991) as a second parametric test. We also use the generalized sign test proposed by Cowan (1992) as a non-parametric test. The advantage of this kind of test is that it is not based on particular assumptions concerning the distribution of the abnormal returns of stocks.

To explain the results of the event study in greater detail, we then evaluate the cross-sectional information content of financial penalty announcements by regressing the announcement-period CAR against a set of explanatory variables, as expressed in the following equation:

$$CAR_i = \alpha + \beta_1 SPENALTY_i + \beta_2 RPENALTY_i + \sum_{j=3}^{J+2} \beta_j X_i^j + \beta_{J+3} TYPE_i + \varepsilon_i\,. \quad (5)$$

In particular, we regress the [-1 0] cumulative abnormal return of event i on the single financial penalty appropriate to the event i ($SPENALTY$), the remaining financial penalties in the same year ($RPENALTY$), and the control variables used in Equation (2).[1] Additionally, we

[1] As described in Section 4.2, we test different event windows and observe more pronounced results for the window [-1 | 0]. Accordingly we use the cumulative abnormal return of this specific window as the dependent variable in our multivariate analysis.

conduct seven further analyses, including a dummy variable for each type of misconduct ($TYPE$). One of the challenges of dealing with cross-sectional data is heteroscedasticity. Initial graphical examinations of the residuals show that the beta factor is greatly affected by heteroscedasticity. Moreover, regressing the squared residual from the ordinary least square regression on the beta factor shows a highly significant negative relationship. To control for this issue, we utilize weighted least squares regressions with robust standard errors and with the weights proportional to the beta factor for the estimation. To test the robustness of our results, we use the cumulative abnormal returns computed by both the market model and the Fama-French four-factor model.

3.3 Descriptive statistics

Table 1 reports descriptive statistics on the profitability and stock performance measures, the financial penalty variable, and the control variables used in our regression analyses.

[Place Table 1 about here]

The mean pre-tax return on average assets amounts to 0.630 percent for the entire sample of 68 banks for the period between 2007 and 2014. With a value of 0.429 percent, the mean after-tax return on average assets is lower. The highest value for after-tax profitability listed in our dataset is 3.879 percent, whereas the lowest value is -7.536 percent. The average one-year buy-and-hold return is negative at -0.123 percent. The standard deviation of 45.420 percent indicates that the performance of banks' stock differed considerably during the period examined here. The highest one-year buy-and-hold return is 284.158 percent, whereas the lowest is -91.5 percent. Turning to the financial penalty variable, we notice that on average, the banks in the sample paid financial penalties of 0.049 percent in relation to total assets. The maximum relative value amounts to 3.862 percent. In this specific case, the bank paid a total of USD 347.25 million in financial penalties in one year. The highest one-year sum of financial penalties amounted to USD 27 billion, which represents a relative value of 1.285 percent.

Figure 1 shows the sum and the mean value of financial penalties categorized into seven main groups.

[Place Figure 1 about here]

Misrepresentation and mis-selling of financial products to investors (such as mortgage backed securities, credit default obligations, and auction rate securities) were the source of the

largest financial penalties in the sample, with a total value of approximately USD 176 billion. The average financial penalty in this category is about USD 1.4 billion. Settlements in cases of foreclosure error come in second place in terms of total value. Their total value is approximately USD 35 billion. Violation of sanctions can also lead to high penalties and considerable costs. On average, this kind of misconduct involves a financial penalty of USD 546 million. In contrast, the financial penalties of other compliance violations tend to be less severe: Their mean value amounts to about USD 57 million. The total sum of all financial penalties paid in cases of misconduct is about USD 270 billion.

4. Empirical results

4.1 Bank profitability

The results of our analyses of bank profitability are reported in Table 2. Panel A presents the results of the analysis of pre-tax profitability, and Panel B presents the results of the analysis of after-tax profitability. All estimated models are in general reasonably specified because the results of the regression analyses exhibit stable coefficients, the F-tests show fine goodness of fit and the Hansen tests offer no evidence of over-identifying restrictions.[2] Moreover, all models show the presence of first-order autocorrelation and satisfy the second order no-autocorrelation criterion. In addition, the magnitude and high significance of the lagged dependent variable across all models validate the implementation of a dynamic model.

[Place Table 2 about here]

Model 1 of both Panels includes our full sample. The financial penalty variable has a statistically significant negative impact on the pre-tax profitability. The result is also economically significant, as a one-standard-deviation increase in the financial penalty variable yields a decrease in pre-tax profitability of -0.14 percent. In contrast, we observe no statistically significant impact on after-tax profitability. These results support our first hypothesis. The cost of misconduct seems to exceed the gains and therefore has a negative

[2] Following the procedure suggested by Bazzi and Clemens (2013), we also employ the Kleibergen-Paap LM test for underidentifying restrictions. As noted by the authors, "a standard test for weak instruments in dynamic panel GMM regressions does not currently exist, so measuring instrument strength empirically is nontrivial" (Bazzi and Clemens 2013, p. 167). Following their modus operandi, we exploit the observation by Blundell et al. (2000) that the system estimator is a weighted average of the difference and levels equations. The weights on the levels equation moments increase in the weakness of the difference equation instruments. Thus, strong instruments in the difference equation yield larger weights on that equation moments, and consequently, the model does not suffer from weak instruments. Conversely, if instruments of the difference equation are weak, this can be compensated by strong instruments in the levels equation. Hence, a valid approach for weak instrument testing is to test both equations separately. Analyzing the difference and the level equations of our main models, we can reject the null hypothesis that our model is underidentified. The level equations reports a Kleibergen-Paap LM test p-value of 0.0086 for the pre-tax profitability model and a p-value of 0.0461 for the after-tax profitability model. The difference equations report a p-value of 0.0324 and of 0.0344, respectively.

effect on pre-tax profitability. However, the insignificant coefficient in Panel B supports the argument that parts of financial penalties are tax deductible, reducing tax expenditure. Thus, after controlling for tax deductibility, the costs no longer seem to outweigh the gains.

The tax policies of the countries considered in this study are at least marginally different. Thus, we expect the effect of financial penalties on after-tax profitability to be different depending on the tax law of each country. To control for this issue, we perform several subsample analyses. Model 2 of Table 2 includes only banks in the US. Compared to the full sample, this subsample shows the same significant and insignificant effects of financial penalties on pre-tax and after-tax profitability, respectively. Model 3 includes all European banks. Compared to Model 2, the effect of financial penalties on pre-tax profitability is also significant. However, the results of the regression analysis on after-tax profitability differ from those of Model 2. The variable financial penalty has a significant negative effect. There are two ways to explain this result. First, the banks examined in this paper have been accused of different kinds of misconduct, and as a result, they have faced different penalties. As shown in Panel A of Figure 1, European banks have mainly been penalized for, in addition to mis-selling towards investors, the violation of sanctions, market manipulation, and tax evasion. The penalties imposed on these banks are the result of criminal law cases; they are punitive and therefore have no compensatory character. For this reason, they are not tax deductible. In contrast, US banks mainly paid financial penalties that are imposed in response to the mis-selling of financial products to investors or errors during foreclosure processes. The payments to the injured investors and homeowners are compensatory and therefore tax deductible. The second aspect is that US tax law and the judicial system allow for more flexibility than those in European countries. US tax law gives courts and regulators more leeway regarding the compensatory character of a financial penalty.

In addition to tax systems, banks are subjected to different competitive and regulatory environments, which may have an influence on the effect of financial penalties on profitability. We expect that instances of misconduct by banks that operate in a highly competitive environment are likely to lead to greater financial damage. Customers in a highly competitive banking market have more alternatives, and they are more likely to change their business relationship in the case of misconduct. To measure competition in the banking market, we use the Lerner index, which is collected for the corresponding banking markets from the World Bank's database. The index represents the mark-up of price over marginal costs, whereby higher values denote less competition among banks. In Model 4, we include

the centered values of the Lerner index and their interaction with the financial penalty variable. The results in both panels show that the interaction term has no significant effect. This provides no evidence to support our hypothesis that the impact of financial penalties on bank profitability depends on the degree of competition in the banking sector. The Lerner index shows no significant impact on bank profitability. This insignificant result is in line with other findings in the literature (e.g., Berger, 1995; Athanasoglou et al., 2008; Dietrich and Wanzenried, 2014). Athanasoglou et al. (2008) explained this outcome by the fact that more competitive structures lead to improved managerial practices, which, in turn, offset the decline in profitability.

A further trend in the banking market is increasing regulation. Primarily in response to the financial crisis, national supervisory authorities have enacted many different regulations to stabilize the financial system and to prevent undesirable developments. Furthermore, several authorities were given greater leeway to intervene in times of crisis, and new authorities were established.[3] We expect that this kind of increased supervision has far-reaching consequences for banks accused or found guilty of misconduct. To measure the impact of scrutiny, we use the supervisory power index, which is taken from the Bank Regulation and Supervisory Survey Database developed by Barth et al. (2004). This index measures the extent to which supervisory authorities are allowed to take specific actions to prevent and correct undesirable developments; higher scores denote greater power. The centered values of this index and their interaction with the financial penalty variable are considered in Model 5. However, the results of this model provide no evidence that supervision has a measurable impact on the pre-tax or after-tax profitability of a given bank. Likewise, the interaction term has no significant effect in either panel. These results indicate that the effects of financial penalties on bank profitability do not differ significantly in terms of supervisory power.

Furthermore, the financial crisis starting in 2007 led to economic downturns of various extents and durations in each country. In Model 6, we analyze possible pre-crisis and post-crisis effects of the financial penalties on the profitability of banks. To identify the periods of banking crisis in the different countries, we rely on the financial crises database provided by Laeven and Valencia (2012). Following the approach by Demirgüç-Kunt et al. (2013) to differentiate between crisis and non-crisis effects, we generate two financial penalty variables:

[3] An example is the Financial Conduct Authority (FCA), which was formed on 1 April 2013 in the United Kingdom and regulates the conduct of financial services firms. The FCA is, in addition to the Prudential Regulation Authority (PRA), one of the successors of the Financial Service Authority (FSA). The main objectives of the FCA are the protection of consumers, the enhancement of market integrity, the promotion of healthy competition, and the fight against financial crime. In contrast, the PRA focuses on prudential regulation.

The first one takes the original financial penalty values if a country is confronted with a financial crisis in a given year, and zero otherwise. The second variable contains only financial penalty values if a country does not experience a crisis. Both variables have a significant negative coefficient in the pre-tax profitability regression and insignificant coefficients in the after-tax profitability regression. These indicate that the results of the baseline regressions are not crisis-driven.

In Model 7, we investigate whether there is any change in business practices and behavior in the aftermath of a financial penalty that is reflected in the future profitability. To that end, we regress the financial penalty and control variables on the pre-tax and after-tax profitability of the following year. The financial penalty variable shows a statistically weak significant negative impact on the pre-tax and after-tax profitability. The following two explanations are possible: First, banks generate less income either due to the reputational damage or due to a withdrawal from lucrative but also risky financial activities. Second, banks increase their expenses to implement internal controls to avoid possible future misconducts. To analyze these possible relations, we regress the explanatory variables on the income-to-total-assets ratio and the expense-to-total-assets ratio of the following year. As shown in Table 3, the relation between financial penalties and the expense ratio is insignificant. In contrast, the one between financial penalties and the income ratio shows a significant negative coefficient. These results indicate that the negative relation between financial penalties and future profitability most likely stems from reduced business activities in the following year.

[Place Table 3 about here]

Finally, in Models 8 and 9 (Table 2), we check the methodological robustness of the baseline results. In Model 8, we run a system GMM regression with winsorized variables at the 1 percent level to eliminate outliers. In Model 9, we employ an ordinary least squares (OLS) regression. The results obtained for both regression models on the pre-tax and after-tax profitability do not differ noticeably from those found in Model 1. Financial penalties are also shown to have a significant negative impact on pre-tax profitability but no impact on after-tax profitability. Likewise, the control variables retain both their signs and their statistical significance.

Concerning the control variables, their outcome in Models 1 to 7 shows that pre-tax profitability is further driven by capitalization, size, interest rate, and the prior year's profitability. The results for after-tax profitability are similar in terms of the control variables. Compared to the findings of other empirical and theoretical studies in the field (e.g.,

Athanasoglou et al., 2008; García-Herrero et al., 2009, Dietrich and Wanzenried, 2014), these variables do not display surprisingly contradictory results.

4.2 Stock performance

Table 4 shows the results of the bank stock performance regression analysis, in which the explanatory and control variables are regressed against one-year buy-and-hold returns. The stable coefficients, the F-tests, the Hansen tests, and the first- and second-order autocorrelation tests are satisfactory across all models and confirm an appropriate specification of the dynamic model.[4]

[Place Table 4 about here]

Model 1 of Table 4 comprises the full sample. The results show a significant positive relationship between financial penalties and the one-year buy-and-hold returns. The result is also economically significant, as a one-standard-deviation increase in the financial penalty variable yields an increase in the one-year buy-and-hold return of 2.96 percent. This finding contradicts Hypothesis 2, which states that financial penalties should have a negative impact on buy-and-hold returns. This hypothesis is based on the assumption that financial penalties reduce future cash flow and raise the discount rate of a bank, resulting in decreased firm equity value. However, the positive result indicates the two following aspects: First, investors assume that corporate governance mechanisms will be improved as a consequence of a financial penalty and that the mentality of the management will change toward a more responsible one. Responsible sell practices and less controversial products should increase the stakeholder satisfaction and contribute to a higher profitability of a bank according to the good management hypothesis (Waddock and Graves, 1997). Thus, investors expect good prospects for a bank that successfully manages the consequences of misconduct. Second, the positive result also indicates investors are content that the imposed financial penalty is smaller relative to the economic gain accrued from the banks' misconduct. Supporting this argument, the profitability analysis in Section 4.1 shows that lower tax expenditures partly compensate higher financial penalties; as a result, after-tax profitability or, rather, after-tax cash flows are not statistically significant affected by financial penalties. Again, we run a subsample analysis to test this relation. The first subsample includes US banks (Model 2), and the second one

[4] In addition, we apply the Kleibergen-Paap LM test for underidentifying restrictions. For the main model, the corresponding p-value is 0.0533 for the level equation and 0.8776 for the difference equation. According to Bazzi and Clemens (2013) and Blundell et al. (2000), the system GMM estimator induces that the weak instruments of the difference equation are compensated by strong instruments in the level equation. Exploiting this observation, we conclude that in sum our model does not suffer from weak instruments.

includes European banks (Model 3). Because the after-tax profitability of European banks is, in contrast to US banks, significantly negatively affected by financial penalties, we expect the buy-and-hold return of European banks to not be significantly positively affected by financial penalties. The results of Model 2 and 3 provide evidence for this interpretation. The coefficient of the financial penalty variable in the European banks subsample is not significantly different from zero, whereas we observe a strong positive relation to the buy-and-hold return in the US banks subsample. In sum, the results indicate that if financial penalties do not significantly affect after-tax profitability, there is no negative market adjustment in terms of the one-year buy-and-hold returns.

In Models 4 to 6, we also investigate whether the competition in the banking sector, the regulatory environment, or periods of financial crises have an influence on the effect of financial penalties on stock performance. For the Lerner index, the supervisory power, and their interactions with the financial penalty variable, we do not observe a significant effect on the buy-and-hold return. However, the results of Model 6 indicate that financial penalties have a significant positive impact on the one-year buy-and-hold return only in non-crisis times. Investors may avoid investing in stocks of banks that were fined in periods of banking crises. During these periods, it is more challenging for investors to predict the development of the banking sector in general and the banks' future cash flows in particular.

In Models 7 and 8, we check the methodological robustness of our results again. Model 7 reports the system GMM regression results with winsorized variables at the 1 percent level, and Model 8 shows the results, which are estimated by an ordinary least squares (OLS) regression. In both models, we observe a significant positive relation between financial penalties and the one-year buy-and-hold return. Similarly, the control variables remain virtually unchanged.

With respect to the results of the control variables, we find that they have the expected sign or are supported by findings of other recent studies in the field. In terms of the full sample, the market-to-book ratio has a highly significant positive impact on the stock performance. This is in line with studies by Fahlenbrach and Stulz (2011), Aebi et al. (2012), and Irresberger et al. (2015). As expected, a higher return on assets is also associated with higher stock returns. Bank size has a negative impact on the overall stock performance of a given bank; this finding is in line with studies by Aebi et al. (2012), Gandhi and Lustig (2015), and Irresberger et al. (2015). Gandhi and Lustig (2015) explain this result in terms of the pricing of implicit bailout guarantees for larger banks. Other control variables such as asset structure, income structure, or funding structure seem to play no significant role in

determining the buy-and-hold return. Beltratti and Stulz (2012), Aebi et al. (2012), and Irresberger et al. (2015) reported, depending on their subsamples, similar insignificant results.

The outcome of the event study concerning the market reaction on the settlement (or verdict) announcement is summarized in Table 5. Panel A reports the cumulative average abnormal returns and the test statistics based on the market model. Panel B reports the results based on the Fama-French four-factor model. Both models show that the stock market's reaction is positive in the three-day period that includes the day before and after the announcement. To refine these results, we consider the two-day period of the announcement day and the day after and the two-day period including the announcement day and the day before. In the first case (t_0 to t_{+1}), almost all test statistics show no significance. In the second case (t_{-1} to t_0), the corresponding test statistics provide evidence for significant positive cumulative abnormal returns. This finding may indicate that information on a case's resolution is often already available in the public domain before the first news outlets report the outcome. The cumulative abnormal return amounts to 0.35 percent, the result generated with the market model, and 0.37 percent, the result computed by the Fama-French four-factor model. The significance level of the cumulative abnormal return dissipates with the broadening of the event window. For the event windows t_{-30} to t_0 and t_0 to t_{+30}, all examined test statistics fail to reject the null hypothesis at conventional levels of significance. The outcomes indicate that the settlement has only a short-term effect on the stock price. New information on the resolution of a case is quickly taken into account by the market to reflect the appropriate stock price. The positive abnormal returns could be regarded as evidence for the fact that investors regard settlements as positive news. As mentioned in Section 2.1, the resolution removes uncertainty concerning the case and puts an end to further protracted trials and negative media coverage. In addition, the positive abnormal returns support the arguments that investors expect a change in the management mentality and that they are relieved that the imposed penalties are smaller relative to the economic gain accrued from the misconduct. To determine whether the detected significance of the cumulative abnormal is not spurious, we generate 250 samples based on the same stock prices but with randomly selected event dates. In the case of pseudo-events, there should be no abnormal returns on average, provided that performance is measured properly. Analyzing the average number of samples exhibiting significant cumulative abnormal returns, one can see that for all test statistics, the Type I error rate is acceptable. In both models, the three test statistics exhibit for the different event windows rejection rates that are similar to the significance levels (see Appendix A.2). Consequently, the significances observed in this study concerning the cumulative abnormal

return of the actual financial penalty announcements for the event window t_{-1} to t_0 are not spurious.

[Place Table 5 about here]

Tables 6 and 7 present the results of the analyses of the cumulative abnormal returns (CAR). We regress a set of explanatory variables on the cumulative abnormal returns of the announcement period. The regression results reported in Table 6 contain all explanatory variables except the type of misconduct. Model 1 of Table 6 describes the results of the multivariate analysis with cumulative abnormal returns computed via the market model, and Model 2 considers the cumulative abnormal returns computed via the Fama-French four-factor model. In both models, the remaining financial penalties exhibit a significant negative effect on the cumulative abnormal return, as the market reaction to a settlement will not be very positive if investors are aware of further litigation. The amount paid has only in Model 2 a significant positive effect. Investors seem to be pleased especially if major lawsuits are settled that may have posed a threat to the solvency of the bank or perhaps threatened the banking license of the bank. The capitalization of a bank has a significant positive impact on the cumulative abnormal return in both models, which can be attributed to the fact that the probability of default due to a financial penalty decreases with the bank's capitalization.

[Place Table 6 about here]

With respect to Table 7, we find that the dummy variable violation of sanctions exhibits a significant positive coefficient in both models. The following three explanations are possible: First, US authorities are more likely to revoke the New York banking license if banks violate sanctions. Second, in cases where sanctions are violated, criminal law is applied in lieu of civil law. In misconduct cases, which are subject to civil law, different authorities are often involved, and investors join civil actions separately. Consequently, the affected banks cannot, even by large-scale settlements, successfully manage the consequences of misconduct in the past. However, in these cases, which are subject to criminal law, banks can draw a line under the story. Third, this type of misconduct entails relatively large financial penalties compared to other forms of misconduct that are subjected to criminal law, as shown in Figure 1. Because of these three aspects, investors might be especially pleased if the litigation is settled, resulting in higher cumulative abnormal returns.

The dummy variable market manipulation shows a highly significant positive coefficient, whereas the dummy variable mis-selling to investors exhibits a significant negative coefficient in Model 2. As in the case of violation of sanctions, these results could

also be explained by the type of law applied. In cases, in which markets are manipulated, criminal law is applied, whereas in cases of mis-selling to investors, civil law is applied. As described above, civil law cases can entail further lawsuits. As a consequence, the cumulative abnormal returns of resolved litigations, linked to mis-selling to investors, turn out to be smaller. In contrast, the cumulative abnormal returns of non-recurring resolved litigations, linked to the manipulation of market, turn out to be higher.

[Place Table 7 about here]

4.3 Extension: bank risk

We also examine the impact of financial penalties on the risk of banks. The aim of financial penalties is to enforce banking discipline and to deter banks from engaging in unsound risky behavior. In the positive domain, banks' reactions to financial penalties can vary from discouraging illegal and unethical behavior up to changes in the general risk policy. Adjusting the general risk policy is likely to lead to measurably lower risk taking by banks. However, substantial financial penalties may also jeopardize the profitability targets of managers. In response, they might be drawn to riskier business, which promises higher returns. Consequently, financial penalties could increase the risk taking of banks as well. To investigate this relationship, we again rely on an ADL model and perform a regression analysis based on the following equation:

$$Risk_{it} = \alpha + \delta Risk_{it-1} + \beta_1 PENALTY_{it} + \sum_{j=2}^{J+1} \beta_j X_{it}^{j} + \sum_{t=1}^{T} \gamma_t Year_t + \varepsilon_{it} . \qquad (6)$$

The denotations of the equation, the definitions of explanatory variables, and the econometric procedure are the same as those described in Section 3.2.1. We employ several accounting-based and stock market-based risk measures to provide robust evidence whether financial penalties have any influence on the risk taking by banks and its changes. We follow Berger et al. (2016) and use the ratio of risk-weighted assets to total assets (RWAtTA) and the log-transformed Z-Score (lnZScore) as accounting-based risk measures. The Z-Score is defined as the return on assets plus the capital ratio divided by the standard deviation of return on assets. We take the logarithm of the Z-Score, since its distribution is highly skewed. Higher values of the log-transformed Z-Score indicate a greater distance to default and therefore lower risk. Further, we employ the Value at Risk (VaR) and the Expected Shortfall (ES) as standard measures of firm-level risk, which are based on stock price information. The VaR shows which loss value is not exceeded within a given time horizon and confidence level (Yamai and Yoshiba, 2005). We calculate the VaR at a 5 percent confidence level for each

year. The ES shows the average loss when the loss exceeds the VaR loss level (Yamai and Yoshiba, 2005). We calculate the ES as the negative of the bank's average stock return in its 5 percent left tail for each year. Following common practice in the literature, we compute both risk measures using the opposite of the returns such that higher values indicate a larger risk taking of the bank. Since we are particularly interested in the changes of the risk taking of banks due to financial penalties, we follow Berger et al. (2016) and also calculate the annual changes of the particular risk measures from year t_0 to year t_1.

Table 8 reports the estimation results of Equation (6). The stable coefficients, the F-tests, the Hansen tests, and the first- and second-order autocorrelation tests indicate an appropriate specification.[5]

[Place Table 8 about here]

Panel A of Table 8 presents the results of the analysis of the level of risk taking of banks. Only in Model 1, the financial penalty variable shows (lnZScore) a weak significant negative coefficient. Financial penalties decrease the equity resources of a bank, resulting in a shorter distance to default and therefore in an increased insolvency risk. In contrast, the forward-looking stock price-based risk measures (Model 3-4) show no significant relationship. Likewise, the ratio of risk-weighted assets to total assets (Model 2) is not significantly affected by financial penalties. Panel B of Table 8 presents the results of the analysis of the changes in banks' risk taking. The financial penalty variable exhibits an insignificant coefficient in all models. When interpreting these results, one needs to keep in mind that a change in a bank's willingness to engage in illegal and unethical practices is not captured by these standard risk measures. If this kind of practice remains undetected, it does not appear in banks' balance sheets and is unknown to investors. However, the risk measures may capture changes in the general risk policy of a bank. Considering that, the insignificant results indicate that financial penalties do not seem to affect the general risk policy of a bank. This conclusion is consistent with the results of the bank performance analyses. Considering both analyses, there seems to be no strong incentive for banks to change their risk policy, since neither the after-tax profitability nor the buy-and-hold return are significantly negatively affected by financial penalties.

[5] The Kleibergen-Paap LM test also confirms, in sum for the level and difference equations for all models, an appropriate specification. Only the level equation of Model 1 in Panel B (ΔlnZScore) exhibits a p-value of 0.125. However, the weak instruments of the level equation are compensated by strong instruments in the difference equation (p-value = 0.00374). All other models show for both the level and difference equations acceptable Kleibergen-Paap LM statistics with p-values below the 0.1 threshold.

5. Conclusion

This study investigates the relationship between financial penalties and banks' profitability and stock performance. More specifically, in the first part of our study, we analyze the connection between the return on average assets, pre-tax as well as after-tax, and financial penalties. In the second part of our study, we examine the stock market performance of banks facing financial penalties. To that end, we consider the one-year buy-and-hold return and abnormal returns. We use a unique dataset containing hand-collected information on the amount, the type, and the date of each financial penalty imposed on the banks included in our sample. This dataset includes 671 financial penalties paid by 68 international banks between 2007 and 2014.

Our analyses provide evidence of a significant negative relation between financial penalties and the pre-tax profitability of banks. However, banks can – depending on national tax laws, the judicial system, and the type of misconduct – deduct some financial penalties from their taxable earnings. Especially in the case of the US banks examined here, we observe that the relation between financial penalties and profitability described above changes dramatically when after-tax profitability is considered. In contrast, profitability of the European banks is still significantly related to financial penalties. Also, we find evidence that financial penalties are negatively related to profitability in the following year due to a lower income-to-total-assets ratio.

Furthermore, our study reveals a positive relation between financial penalties and bank stock performance. The financial penalty variable shows a positive significant coefficient in the one year buy-and-hold regression model, and the cumulative average abnormal return exhibits a significant positive value for the announcement window of the financial penalty (t_{-1} to t_0 and t_{-1} to t_{+1}). A positive impact seems odd considering that banks' pre-tax profitability is negatively related to financial penalties. However, the positive stock market valuation indicates the four following aspects: First, investors expect a positive effect on the value of the bank, as they assume that the management will become more responsible as a consequence of a financial penalty. Second, the results show that investors are relieved that the imposed penalties are smaller than the profit generated by misconduct. Third, the partial tax deductibility of financial penalties allows banks and their shareholders to save tax, a move that partly offsets the impact of financial penalties. This relation is supported by the opposite empirical results of the European banks examined here. Financial penalties show a significant negative relation to the after-tax profitability of these banks, with the result that the financial penalties have no significant positive impact on the one-year buy-and-hold return. Fourth, the

cessation of litigation contributes to a positive stock market valuation because it eliminates the uncertainty associated with an unresolved legal dispute and puts an end to the negative media coverage and related costs. The analysis of the cumulative abnormal returns shows that investors also consider the potential financial penalties of a bank. Correspondingly, the stock market reaction to the announcement of a settlement or verdict will prove to be lower in cases of large remaining financial penalties.

Finally, our study offers a more nuanced perspective on the impact of financial penalties on the banking sector and the stock market. For national and international policy makers, it offers novel insights concerning the appropriateness of financial penalties. More specifically, this study contributes to the debate on the effects of sanction-based supervision on management and business. Further research on this important topic needs to examine the motives for misconduct in the banking sector and the potential for possible preventive measures that may be more effective deterrents than financial penalties.

Appendix

A.1. Sample banks

This table presents a lists of all banks in alphabetical order that are used in our empirical investigation and an overview of the total number of banks sorted by country.

Banks	
Agricultural Bank of China	Goldman Sachs
Allied Irish Banks	HSBC Holdings
Ally Financial	Industrial and Commercial Bank of China
American Express	ING Groep
Australia and New Zealand Banking Group	Intesa Sanpaolo
BBVA	Israel Discount Bank
Banco BPI	JPMorgan Chase & Co
Banco Comercial Português	Liechtensteinische Landesbank
Banco Espírito Santo	Lloyds Banking Group
Banco Santander	Mitsubishi UFJ Financial Group
Bank Hapoalim	Mizuho Financial Group
Bank Leumi	Morgan Stanley
Bank of America	Nordea
Bank of China	Pamrapo Bancorp
Bank of New York Mellon	PNC Financial Services Group
Barclays	Royal Bank of Canada
BB&T	Royal Bank of Scotland
BNP Paribas	Saehan Bancorp
Capital One	Société Générale
China Construction Bank	Standard Chartered
Citigroup	State Street Corporation
Citizens Financial Group	Sumitomo Mitsui Financial Group
Citizens Republic Bancorp	SunTrust Banks
Commerzbank	TCF Financial Corporation
Commonwealth Bank of Australia	Toronto-Dominion Bank
Crédit Agricole	TSB Banking Group
Credit Suisse Group	U.S. Bancorp
Danske Bank	UBS Group
Deutsche Bank	UniCredit
Dexia	UnionBanCal Corporation
DNB ASA	Wachovia Corporation
EverBank Financial Corp	Wells Fargo & Company
Fifth Third Bancorp	Westpac Banking Corporation
Flagstar Bancorp	Zions Bancorporation

Country	No. of banks
United States	26
Europe	30
Belgium	1
Denmark	1
France	3
Germany	2
Ireland	1
Israel	3
Italy	2
Liechtenstein	1
Netherlands	1
Norway	1
Portugal	3
Spain	2
Sweden	1
Switzerland	2
United Kingdom	6
Australia	3
Canada	2
China	4
Japan	3

A.2. Variable definitions and data sources

This table presents definitions and data sources for all dependent and independent variables that are used in the empirical study.

Variable name	Definition	Data source
$ROAA_{pre\text{-}tax}$	Pre-tax profits over average total assets (in %).	Worldscope
$ROAA_{after\text{-}tax}$	After-tax profits over average total assets (in %).	Worldscope
Return	One-year buy-and-hold return (in %).	Datastream, own calc.
CAR	Sum of abnormal returns for t_{-1} to t_0 (in %).	Datastream, own calc.
lnZScore	Logarithm of the ratio of the return on assets plus the capital ratio divided by the standard deviation of return on assets.	Worldscope, own calc.
RWAtTA	Ratio of risk weighted assets to total assets (in %).	Worldscope
VaR	The VaR is calculated as the loss value that is not exceeded within one year and a 5 percent confidence level.	Datastream, own calc.
ES	The ES is calculated as the negative of the average stock return in its 5 percent left tail for each year.	Datastream, own calc.
PENALTY	Sum of bank financial penalties to total assets (in %).	Own calc.
$PENALTY_{crisis}$	This variable contains financial-penalties-to-total-assets values if a country experiences a financial crisis in a given year, and zero otherwise.	Own calc., Systemic Banking Crises Database, Laeven and Valencia (2008, 2012).
$PENALTY_{nocrisis}$	This variable contains financial-penalties-to-total-assets values if a country do not experiences a financial crisis in a given year, and zero otherwise.	Own calc., Systemic Banking Crises Database, Laeven and Valencia (2008, 2012).
SPENALTY	Single bank financial penalty to total assets (in %).	Own calc.
RPENALTY	Sum of bank financial penalties minus single bank financial penalty of the corresponding event to total assets (in %).	Own calc.
TYPE	Dummy variables indicating the misconduct type: Mis-selling to investors, Foreclosures, Violation of sanctions, Market manipulation, Compliance violation, Consumer practices, and Tax evasion.	
ASSET	Ratio of total loans to total assets (in %).	Worldscope
BETA	Bank's equity beta from a market model of monthly returns, where the market is represented by the local market index.	Datastream, own calc.
CAP	Ratio of equity to total assets (in %).	Worldscope
CRISIS	Dummy variable that equals one if a systemic crisis is identified by Laeven and Valencia (2008, 2012) in a country for a given year, and zero otherwise.	Systemic Banking Crises Database, Laeven and Valencia (2008, 2012).
EXP	Ratio of operating expenses to total assets (in %).	Worldscope
FUND	Ratio of deposits to total funding (in %).	Worldscope
GGDP	Annual real GDP growth rate (in %).	World Development Indicators Database, World Bank.
INC	Ratio of interest income to total income (in %).	Worldscope
INT	Interest rate of the main refinancing operations of the national central banks (in %).	International Financial Statistics, International Monetary Fund
LERNER	The Lerner index is calculated as the average bank-level measure of the mark-up of price over marginal costs, where higher values denote less competition.	Global Financial Development Database, World Bank.
MARKETtBOOK	Market value of common equity divided by book value of common equity.	Worldscope
SIZE	Natural logarithm of a bank's total assets.	Worldscope
SUPERVISORY	This variable measures the degree to which official supervisory authorities are allowed to take specific actions to prevent and correct undesirable developments. The index ranges from 0 to 14. Higher scores indicate greater power.	Bank Regulation and Supervisory Survey Database, World Bank, Barth et al. (2006, 2013).

A.3. Rejection rates for different event study tests

Method	Panel A: Market model				
	t_{-30} to t_0	t_{-1} to t_1	t_{-1} to t_0	t_0 to t_1	t_0 to t_{30}
	Significance Level 10%				
T-test	15.60%	9.60%	11.20%	8.40%	14.80%
Standardized coss sectional test	14.80%	9.20%	11.60%	11.60%	14.80%
Generalized sign test	10.40%	9.60%	11.20%	5.60%	9.20%
	Significance Level 5%				
T-test	7.60%	4.40%	6.00%	4.80%	9.20%
Standardized coss sectional test	8.80%	6.00%	4.80%	5.20%	7.60%
Generalized sign test	6.00%	5.60%	5.60%	4.00%	6.80%
	Significance Level 1%				
T-test	1.60%	0.80%	0.00%	0.00%	1.20%
Standardized coss sectional test	2.00%	1.20%	1.20%	0.80%	1.20%
Generalized sign test	1.20%	0.40%	1.20%	0.00%	2.00%

Method	Panel B: Fama-French Four-Factor Model				
	t_{-30} to t_0	t_{-1} to t_1	t_{-1} to t_0	t_0 to t_1	t_0 to t_{30}
	Significance Level 10%				
T-test	12.40%	8.80%	10.00%	12.00%	12.80%
Standardized coss sectional test	13.20%	9.20%	8.80%	11.20%	10.00%
Generalized sign test	19.20%	17.60%	18.40%	19.60%	14.40%
	Significance Level 5%				
T-test	6.00%	5.20%	4.40%	4.80%	4.80%
Standardized coss sectional test	8.40%	4.40%	4.40%	6.40%	4.00%
Generalized sign test	14.80%	8.40%	11.60%	8.80%	8.00%
	Significance Level 1%				
T-test	2.40%	0.80%	0.40%	0.40%	2.00%
Standardized coss sectional test	1.60%	0.80%	0.80%	0.00%	1.20%
Generalized sign test	5.20%	1.20%	2.40%	3.20%	3.20%

This table presents the empirical rejection rates for the cross-sectional t-test, the standardized cross-sectional test (Boehmer et al, 1991), and the generalized sign test (Cowan, 1992). These historical stock prices of the banks under litigation are used to generate 250 samples with randomly selected event dates. Panel A shows the rejection rates of the different test statistics for the CAAR computed by the market model, whereas Panel B is based on the Fama-French four-factor model.

References

Aebi, V., Sabato, G., Schmid, M., 2012. Risk management, corporate governance, and bank performance in the financial crisis. Journal of Banking & Finance 36 (12), 3213–3226.

Agrawal, A., Jaffe, J.F., Karpoff, J.M., 1999. Management turnover and governance changes following the revelation of fraud. The Journal of Law and Economics 42 (s1), 309–342.

Arellano, M., Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. The Review of Economic Studies 58 (2), 277–297.

Arellano, M., Bover, O., 1995. Another look at the instrumental variable estimation of error-components models. Journal of Econometrics 68 (1), 29–51.

Athanasoglou, P.P., Brissimis, S.N., Delis, M.D., 2008. Bank-specific, industry-specific and macroeconomic determinants of bank profitability. Journal of International Financial Markets, Institutions and Money 18 (2), 121–136.

Barth, J.R., Caprio, G., Levine, R., 2004. Bank regulation and supervision: What works best? Journal of Financial Intermediation 13 (2), 205–248.

Barth, J.R., Caprio, G., Levine, R., 2006. Rethinking bank regulation: Till angels govern, 1st ed. Cambridge University Press.

Barth, J., Caprio, G., Levine, R., 2013. Bank regulation and supervision in 180 countries from 1999 to 2011. NBER Working Paper No. 18733.

Bazzi, S., Clemens, M.A., 2013. Blunt instruments: Avoiding common pitfalls in identifying the causes of economic growth. American Economic Journal: Macroeconomics, 5 (2), 152-186.

Becker, G.S., 1968. Crime and punishment: An economic approach. Journal of Political Economy 76 (2), 169–217.

Beltratti, A., Stulz, R.M., 2012. The credit crisis around the globe: Why did some banks perform better? Journal of Financial Economics 105 (1), 1–17.

Berger, A.N., 1995. The profit-structure relationship in banking - Tests of market-power and efficient-structure hypotheses. Journal of Money, Credit, and Banking 27 (2), 404–431.

Berger, A.N., Bonime, S.D., Covitz, D.M., Hancock, D., 2000. Why are bank profits so persistent? The roles of product market competition, informational opacity, and regional/macroeconomic shocks. Journal of Banking & Finance 24 (7), 1203–1235.

Berger, A.N., Bouwman, C.H., Kick, T., Schaeck, K., 2016. Bank liquidity creation following regulatory interventions and capital support. Journal of Financial Intermediation 26 (2), 115–141.

Bhagat, S., Brickley, J.A., Coles, J.L., 1994. The costs of inefficient bargaining and financial distress. Journal of Financial Economics 35 (2), 221–247.

Bhagat, S., Bizjak, J., Coles, J.L., 1998. The shareholder wealth implications of corporate lawsuits. Financial Management 27 (4), 5–27.

Bizjak, J.M., Coles, J.L., 1995. The effect of private antitrust litigation on the stock-market valuation of the firm. The American Economic Review 85 (3), 436–461.

Blundell, R.W., Bond, S.R., 1998. Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics 87 (1), 115–143.

Blundell, R.W., Bond S.R., Windmeijer, F., 2000. Estimation in dynamic panel data models: Improving on the performance of the standard GMM estimator. In: Baltagi, B. (Ed.), Nonstationary Panels, Panel Cointegration, and Dynamic Panels, Advances in Econometrics 15, JAI Press, Elsevier Science, Amsterdam, 53-91.

Boehmer, E., Musumeci, J., Poulsen, A.B., 1991. Event-study methodology under conditions of event-induced variance. Journal of Financial Economics 30 (2), 253–272.

Carhart, M.M., 1997. On persistence in mutual fund performance. The Journal of Finance 52 (1), 57–82.

Chava, S., Agnes Cheng, C.S., Huang, H., Lobo, G.J., 2010. Implications of securities class actions for cost of equity capital. International Journal of Law and Management 52 (2), 144–161.

Cornett, M.M., Erhemjamts, O., Tehranian, H., 2016. Greed or good deeds: An examination of the relation between corporate social responsibility and the financial performance of U.S. commercial banks around the financial crisis. Journal of Banking & Finance 70, 137–159.

Cowan, A.R., 1992. Nonparametric event study tests: Review of Quantitative Finance and Accounting 2 (4), 343–358.

Cummins, J.D., Lewis, C.M., Wei, R., 2006. The market value impact of operational loss events for US banks and insurers. Journal of Banking & Finance 30 (10), 2605–2634.

Delis, M.D., Staikouras, P.K., Tsoumas, C., 2016. Formal Enforcement Actions and Bank Behavior. Management Science, forthcoming.

Demirgüç-Kunt, A., Huizinga, H., 1999. Determinants of commercial bank interest margins and profitability. World Bank Economic Review 13 (2), 379–408.

Demirgüç-Kunt, A., Detragiache, E., Merrouche, O., 2013. Bank capital: Lessons from the financial crisis. Journal of Money, Credit and Banking 45 (6), 1147–1164.

Dietrich, A., Wanzenried, G., 2014. The determinants of commercial banking profitability in low-, middle-, and high-income countries. The Quarterly Review of Economics and Finance 54 (3), 337–354.

European Banking Authority, 2014. Results of 2014 EU-wide stress test. October 2014. https://www.eba.europa.eu/documents/10180/669262/2014+EU-wide+ST-aggregate+results.pdf

European Systemic Risk Board, 2015. Report on misconduct risk in the banking sector. June 2015. http://www.esrb.europa.eu/pub/pdf/other/150625_report_misconduct_risk.en.pdf.

Ewelt-Knauer, C., Knauer, T., Lachmann, M., 2015. Fraud characteristics and their effects on shareholder wealth. Journal of Business Economics 85 (9), 1011–1047.

Fahlenbrach, R., Stulz, R.M., 2011. Bank CEO incentives and the credit crisis. Journal of Financial Economics 99 (1), 11–26.

Fahlenbrach, R., Prilmeier, R., Stulz, R.M., 2012. This time is the same: Using bank performance in 1998 to explain bank performance during the recent financial crisis. The Journal of Finance 67 (6), 2139–2185.

Fama, E.F., French, K.R., 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 33 (1), 3–56.

Fatemi, A., Fooladi, I., Tehranian, H., 2015. Valuation effects of corporate social responsibility. Journal of Banking & Finance 59, 182–192.

Fich, E.M., Shivdasani, A., 2007. Financial fraud, director reputation, and shareholder wealth. Journal of Financial Economics 86 (2), 306–336.

European Central Bank, 2016. Financial Stability Review, May 2016.

Fiordelisi, F., Soana, M.-G., Schwizer, P., 2012. Reputational losses and operational risk in banking. The European Journal of Finance 20 (2), 105–124.

Gandhi, P., Lustig, H., 2015. Size anomalies in U.S. bank stock returns. The Journal of Finance 70 (2), 733–768.

García-Herrero, A., Gavilá, S., Santabárbara, D., 2009. What explains the low profitability of Chinese banks? Journal of Banking & Finance 33 (11), 2080–2092.

Gillet, R., Hübner, G., Plunus, S., 2010. Operational risk and reputation in the financial industry. Journal of Banking & Finance 34 (1), 224–235.

Goddard, J., Liu, H., Molyneux, P., Wilson, J.O., 2011. The persistence of bank profit. Journal of Banking & Finance 35 (11), 2881–2890.

Griffin, P.A., Grundfest, J.A., Perino, M.A., 2004. Stock price response to news of securities fraud litigation: An analysis of sequential and conditional information. Abacus 40 (1), 21–48.

Harjoto, M.A., Jo, H., 2011. Corporate governance and CSR nexus. Journal of Business Ethics 100 (1), 45–67.

Haslem, B., 2005. Managerial opportunism during corporate litigation. The Journal of Finance 60 (4), 2013–2041.

Iannotta, G., Nocera, G., Sironi, A., 2007. Ownership structure, risk and performance in the European banking industry. Journal of Banking & Finance 31 (7), 2127–2149.

Irresberger, F., Mühlnickel, J., Weiß, G.N., 2015. Explaining bank stock performance with crisis sentiment. Journal of Banking & Finance 59, 311–329.

Jo, H., Harjoto, M.A., 2011. Corporate governance and firm value: The impact of corporate social responsibility. Journal of Business Ethics 103 (3), 351–383.

Karpoff, J.M., Lott, J.R., 1993. The reputational penalty firms bear from committing criminal fraud. Journal of Law and Economics 36 (2), 757–802.

Karpoff, J.M., Lott, J.R., 1999. On the determinants and importance of punitive damage awards. The Journal of Law and Economics 42 (s1), 527–573.

Koku, P.S., Qureshi, A.A., 2006. Analysis of the effects of settlement of interfirm lawsuits. Managerial and Decision Economics 27 (4), 307–318.

Laeven, L., Valencia, F., 2008. Systemic Banking Crises: A New Database. IMF Working Paper 08/224.

Laeven, L., Valencia, F. 2012. Systemic Banking Crises Database: An Update. IMF Working Paper 12/163.

Marciukaityte, D., Szewczyk, S.H., Uzun, H., Varma, R., 2006. Governance and performance changes after accusations of corporate fraud. Financial Analysts Journal 62 (3), 32–41.

Murphy, D.L., Shrieves, R.E., Tibbs, S.L., 2009. Understanding the penalties associated with corporate misconduct: An empirical examination of earnings and risk. Journal of Financial and Quantitative Analysis 44 (1), 55–83.

Nguyen, D.D., Hagendorff, J., Eshraghi, A., 2016. Can bank boards prevent misconduct? Review of Finance 20 (1), 1–36.

Nickell, S., 1981. Biases in dynamic models with fixed effects. Econometrica 49 (6), 1417–1426.

Roodman, D., 2009. How to do xtabond2: An introduction to difference and system GMM in Stata. Stata Journal 9 (1), 86-136.

Scholes, M., Williams, J., 1977. Estimating betas from nonsynchronous data. Journal of Financial Economics 5 (3), 309–327.

Simpson, S.S., 2002. Corporate crime, law, and social control, 1st ed. Cambridge University Press.

Tibbs, S.L., Harrell, D.L., Shrieves, R.E., 2011. Do shareholders benefit from corporate misconduct? A long-run analysis. Journal of Empirical Legal Studies 8 (3), 449–476.

Waddock, S.A., Graves, S.B., 1997. The corporate social performance-financial performance link. Strategic Management Journal 18 (4), 303–319.

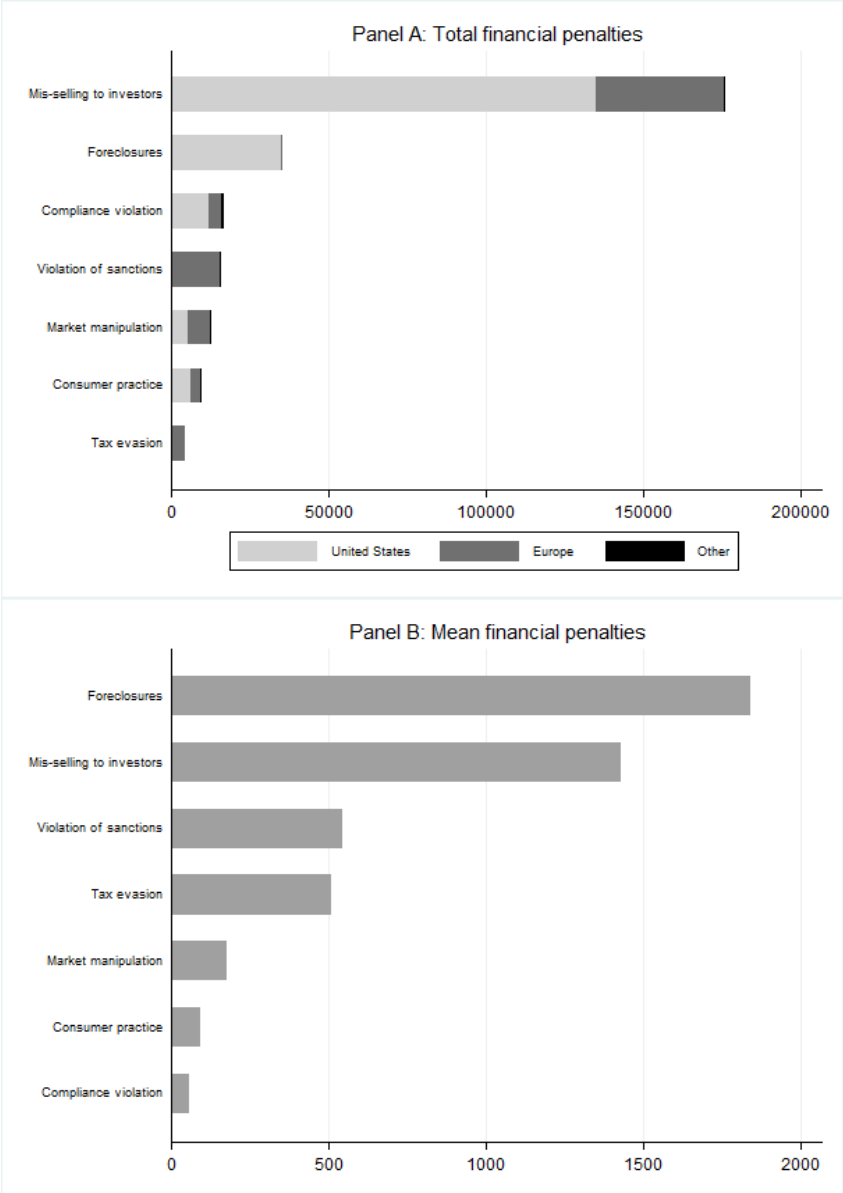
Windmeijer, F., 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics 126 (1), 25–51.

Wooldridge, J.M., 2016. Introductory econometrics: A modern approach. 6st ed. Cengage Learning, Boston.

Yamai, Y., Yoshiba, T., 2005. Value-at-risk versus expected shortfall: A practical perspective. Journal of Banking & Finance 29 (4), 997–1015.

Figures and Tables

Figure 1
Financial penalties categorized into main groups.



Panel A shows the total value of financial penalties categorized into seven main groups. Panel B illustrates the mean values. The seven main groups are: "Mis-selling to investors," a category that mainly includes settlements involving the mis-selling of mortgage backed securities, credit default obligations, and auction rate securities. "Foreclosures" comprises settlements that are paid because of errors during foreclosure processes and the resulting financial injuries to homeowners. "Violation of sanctions" includes financial penalties due to violations of US sanctions on countries such as Sudan, Iran, and Cuba. "Market manipulation" contains financial penalties imposed due to, for instance, the manipulation of LIBOR rates and foreign exchange benchmarks. "Compliance violation" comprises a variety of different violations against rules, regulations, and codices (e.g., anti-money laundering rules, the failure to provide appropriate procedures of supervision and control, or reporting failures). "Consumer practices" includes different practices of misconduct that harm customers, for instance, payment protection insurance mis-sold by banks in the United Kingdom, the discrimination of minority borrowers, or deceptive consumer marketing. "Tax evasion" contains financial penalties for banks that help customers evade taxes overseas.

Table 1
Descriptive statistics.

Variable	Observations	Mean	Std. Dev.	Min	Max
$ROAA_{pre\text{-}tax}$*	493	0.630	1.215	-7.656	5.840
$ROAA_{after\text{-}tax}$*	493	0.429	1.012	-7.536	3.879
Return	473	-0.001	0.454	-0.915	2.842
lnZ-Score	488	3.220	1.393	-4.656	8.759
RWAtTA*	464	53.906	21.129	14.026	125.747
ES	473	0.066	0.049	0.007	0.449
VaR	473	0.045	0.031	0.000	0.295
PENALTY*	493	0.049	0.243	0.000	3.862
FUND*	493	66.555	20.999	2.700	99.739
ASSET*	493	54.623	19.061	4.518	98.410
CAP*	493	6.553	3.020	0.605	18.991
SIZE	493	19.841	1.667	13.223	22.052
EXP*	493	2.580	1.808	0.186	15.220
INC*	493	66.171	17.633	14.136	118.661
MARKETtBOOK	473	1.149	0.746	0.018	5.546
BETA	473	1.393	0.570	-0.554	3.349
GGDP*	493	3.134	3.381	-5.638	14.195
INT*	493	1.629	1.846	0.100	7.470

This table presents descriptive statistics for all variables used in the regression analyses. We report the number of observations, mean, minimum and maximum values, and the standard deviation. The definition of the variables and their data sources are given in Appendix A.1. Variables that are marked with an asterisk are given in percentages. The signs of ES and VaR are inverted such that higher values indicate higher risk.

Table 2
Panel regression of bank profitability.

Panel A: pre-tax profitability	(1) Full Sample	(2) USA	(3) Europe	(4) Lerner	(5) Supervisory	(6) Crisis	(7) Future Profitability	(8) Outlier	(9) OLS
$L.ROAA_{pre\text{-}tax}$	0.4226***	0.3710***	0.5493***	0.4292***	0.4311***	0.4152***	0.5157***	0.4319***	
	(0.067)	(0.098)	(0.073)	(0.065)	(0.066)	(0.072)	(0.071)	(0.082)	
FUND	0.0016	0.0006	0.0001	0.0027	0.0013	0.0010	0.0132***	0.0044	0.0036
	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
ASSET	0.0012	0.0091	0.0027	0.0032	0.0021	0.0000	-0.0091	0.0059	0.0140**
	(0.006)	(0.009)	(0.004)	(0.005)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)
CAP	0.1795***	0.1227	0.0903*	0.1658***	0.1658***	0.1835***	-0.0043	0.1224***	0.1116***
	(0.047)	(0.076)	(0.050)	(0.045)	(0.047)	(0.048)	(0.037)	(0.036)	(0.038)
SIZE	0.1441***	0.2194***	0.0327	0.1287***	0.1380***	0.1491***	0.1968***	0.1716***	0.2494***
	(0.047)	(0.071)	(0.072)	(0.039)	(0.043)	(0.043)	(0.059)	(0.041)	(0.073)
EXP	0.0078	0.0939	-0.1518**	0.0094	0.0086	0.0138	0.2604***	0.0077	0.1116
	(0.092)	(0.063)	(0.060)	(0.085)	(0.085)	(0.089)	(0.073)	(0.075)	(0.093)
INC	-0.0151	-0.0194	-0.0171*	-0.0174**	-0.0159*	-0.0141	0.0239***	-0.0156**	-0.0255***
	(0.009)	(0.011)	(0.008)	(0.009)	(0.009)	(0.009)	(0.006)	(0.008)	(0.009)
GGDP	-0.0304	0.0525	0.0913	-0.0288	-0.0229	-0.0216	0.0058	-0.0025	0.0290
	(0.032)	(0.059)	(0.060)	(0.030)	(0.033)	(0.031)	(0.038)	(0.023)	(0.027)
INT	0.2180***	(omitted)	-0.0576	0.2216***	0.2139***	0.1876***	0.0076	0.1561***	0.2596***
	(0.056)		(0.056)	(0.055)	(0.053)	(0.056)	(0.058)	(0.043)	(0.046)
PENALTY	-0.5621***	-0.6478***	-0.4382**	-0.3793**	-0.4937***		-0.2615*	-0.7333***	-0.6888***
	(0.160)	(0.157)	(0.162)	(0.166)	(0.144)		(0.135)	(0.233)	(0.186)
LERNER				0.3841					
				(0.463)					
PENALTY x LERNER				-5.1531					
				(3.185)					
SUPERVISORY					-0.0609				
					(0.041)				
PENALTY x SUPERVISORY					0.1571				
					(0.110)				

Table 2 (continued)

CRISIS						-0.2987*			
						(0.152)			
$PENALTY_{crisis}$						-0.9502*			
						(0.521)			
$PENALTY_{nocrisis}$						-0.5872***			
						(0.159)			
Constant	-3.4439**	-4.6470***	0.3056	-3.1002***	-2.6767**	-3.3075**	-5.9846***	-3.4881***	-5.0005***
	(1.387)	(1.589)	(1.564)	(1.147)	(1.170)	(1.267)	(1.579)	(1.194)	(1.676)
Observations	428	150	194	426	428	428	428	428	493
No. of banks	66	24	30	65	66	66	66	66	68
F-test (p-val.)	51.42	32.74	74.44	42.56	47.45	56.32	23.43	32.39	14.71
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen test (p-val.)	58.03	10.60	13.59	49.40	52.23	50.65	46.26	55.95	
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	
AB test AR(1) (p-val.)	-3.308	-2.503	-2.123	-3.317	-3.270	-3.263	-3.460	-3.505	
	(0.001)	(0.012)	(0.034)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
AB test AR(2) (p-val.)	-0.463	-0.520	0.750	-0.374	-0.623	-0.779	-0.232	0.762	
	(0.644)	(0.603)	(0.454)	(0.708)	(0.533)	(0.436)	(0.817)	(0.446)	

Table 2 (continued)

Panel B: after-tax profitability	(1) Full Sample	(2) USA	(3) Europe	(4) Lerner	(5) Supervisory	(6) Crisis	(7) Future Profitability	(8) Outlier	(9) OLS
$L.ROAA_{after\text{-}tax}$	0.2908***	0.2744**	0.4353***	0.3056***	0.2937***	0.2831***	0.4139***	0.3307***	
	(0.085)	(0.122)	(0.090)	(0.084)	(0.083)	(0.084)	(0.096)	(0.078)	
FUND	0.0018	-0.0009	0.0015	0.0030	0.0022	0.0004	0.0131***	0.0038	0.0034
	(0.005)	(0.004)	(0.003)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.003)
ASSET	0.0052	0.0111	0.0035	0.0055	0.0045	0.0041	-0.0080	0.0041	0.0125***
	(0.008)	(0.009)	(0.005)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)	(0.004)
CAP	0.1802***	0.1395	0.0619***	0.1642***	0.1663***	0.1887***	-0.0074	0.1327***	0.1018***
	(0.050)	(0.082)	(0.018)	(0.047)	(0.049)	(0.051)	(0.037)	(0.032)	(0.033)
SIZE	0.1462**	0.1758**	0.0052	0.1304**	0.1443**	0.1421***	0.1567**	0.1388***	0.1983***
	(0.060)	(0.075)	(0.051)	(0.053)	(0.058)	(0.053)	(0.066)	(0.038)	(0.058)
EXP	-0.0323	0.0316	-0.1597**	-0.0247	-0.0230	-0.0325	0.2244***	0.0012	0.0426
	(0.088)	(0.066)	(0.065)	(0.084)	(0.085)	(0.086)	(0.054)	(0.062)	(0.081)
INC	-0.0185	-0.0207*	-0.0171**	-0.0189*	-0.0178	-0.0179*	0.0187***	-0.0145*	-0.0223***
	(0.011)	(0.012)	(0.008)	(0.010)	(0.011)	(0.011)	(0.007)	(0.007)	(0.007)
GGDP	-0.0349	-0.0142	0.0611	-0.0333	-0.0298	-0.0267	0.0023	-0.0172	0.0081
	(0.034)	(0.063)	(0.041)	(0.031)	(0.034)	(0.032)	(0.038)	(0.024)	(0.024)
INT	0.2188***		0.0117	0.2167***	0.2132***	0.1925***	0.0243	0.1721***	0.2219***
	(0.051)		(0.032)	(0.050)	(0.049)	0.2831***	(0.050)	(0.035)	(0.036)
PENALTY	0.0285	0.0793	-0.2782**	0.0831	-0.0168		-0.2892*	-0.3105	0.0230
	(0.248)	(0.259)	(0.125)	(0.226)	(0.202)		(0.169)	(0.307)	(0.245)
LERNER				0.0862					
				(0.526)					
PENALTY x LERNER				-1.6024					
				(3.306)					
SUPERVISORY					-0.0469				
					(0.032)				
PENALTY x SUPERVISORY					-0.0728				
					(0.132)				

Table 2 (continued)

CRISIS						-0.3272**			
						(0.130)			
$PENALTY_{crisis}$						-0.3234			
						(0.382)			
$PENALTY_{nocrisis}$						-0.0063			
						(0.252)			
Constant	-3.1833**	-3.4542*	0.6405	-2.7017**	-3.1180**	-2.7860**	-4.9304***	-2.9616***	-3.9998***
	(1.357)	(1.738)	(1.337)	(1.269)	(1.252)	(1.261)	(1.623)	(1.042)	(1.312)
Observations	428	150	194	426	428	428	428	428	493
No. of banks	66	24	30	65	66	66	66	66	68
F-test (p-val.)	40.83	35.81	49.22	33.36	47.47	41.71	15.61	39.38	13.52
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen test (p-val.)	55.96	8.603	11.73	50.63	46.80	54.14	44.87	55.88	
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	
AB test AR(1) (p-val.)	-2.918	-2.110	-2.603	-2.905	-2.891	-2.863	-2.822	-3.326	
	(0.004)	(0.035)	(0.009)	(0.004)	(0.004)	(0.004)	(0.005)	(0.001)	
AB test AR(2) (p-val.)	1.110	0.573	1.507	1.163	1.097	0.972	0.839	1.086	
	(0.267)	(0.567)	(0.132)	(0.245)	(0.273)	(0.331)	(0.401)	(0.278)	

This table presents the results of the profitability regression analyses. Panel A reports the results of the regression analysis on pre-tax profitability, and Panel B reports the results of the regression analysis on after-tax profitability. Model (1) examines the entire sample. Model (2) considers only US banks, whereas Model (3) explores only European banks. Model (4) also includes the Lerner index and its interaction with the financial penalty variable. In Model (5), the supervisory power index and its interaction with the financial penalty variable is used in the regression instead. In Model (6), the variables are winsorized at the 1 percent level. Model (7) is estimated using ordinary least squares (OLS) with robust standard errors clustered by bank (reported in parentheses). All other models are estimated using the system-GMM estimator as proposed by Arellano and Bover (1998) and Blundell and Bond (1998) with Windmeijer's (2005) finite sample correction. We report heteroscedasticity-consistent asymptotic standard errors in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The Hansen test is the test for over-identifying restrictions. AB test AR(1) and AR(2) refer to the Arellano–Bond test for first- (second)-order correlation, asymptotically N(0,1). The corresponding p-values are stated in parentheses. Time dummies are included in all models but not explicitly reported. The definition of the variables and their data sources are given in Appendix A.1.

Table 3
Panel regression of future cost and income.

	(1) Future Expense	(2) Future Income
PENALTY	-0.1224	-0.5877**
	(0.211)	(0.287)
Other controls	YES	YES
Observations	428	428
No. of banks	66	66
F-test (p-val.)	311.2	147.8
	(0.000)	(0.000)
Hansen test (p-val.)	50.83	53.83
	(1.000)	(1.000)
AB test AR(1) (p-val.)	-4.046	-3.831
	(0.000)	(0.000)
AB test AR(2) (p-val.)	0.143	0.153
	(0.887)	(0.878)

This table presents the results of the regression analyses of the cost and income in the following year. In Model (1), the dependent variable is the expense-to-total-assets ratio of year t_{+1}, and Model (2) considers the income-to-total-assets ratio of year t_{+1} as the dependent variable. Both models are estimated using the system-GMM estimator as proposed by Arellano and Bover (1998) and Blundell and Bond (1998) with Windmeijer's (2005) finite sample correction. We report heteroscedasticity-consistent asymptotic standard errors in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The Hansen test is the test for over-identifying restrictions. AB test AR(1) and AR(2) refer to the Arellano-Bond test for first- (second-) order correlation asymptotically N(0,1). The corresponding p-values are stated in parentheses. Time dummies are included in all models but not explicitly reported. The other control variables are the same as in Table 2. The definition of the variables and their data sources are given in Appendix A.1.

Table 4
Panel regression of stock performance.

	(1) Full Sample	(2) USA	(3) Europe	(4) Lerner	(5) Supervisory	(6) Crisis	(7) Outlier	(8) OLS
FUND	0.0015	-0.0005	0.0004	0.0014	0.0016	0.0015	0.0008	0.0010
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
ASSET	-0.0018	-0.0015	0.0006	-0.0015	-0.0018	-0.0017	-0.0023	-0.0008
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
CAP	-0.0008	-0.0009	-0.0157	-0.0024	-0.0030	-0.0004	0.0040	-0.0006
	(0.014)	(0.026)	(0.019)	(0.012)	(0.013)	(0.013)	(0.013)	(0.009)
SIZE	-0.0373*	-0.0412**	0.0019	-0.0416**	-0.0371*	-0.0430*	-0.0311*	-0.0308**
	(0.021)	(0.017)	(0.021)	(0.020)	(0.020)	(0.023)	(0.018)	(0.014)
EXP	-0.0221	-0.0459*	0.0089	-0.0260	-0.0216	-0.0235	-0.0286*	-0.0270*
	(0.023)	(0.026)	(0.026)	(0.019)	(0.022)	(0.022)	(0.017)	(0.014)
INC	-0.0023	-0.0005	-0.0038*	-0.0028	-0.0023	-0.0025	-0.0009	-0.0030*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
$ROAA_{pretax}$	0.0761***	0.0549	0.0519**	0.0777***	0.0765***	0.0788***	0.0795**	0.0697***
	(0.027)	(0.056)	(0.022)	(0.026)	(0.027)	(0.027)	(0.036)	(0.024)
MARKETtBOOK	0.1564***	0.2191*	0.1869***	0.1458***	0.1544***	0.1519***	0.1757***	0.1359***
	(0.031)	(0.117)	(0.040)	(0.029)	(0.032)	(0.033)	(0.038)	(0.026)
BETA	0.0604	0.0638	-0.0989	0.0798	0.0675	0.0685	0.0301	0.0442
	(0.059)	(0.046)	(0.076)	(0.056)	(0.055)	(0.052)	(0.056)	(0.040)
GGDP	-0.0074	-0.0627	0.0215	-0.0062	-0.0062	-0.0079	-0.0101	-0.0037
	(0.008)	(0.039)	(0.016)	(0.007)	(0.008)	(0.009)	(0.008)	(0.006)
INT	0.0181	-0.1523***	-0.0340	0.0213	0.0174	0.0194	0.0092	0.0153
	(0.016)	(0.037)	(0.024)	(0.017)	(0.015)	(0.015)	(0.015)	(0.010)
PENALTY	0.1220**	0.1665***	-0.0410	0.1367*	0.1118*		0.2975**	0.1288***
	(0.056)	(0.048)	(0.074)	(0.075)	(0.058)		(0.123)	(0.045)
LERNER				-0.0593				
				(0.267)				
PENALTY x LERNER				-0.4700				
				(2.385)				

SUPERVISORY					-0.0037			
					(0.010)			
PENALTY x SUPERVISORY					-0.0224			
					(0.066)			
CRISIS						0.5616		
						(0.477)		
$PENALTY_{crisis}$						0.4043		
						(0.452)		
$PENALTY_{nocrisis}$						0.0999*		
						(0.055)		
Constant	0.4374	1.4053**	0.0147	0.5359	0.4255	0.5616	0.3180	0.3962
	(0.424)	(0.618)	(0.542)	(0.429)	(0.421)	(0.477)	(0.370)	(0.297)
Observations	473	161	220	470	473	473	473	473
No. of banks	68	26	30	67	68	68	68	68
F-test (p-val.)	52.79	22.58	169.5	49.60	48.24	44.72	50.53	58.23
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen test (p-val.)	51.83	9.591	6.181	50.28	50.38	48.49	52.29	
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	
AB test AR(1) (p-val.)	-4.572	-2.325	-3.488	-4.687	-4.649	-4.700	-5.448	
	(0.000)	(0.020)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	
AB test AR(2) (p-val.)	1.402	0.404	1.205	1.410	1.441	1.338	1.427	
	(0.161)	(0.686)	(0.228)	(0.158)	(0.150)	(0.181)	(0.154)	

This table presents the results of the stock performance regression analyses. The dependent variable is the one-year buy-and-hold return. Model (1) examines the entire sample. Model (2) considers only US banks, whereas Model (3) explores only European banks. In Model (4), the variables are winsorized at the 1 percent level. Model (5) is estimated using ordinary least squares (OLS) with robust standard errors clustered by bank (reported in parentheses). All other models are estimated using the system-GMM estimator as proposed by Arellano and Bover (1998) and Blundell and Bond (1998) with Windmeijer's (2005) finite sample correction. We report heteroscedasticity-consistent asymptotic standard errors in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The Hansen test is the test for over-identifying restrictions. AB test AR(1) and AR(2) refer to the Arellano-Bond test for first- (second-) order correlation asymptotically N(0,1). The corresponding p-values are stated in parentheses. Time dummies are included in all models but not explicitly reported. The definition of the variables and their data sources are given in Appendix A.1.

Table 5
Cumulative abnormal returns following the resolution of litigation.

Panel A: Market model					
Day	t_{-1} to t_1	t_{-1} to t_0	t_0 to t_1	t_{-30} to t_0	t_0 to t_{30}
CAAR	0.0043	0.0035	0.0027	0.0077	-0.0008
T-test	2.146**	2.5238**	1.648*	1.215	-0.1252
Standardized cross-sectional test	2.0536**	3.0088***	1.1962	1.0212	-0.6008
Generalized sign test	2.7739***	1.6679*	1.0043	-0.1018	0.6725

Panel B: Fama-French four-factor model					
Day	t_{-1} to t_1	t_{-1} to t_0	t_0 to t_1	t_{-30} to t_0	t_0 to t_{30}
CAAR	0.0040	0.0037	0.0021	0.0000	0.0019
T-test	2.0612**	2.6897***	1.2451	0.0248	0.2898
Standardized cross-sectional test	1.9552*	3.0006***	0.9567	0.5959	0.0495
Generalized sign test	3.2158***	2.2199**	0.3386	-1.3213	0.6706

This table presents the cumulative average abnormal return (CAAR) estimated over various event windows. Panel A reports CAAR based on the market model, whereas Panel B reports CAAR based on the Fama-French four-factor model. The CAAR statistical significance was assessed using the cross-sectional t-test, the standardized cross-sectional test proposed by Boehmer et al. (1991), and the generalized sign test proposed by Cowan (1992). Statistical significance is denoted ***, **, and * at the 1%, 5%, and 10% levels, respectively.

Table 6
Multivariate analysis of cumulative abnormal returns.

	(1) Market Model	(2) Fama-French Four-Factor Model
RPENALTY	-1.2374***	-0.8819***
	(0.294)	(0.290)
SPENALTY	0.7347	1.7642**
	(0.768)	(0.884)
FUND	-0.0206	-0.0148
	(0.014)	(0.017)
ASSET	-0.0015	-0.0145
	(0.009)	(0.009)
CAP	0.2553***	0.1715*
	(0.087)	(0.091)
SIZE	0.0420	0.0456
	(0.101)	(0.091)
EXP	-0.0407	0.2064
	(0.215)	(0.192)
$ROAA_{pre\text{-}tax}$	-0.4804	-0.1890
	(0.318)	(0.306)
MARKETtBOOK	0.2005	0.5733
	(0.427)	(0.438)
BETA	-0.3171	-0.0593
	(0.409)	(0.505)
Constant	-0.1839	-1.1552
	(2.543)	(2.566)
Observations	313	313
adj. R^2	0.0652	0.123
F-test (p-val.)	7.273 (0.000)	3.765 (0.000)

This table presents the result of regressing the [-1 0] cumulative abnormal returns on a set of explanatory variables. Model (1) uses cumulative abnormal returns computed via the market model as the dependent variable. Model (2) uses cumulative abnormal returns computed via the Fama-French four-factor model. Both models are estimated using weighted least squares. Robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The definition of the variables and their data sources are given in Appendix A.1.

Table 7
Multivariate analysis of the effect of misconduct types on the cumulative abnormal returns.

	Market Model						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Violations of sanctions	0.7561*						
	(0.429)						
Market manipulation		0.3965					
		(0.279)					
Mis-selling to investors			-0.2146				
			(0.231)				
Foreclosures				-0.2615			
				(0.452)			
Consumer practices					0.0434		
					(0.320)		
Compliance violation						-0.7431	
						(0.531)	
Tax evasion							-0.1045
							(0.842)
Other controls	YES	YES	YES	YES	YES	YES	YES
	Fama-French Four-Factor Model						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Violations of sanctions	1.0198*						
	(0.595)						
Market manipulation		0.7331***					
		(0.253)					
Mis-selling to investors			-0.5392**				
			(0.211)				
Foreclosures				-0.1777			
				(0.416)			
Consumer practices					0.2902		
					(0.307)		
Compliance violation						-0.7530	
						(0.508)	
Tax evasion							-0.7595
							(0.898)
Other controls	YES	YES	YES	YES	YES	YES	YES

This table presents the results of regressing the [-1 0] cumulative abnormal returns on different misconduct type dummies and on various control variables. Panel A shows the results of the regression analysis on cumulative abnormal returns computed via the market model. Panel B shows the results of the regression analysis on cumulative abnormal returns computed via the Fama-French four-factor model. Models (1)–(7) include the corresponding dummy variable for the particular misconduct type. Other controls comprise the variables from the baseline regressions. All models are estimated using weighted least squares. Robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 8
Panel regression of bank risk.

	Panel A: risk taking				Panel B: change in risk taking			
	(1) lnZScore	(2) RWAtTA	(3) VaR	(4) ES	(1) ΔlnZScore	(2) ΔRWAtTA	(4) ΔVaR	(3) ΔES
PENALTY	-0.3225*	-0.7633	0.0046	0.0048	-0.0089	0.0111	0.0197	-0.0758
	(0.185)	(1.797)	(0.004)	(0.006)	(0.031)	(0.012)	(0.032)	(0.082)
Other controls	YES	YES	YES	YES	YES	YES	YES	YES
Observations	419	396	409	409	389	382	395	395
No. of banks	66	64	63	63	64	62	63	63
F-test (p-val.)	50.59	828.3	84.71	83.48	3.814	7.551	89.81	76.27
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen test (p-val.)	52.94	45.17	57.97	53.02	53.19	44.37	50.82	52.38
	0.878	0.737	0.264	0.434	0.933	0.993	0.520	0.459
AB test AR(1) (p-val.)	-4.733	-3.937	-2.534	-3.448	-3.572	-4.097	-5.854	-4.776
	(0.000)	(0.000)	(0.011)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
AB test AR(2) (p-val.)	0.207	0.653	-0.217	0.450	-1.036	0.807	0.0436	0.481
	(0.836)	(0.514)	(0.828)	(0.653)	(0.300)	(0.420)	(0.965)	(0.630)

This table presents the results of the bank risk regression analyses. Panel A reports the results of the regression analysis on the level of risk taking of banks, and Panel B reports the results of the regression analysis on the changes in risk taking. Risk taking is measured by the Z-Score (Model 1), the ratio of risk-weighted assets to total assets (Model 2), the Value at Risk (Model 3), and the Expected Shortfall (Model 4). In Panel B, the changes of the risk measures and the bank-specific control variables are calculated at bank i from year t_0 to year t_1. All models are estimated using the system-GMM estimator as proposed by Arellano and Bover (1998) and Blundell and Bond (1998) with Windmeijer's (2005) finite sample correction. We report heteroscedasticity-consistent asymptotic standard errors in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The Hansen test is the test for over-identifying restrictions. AB test AR(1) and AR(2) refer to the Arellano-Bond test for first- (second-) order correlation asymptotically N(0,1). The corresponding p-values are stated in parentheses. Time dummies are included in all models but not explicitly reported. The other control variables are the same as in Table 2. The definition of the variables and their data sources are given in Appendix A.1.