Bank Risk-Taking and Misconduct

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Abstract

This paper studies bank misconduct using a novel dataset on malpractices that resulted in conduct costs in a sample of 30 financial institutions during 2000-2016. It shows that misconduct has been prevalent over the sample period and that its intensity varies over the business cycle. Furthermore, misconduct initiation is related to bank remuneration schemes, increasing with CEO bonuses in periods of high economic growth and when bank leverage is high. To provide a possible explanation for the observed dynamics, the paper builds a theoretical model in which misconduct is linked to bank risk-taking. There, the implementation of profitable but risky projects requires more aggressive pay structures and increases manager incentives to engage in other activities that boost short-term returns. The findings have implications for regulation aimed at preventing malpractice in financial institutions.

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1. Introduction

The numerous conduct failures in banks exposed in the recent years have raised concerns that misconduct might be "a feature rather than a bug" in the financial industry (Zingales, 2015). Since the crisis of 2008-2009, major financial institutions have paid more than 300 billion US dollars for malpractices such as the packaging and sales of subprime mortgages, benchmark interest rate and foreign exchange market manipulations, or sales of unsuitable financial products and services to their customers.

The costs of bank malpractice surpass the direct losses to the affected parties. Misconduct weakens trust in the financial system, and low confidence in banks has been shown to discourage investment in stock markets and reduce deposit holdings (Sapienza and Zingales, 2012). The Bank of England Financial Stability Report (2015) also suggests that depressed enterprise borrowing from banks in the United Kingdom can be partly attributed to mistrust in financial institutions. Meanwhile, regulators are concerned about the effects that the fines and settlements resulting from misconduct have on bank lending and stability. For example, Mark Carney (2015) noted that "$150 billion of fines levied on global banks translates into more than $3 trillion of reduced lending capacity to the real economy." A report by the European Systemic Risk Board (2015) concludes that bank conduct failures and the resulting costs could be a source of systemic risk as they affect multiple markets and involve systemically important institutions.

Although the costs of bank misconduct can be substantial, the drivers behind it are not well understood. Empirical analysis on the causes of bank conduct failures has been limited due to the lack of data on the initiation dates of such events. Recent theoretical literature provides several possible explanations for bank malpractice: for example, in Bénabou and Tirole (2013), misconduct is a consequence of compensation schemes focused on observable rather than pro-social tasks because of intense competition for talent. Morrison and Thanassoulis (2017) consider the case where malpractice is profitable to bank shareholders who can use bonuses to invoke such practices by managers.

Meanwhile, analysis of the factors related to bank malpractice is important for designing policies to prevent misconduct and ensure the health of the financial industry. As discouraging misconduct through heavy financial penalties on bank shareholders is costly, recently introduced regulations focus on weakening the ex-ante incentives of managers to engage in malpractice. Constraints on manager compensation schemes such as bonus caps and requirements on deferred pay, as well as increased personal responsibility are expected to reduce bankers' gains from initiating misconduct. However, the extent to which these policies will be more successful in preventing conduct failures

than the threat of financial penalties depends on the relationship between managers' compensation schemes and misconduct, and whether malpractice results from agency conflicts in banks rather than shareholders trying to maximise profits.

This paper addresses the questions of which factors are most conducive to bank misconduct and what policies might be efficient in preventing it in two ways. First, it provides stylised evidence on changes in bank misconduct intensity over time and empirically examines whether misconduct initiation is linked to bank compensation schemes. To my knowledge, this is the first paper to investigate the conditions under which the risk of bank misconduct is higher using data on the timing of its initation.

Second, the paper introduces a theoretical framework which models the relationship between bank investment opportunities, compensation schemes, regulatory actions, and misconduct. There, shareholders resort to short-term performance pay to encourage the managers to implement risky investment projects. However, high bonuses also increase manager incentives to engage in misconduct as it boosts bank short-term returns. As manager malpractice results in conduct costs to bank shareholders, they might face a trade-off between encouraging risk-taking and preventing misconduct.

To analyse bank misconduct empirically, I use a hand-collected dataset on the alleged initiation dates of malpractices that have resulted in regulatory actions and private lawsuits against a sample of 30 major financial institutions in 2000-2016. Because of the time lag between misconduct initiation and resolution, it provides information on malpractices that started in 1998-2010. I use the resulting conduct costs as a measure of the severity of misconduct initiated each year, and further distinguish between cases related to bank underwriting activities, customer abuse, attempts to manipulate markets, compliance failures, breaches in sanctions or money laundering, cases resulting from individual employee initiatives, and other instances.

The resulting data on the number of cases initiated each year and their subsequent costs shows that bank conduct failures have been quite prevalent over the sample period. While the number and resulting costs of malpractice related to bank underwriting activities and customer abuse appear to be cyclical, other classes of misconduct are less so. It can be also observed that the value of bank conduct failures has been somewhat increasing over time.

I further examine how the value of misconduct initiated each year relates to compensation schemes. The results suggest that in periods of high economic growth, the severity of bank malpractice increases with CEO bonus to salary ratio. The correlation between CEO bonuses and malpractice is also stronger when bank leverage rises, possibly suggesting there is a relationship between managers' incentives to engage in misconduct and bank risk.

Examining the extent to which different types of bank misconduct and bank charac-

teristics are related, I find that such relationships are strongest for misconduct related to bank underwriting activities such as the issuance of mortgage-backed securities. For this type of bank malpractice, total CEO pay and bonus payments have a strong procyclical effect, while the relationship between misconduct and deferred pay is reversed. There, the positive relationship between malpractice and total CEO pay, bonuses, or wealth held in bank stock also become stronger when bank leverage increases. Meanwhile, other types of bank misconduct cannot be well-explained by the aforementioned factors.

Motivated by the empirical evidence, I build a theoretical model in which bank compensation schemes vary depending on the riskiness and profitability of bank investment opportunities, and result in changing misconduct intensity. I use a setup where profit-maximising bank shareholders hire managers to supervise investment projects. The managers can choose to implement a safe or a risky project, both of which generate cash flows for two periods. Risky projects have a higher probability of yielding high payoffs in the short run, but carry long-term risk. Meanwhile, safe projects have lower short-term payoffs and are safe in the long run.

Bank managers can engage in misconduct which increases the probability of observing high short-term returns at a cost to the bank's customers. In the model, misconduct is distinct from traditional risk-taking as it does not affect the riskiness of bank assets. However, it runs the risk of being detected by regulators, resulting in managers losing their job. To bank shareholders, misconduct detection leads to conduct costs that can outweigh the gains from malpractice initiated by managers.

In the model, manager compensation is determined endogenously by shareholders trying to maximise their income from investment projects while also minimising conduct costs. Shareholders have to use short-term performance pay to encourage risk-taking as managers would shift to safe projects that have certain long-term payoffs otherwise. Meanwhile, misconduct can be prevented if the manager's gains in terms of higher performance pay from boosting short-term bank returns are outweighed by the risk of losing her long-term compensation.

The baseline model shows that when misconduct is costly to shareholders, they face a trade-off between encouraging risk-taking and preventing misconduct. When the risky project is more profitable, the manager's compensation shifts towards short-term performance pay to induce risk-taking. If the probability of detection by regulators is not sufficiently high to deter misconduct, performance pay also results in stronger incentives for managers to engage in malpractice. At times when risky projects are unprofitable, shareholders can defer the manager's pay, reducing her incentives to engage in misconduct.

The model further illustrates how misconduct depends on the probability of detec-

tion and the costs that regulators can impose on bank shareholders. When detection risk is too low to discourage managers' malpractice but conduct costs are high, shareholders might find deferring pay and implementing safe projects more profitable than encouraging risk-taking even when the latter projects have higher cash flows. Meanwhile, increasing detection probability works through reducing manager incentives for misconduct and the associated costs to shareholders, and therefore does not affect project choice.

In model extensions I consider the situation in which regulators face constraints on the penalties they can impose on bank shareholders, and the case where financial institutions are leveraged. When conduct costs are limited by bank returns, misconduct becomes profitable to bank shareholders even at risk and detection levels at which it could have been prevented in the baseline model. In this case, misconduct and risky project implementation are complements, as long-term risk reduces expected conduct costs, resulting in more malpractice and risk-taking. Consistent with empirical evidence on the relation between bank leverage and misconduct, adding debt to the bank's balance sheet also encourages misconduct through increasing the attractiveness of risk-taking.

The paper has policy implications in the light of the recent incentives to regulate bankers' pay. Empirical evidence suggests that bank CEO compensation and misconduct are related, possibly implying that the introduction of clawbacks or restrictions on pay structures such as bonus caps and deferred pay might reduce conduct failures going forward. However, the theoretical framework introduced in this paper implies that the trade-offs involved in these policies depend on whether malpractices are profitable to bank shareholders. If compensation schemes are used to achieve shareholder objectives other than misconduct initiation, regulating pay might result in less profitable projects being implemented. In this case, higher detection risk is more efficient than imposing restrictions on bank compensation schemes or increasing conduct costs to shareholders. On the other hand, such policies can help in preventing misconduct without the associated losses in project value when misconduct is profitable to bank shareholders and bonuses are used to encourage malpractice.

2. Related Literature

The cases of bank malpractice that have come to light since the crisis of 2008-2009 have resulted in a growing body of research on conduct failures in financial firms. Existing theoretical literature considers misconduct in frameworks where it is either profitable to firm owners or results from employee actions that increase their payoffs at a cost to shareholders. For instance, Morrison and Thanassoulis (2017) study a model where

malpractice increases firm profits, one example of such cases being banks resorting to high-pressure tactics in selling Payment Protection Insurance in the United Kingdom. In the model, managers have ethical standards and assign weight to the losses of bank clients, requiring higher compensation for invoking such practices. The paper shows that shareholders may use bonuses to encourage misconduct if firm customers cannot observe bank contracts, are naïve, or the firm is owned by a manager who cannot commit not to engage in malpractice.

The baseline model in this paper rather considers the situation in which bank misconduct is profitable to bank managers and costly to shareholders. Here, if the resulting increase in her performance pay outweighs the cost of being detected, the manager may choose to engage in misconduct. Meanwhile, for bank shareholders, conduct costs imposed by regulators exceed the short-term gains from managers' malpractice. The reason why misconduct is not prevented through lower reliance on performance pay is that it is necessary to incentivise risk-taking.

The view that misconduct can be costly to shareholders is closer to the model by Bénabou and Tirole (2013). They suggest that the decline in firm ethics and resulting malpractice cases observed recently can be attributed to competition for talent, which leads to a shift in compensation schemes towards easily measurable tasks. This results in managers substituting away from pro-social behaviour, reducing firm performance and welfare in the long run. In Benabou and Tirole (2013), the trade-off faced by firm owners is between employing talented managers and reducing firm ethics, while in this paper, conduct failures are linked to compensation schemes resulting from shareholder risk preferences.

As the baseline model in this paper considers the situation in which misconduct results from agency conflicts in banks, it also relates to the broader literature on moral hazard in firms. Rather than deciding on the level of effort, here the manager may choose to engage in activities that boost her compensation. Therefore, this setting is similar to models in which managers' pay structures create agency conflicts in banks and result in managers implementing projects that maximise their income, but are too risky from bank shareholder perspective. For example, Bannier et al. (2012) show how the need to screen skilled managers leads to reliance on performance pay, which results in excessive risk-taking. Similarly, in Thanassoulis (2013), bank managers discount their future income more heavily than firm owners, making compensation deferral costly. When competition between banks increases manager reservation wages, postponing a sufficient proportion of their compensation to prevent myopic investments becomes too expensive and results in higher bonuses and a shift towards lower-value short-termist projects. An important distinction in the model built in this paper is that here, risky projects are implemented when preferred by shareholders, and performance pay results

in misconduct which boosts short-term returns at a risk of sanctions by regulators.

The policy implications of the paper are closely related to the literature on pay regulation in financial institutions. For example, Thanassoulis and Tanaka (2017) compare the effectiveness of various restrictions on bankers' pay on risk-taking in too-big-to-fail banks. Contrary to the literature on risk-shifting, here, risky projects have a higher expected return, and therefore pay restrictions to prevent malpractice by managers might also result in lower-value projects being implemented. This trade-off is similar to the findings in Hakenes and Schnabel (2014) where bonus caps can discourage excessive risk-taking, but might also weaken managerial effort. The possibility to prevent malpractice through imposing higher financial penalties on bank shareholders and diminishing the returns from risky project implementation is also related to findings in Hoffman et al. (2016), where requirements for deferred compensation can reduce the riskiness of bank investment through making the implementation of such projects more costly.

The empirical findings in this paper contribute to the limited evidence on misconduct in banks. To my knowledge, the only paper that analyses the drivers behind it is Nguyen et al. (2016) who study whether the quality of boards can prevent the occurrence of compliance failures in banks and increase the probability of their detection. Meanwhile, the current paper analyses a wider range of bank malpractices than compliance failures, and focuses on the conditions under which malpractice initiation is more likely. Namely, while Nguyen et al. (2016) analyse the likelihood of misconduct happening and being detected using dates of disciplinary actions, I use information on the year in which misconduct was initiated, as the time lag between conduct failures and resulting costs might be significant in some instances.

My findings on the relationship between bank bonuses and misconduct relate to the wider empirical literature on the effects of compensation schemes in financial firms (for example, DeYoung et al. (2013), Fahlenbrach and Stulz (2011), Bhagat and Bolton (2014)). In particular, by focusing on the effects of short-term compensation on managers' incentives to boost short-term payoffs, the paper relates to evidence in Livne et al (2013) on the positive relationship between bank CEO bonuses and short-term investments.

Finally, the observed relationship between misconduct and economic growth is consistent with the evidence in Wang et al. (2010) who find that confidence booms increase the likelihood of IPO fraud. Besides to showing that bank malpractice intensifies in economic upturns, this paper also provides evidence that compensation schemes can exacerbate such effects.

The remainder of the paper is structured as follows: Section 3 presents the empirical evidence, Section 4 introduces the theoretical model, and Section 5 concludes.

3. Empirical Evidence

In this section, I first introduce the dataset on conduct failures in the sample of 30 major financial institutions. I then move to examine whether and how the value of conduct failures starting each year relates to incentive schemes in banks and changes in economic conditions.

3.1. Data

Sources and Sample

To examine the dynamics of bank misconduct over time and across banks, I construct a dataset on malpractice which resulted in conduct costs from regulatory actions, private lawsuits, arbitrations or class actions in a sample of 30 banks during 2000-2016. The banks in the sample include major banks in the United States and a subset of Globally Systemically Important Institutions, the sample choice being determined by the higher availability of data on malpractice in these banks.[1] Data on misconduct comes from bank annual reports or SEC 10-K filings, regulators' websites (SEC, FSA, FINRA, FRB, OCC, OTC, NYSE) and newspaper articles.

I focus on the years in which misconduct is initiated rather than the timing of disciplinary events as it allows to study the conditions under which banks have a higher propensity to engage in malpractice. To determine the dates at which each misconduct case is initiated, I read the related documents and collect further information on misconduct type, the year in which regulatory investigation was started (or the private lawsuit filed) if available, and the size of resulting penalties and restitutions. When possible, I drop cases in which sample banks paid fines for misconduct in institutions that they acquired after malpractice had been initiated there, as these cannot be related to the characteristics of acquirers at the time of misconduct.[2] Only cases in which misconduct results in costs higher than 1 million US dollars and for which the alleged starting year is available are used. While in some cases such as one-time events the initiation

[1] The 30 banks in the sample are JPMorgan Chase, Bank of America, Citigroup, Wells Fargo, Goldman Sachs, Morgan Stanley, U.S. Bancorp, Bank of New York Mellon, PNC Financial Services, Capital One, State Street Corporation, TD Bank, N.A., BB&T, SunTrust Bank, American Express Company, Fifth Third Bank, Charles Schwab Corporation, HSBC, RBS, UBS, Credit Suisse, Deutsche Bank, Barclays, Lloyds Bank, Standard Chartered, Santander, BNP Paribas, ING, Credit Agricole and Societe Generale.

[2] For instance, in April 2014, the Bank of America paid 950 million US dollars to the Financial Guaranty Insurance Co. and other investors for the faulty securities that Countrywide had pooled and sold; this case would not be included in the dataset. On the other hand, in August 2014, Bank of America settled for a total of 16.5 billion US dollars with the US Department of Justice for malpractices related to mortgage backed securities that were carried out by Bank of America as well as Countrywide and Merrill Lynch; this case would be included in the dataset as it also corresponds to misconduct by the bank itself.

date of misconduct is clear, for cases that run for longer periods of time, the starting date might be hard to ascertain. In such instances, I use the beginning of the offence period indicated by regulators, or the beginning of class action periods in class action litigations. This would in general result in a somewhat upward-bias in the initiation dates.

Figure 1 plots the resulting annual dynamics in the numbers of misconduct cases initiated, investigations or private actions being launched, and regulatory or private actions against banks that result in conduct costs.

I further classify misconduct into broad categories, as different types of conduct failures could result from the distinct incentives that banks face. Namely, I differentiate between compliance failures; cases that involve asset quality misrepresentations related to banks underwriting or issuing securities; attempts to manipulate markets or asset prices and collusion; cases in which banks are disciplined for abusing customers; cases related to breaching sanctions, money laundering and assisting tax evasion; cases that result from initiatives of individual employees or unsystematic lawsuits that involve a single plaintiff; and other instances.[3]

The time period of 2000-2016 used to collect data on bank conduct costs affects the sample of years for which I have reliable information on bank misconduct initiation. Figure 2 presents the cumulative distribution of the time lags between alleged starting dates of misconduct and the resulting conduct costs (for cases that took less than 15 years to be resolved): half of the cases are resolved within 6 years since their alleged start; 90% of the cases are resolved within 10 years.

In what follows, I focus on misconduct initiated during the period of 1998-2010. Figure 2 suggests that of actions started before 1998, 10% would have been resolved before 2000 and would not be included in the data, while around 60% of the cases started after 2010 would have not been resolved by the end of 2016, which implies that some malpractice initiated in the sample period might have not been resolved yet. This results in a total of 763 actions over the 13 years for which the approximate starting date is known.

There are several important caveats to this dataset that should be outlined before the data analysis. First, it has to be noted that as information on bank misconduct comes from the analysis of bank conduct costs, it is only representative of detected malpractice. Therefore, the observed severity of misconduct is determined both by the intensity of bank malpractice and the scrutiny of regulators or bank customers. These effects are especially important if the risk of regulatory actions or lawsuits varies over time; for example, it is likely that regulators and bank customers are more vigilant

[3] A more detailed explanation of the types of misconduct used in the data analysis is provided in Appendix 1.

during economic downturns. There is no straightforward way to disentangle the effects of changing detection risk in this analysis because of the time lags between misconduct initiation and detection. In empirical analysis, I attempt to account for the intensity of regulation by controlling for the number of regulator investigations starting each year for each sample bank. Meanwhile, adding a measure capturing changes in economic conditions can also be expected to partially offset such concerns with regards to the other variables used in data analysis.

Another concern regarding the dataset used in this analysis is the availability of information on conduct costs that could drive differences in misconduct observed across banks or over time. Namely, data on private cases comes mostly from bank annual reports and newspaper articles, and therefore depends on bank reporting choices and media coverage. There are differences in bank regulation across countries and the number of regulators supervising each sample bank, as well as legal differences in terms of the propensity of clients to sue the financial intermediaries. Controlling for fixed bank effects and focusing on US banks in some specifications might alleviate such concerns to some extent.

Descriptive Statistics

There are two ways to measure the severity of bank misconduct: by using total conduct costs resulting from misconduct initiated each year, and the number of misconduct cases initiated annually. In regression analysis, I use the former measure as it might be more informative about the intensity of bank actions than the number of cases.[4] Meanwhile, the number of activities initiated in a given year will be used to complement the data on misconduct measured in monetary value as it is less affected by bank financial positions and the duration of their conduct failures. As using the number of misconduct cases starting each year as a measure of misconduct might be also misleading if it results in disciplinary actions from multiple regulators or lawsuits, in order to avoid over-weighting events in which multiple parties take actions against banks, an attempt has been made to collapse such cases into one, the initiation date of misconduct taken as the earliest one cited among the multiple regulators or private lawsuits.[5]

Table 1 presents an overview of the number of bank misconduct cases initiated each year in total and when split by misconduct type. The cases where misconduct results in multiple disciplinary actions or lawsuits are collapsed to a single event and the earliest quoted date of initiation is used.

[4]For example, both Libor and silver price manipulations by the Deutsche Bank would each count as a single event, although the former might have been more wide-spread and affected a larger market.

[5]While such grouping of cases helps to avoid potential overweighting for some cases, it also under-weighs instances with multiple injured parties which might have been more widespread or severe.

First, it appears that misconduct has been quite prevalent during the last couple of decades. It can also be seen that the number of cases in most types of misconduct has been increasing over time, which could possibly result from growing bank sizes, stricter regulation, or more transparent coverage of such cases lately. Second, we can also observe that the intensity of misconduct initiation varies over time, peaking in 2000 and 2007. As expected, misconduct related to underwriting is the most pro-cyclical, as the gains from such activities depend on asset prices. The number of compliance failures and abuse of bank clients also vary over time. Meanwhile, the incidence of cases related to breaching sanctions and market manipulation are less cyclical.

Table 2 provides information on the monetary value (in millions US dollars, 2010 prices) of bank conduct failures initiated each year. In total, the value of misconduct in the sample of 30 banks initiated during 1998-2010 has resulted in costs of around 200 billion US dollars.[6] Around 50% of the costs result from misconduct related to bank underwriting activities, followed by customer abuse and market manipulations.

The observed changes in the monetary value of compliance costs over time are by and large consistent with the dynamics in the number of cases. It appears that similar to Table 1, the intensity of bank misconduct first peaked in 2000, and then again in 2005, driven mostly by the dynamics of misconduct related to bank underwriting activities and customer abuse. We can also see that the recent boom has resulted in higher costs to financial institutions than the preceding dot-com bubble, which could result from increased bank size or more severe conduct failures. Meanwhile, the intensity of individual cases and compliance failures as well as sanctions appears to have been stable or increasing in value.

In Table 3, I summarise the costs resulting from misconduct initiated in the period of 1998-2010 for each sample bank. Almost all banks have been subject to conduct costs resulting from customer abuse or compliance failures. However, there are also differences across banks which can be partially explained by their activities. As expected, misconduct related to underwriting activities has been concentrated in major investment banks, and so were the majority of market manipulation cases. The costs related to breaches of sanctions, money laundering, and helping clients avoid taxes have also been imposed only on a subset of banks.

[6]This is lower than the 300 billion US dollars quoted by the CCP foundation, which can be explained by the fact that the data used here does not include misconduct for which the year of initiation was not available or was outside of the sample period of 1998-2010, and excludes cases initiated by entities that were later acquired by banks in the sample.

3.2. Empirical Analysis

This section examines how bank incentive schemes, economic conditions and balance sheet characteristics relate to misconduct.

The general model that is estimated takes the following form:

$$Misconduct_{i,t} = \alpha + \beta_1 Compensation_{i,t-1} + \beta_2 Leverage_{i,t} + \beta_3 Cycle_{c,t} + \gamma Controls_{i,t} + u_i + \delta_t + \epsilon_{i,t}.$$

$Misconduct_{i,t}$ is the natural logarithm of conduct costs in bank i, year t.[7] In the baseline regression, I use the total cost resulting from all types of compliance failures, which is later on split into different types.

Several variables are chosen to measure the effects of compensation schemes in $Compensation_{i,t-1}$:[8] I use the ratio of CEO bonus to salary to capture the short-termist incentives of bank CEO, and the *average* ratio of bank CEO bonuses to salaries during the sample period to measure the extent to which bank shareholders tend to rely on short-term incentives to incentivize their managers. The natural logarithm of total CEO compensation is used to measure the relationship between misconduct and current pay, while the natural logarithms of the value of shares owned by the bank's CEO (the number of shares held by CEO multiplied by the price of bank stock at the end of the year) and the balance in the deferred pay of the CEO capture the effects of shareholder wealth. This data is available from ExecuComp database only for the subsample of US banks and is only available starting in 2006 for the deferred pay measure.

The independent variable $Cycle_{c,t}$ is added to the model in line with the literature on changes in firm incentives to engage in securities fraud over the business cycle. The measure used is the deviation of GDP growth from its trend in bank location country c, retrieved from OECD Short-term Indicators database. As noted previously, one of the concerns regarding the assessment of fluctuations in bank malpractice over time is changes in detection risk. Although the $Cycle_{c,t}$ variable could be partially affected by the intensity of detection reacting to economic conditions, adding it to the regression partially controls for such effects in measuring the effects of other variables.

$Leverage_{i,t}$ is the ratio of bank's total liabilities to total assets and controls for changes in bank capital structure and the resulting risk-taking incentives by shareholders. $Controls_{i,t}$ include contemporaneous total bank assets to control for bank size and the number of regulator-initiated investigations started the preceding year (the grouped number of cases is used) as it might affect the willingness of managers to initiate new cases of malpractice. I also add the ratio of the bank's net income to total assets in

[7] I winsorize all continuous variables at 1% and 99% of their distributions and use their values in US dollars in 2010 prices

[8] I use the values in the preceding year to avoid reverse causality where misconduct results in high CEO compensation.

the preceding year to control for the effects of bank returns on misconduct, and also to account for the effects of the realised bank performance on CEO compensation. u_i and δ_t are fixed bank and year effects, respectively.[9] The descriptive statistics of the variables used in data analysis are presented in Table 4.

I start the analysis by looking at the total costs resulting from malpractices initiated each year (Table 5). The findings confirm the dynamics observed in Table 1, the value of bank misconduct varying together with the business cycle. Also, as expected, larger banks pay higher fines. Returns on bank assets are not significantly related to the severity of misconduct initiated each year, but the coefficient sign indicates that they tend to reduce the incentives for bank misconduct. Finally, malpractice appears to be higher when bank leverage increases, possibly indicating a relationship between misconduct and bank risk.

In columns (3)-(11), I turn to investigate the relationship between bank conduct failures and compensation schemes. Total CEO compensation and the value of stock held by the CEO appear to be positively correlated with the value of misconduct initiated, however the effects are not statistically significant. Interestingly, while the value of CEO wealth held in shares does not have a strong effect, the value of CEO deferred pay is related to a higher value of bank malpractice, which would suggest that on average, deferred compensation did not have a constraining effect on misconduct during the period starting in 2006 for which such information on CEO pay is available.

When looking at changes in the effects of bank compensation schemes over the business cycle, from columns (7)-(11), banks with on average higher ratio of CEO bonuses to salary behave more procyclically, such banks initiating more misconduct when the business cycle reaches its peak. Similarly, the ratio of CEO bonus to salary has a stronger relationship with malpractice initiation at times of high growth. Meanwhile, deferred pay has a negative relationship with misconduct initiation when economic growth is strong, suggesting that a higher value of CEO's wealth being deferred is related to lower pro-cyclicality of misconduct.

Overall, the results in Table 5 provide some evidence that bank conduct failures and CEO compensation are related. The significant effects in banks with on average higher ratio's of CEO bonuses to salaries might suggest that misconduct is higher and more pro-cyclical in institutions with on average higher reliance on short-term compensation. These findings could imply that compensation schemes that focus on short-term performance and provide rewards in the short run are conducive to misconduct as it typically generates short-term gains, but carries the risk of detection in the long run.

I further turn to examining how each type of bank misconduct relates to the afore-

[9]Specification tests are used to determine whether to include fixed bank effects, and year effects are added when $Cycle_{c,t}$ is not added in the model.

mentioned factors, as the incentives generated by compensation schemes and investment opportunities might be different for the distinct classes of bank conduct failures. For example, it could be expected that underwriting fraud and systematic cases of customer abuse could be related to bank incentive schemes more than compliance failures that involve cases such as reporting mistakes.

In Table 6, the model is estimated for a major type of misconduct, namely cases related to bank underwriting activities. There, similar to Table 5, strong procyclicality can be observed. When we turn to the effects of compensation schemes, they are related to malpractice positively albeit not statistically significantly. However, similar to the results in Table 5, a higher share of bonuses to salary and higher total compensation increase malpractice at the peak of the cycle, while deferred pay has a significant negative effect in such times.

These findings are consistent with evidence in Wang et al. (2010) where IPO fraud increases with investor beliefs about the industry, and the expertise of underwriters matters most in bad times. As results in Table 6 incorporate conduct costs resulting both from banks issuing assets such as mortgage backed securities and underwriting other firms' stock, it captures both their willingness to engage in malpractice as asset prices increase, and possibly lower incentives to monitor in good times. The findings show that such pro-cyclicality might be also related to bank incentive schemes, reliance on performance pay strengthening the effects.

As in Tables 5 and 6 leverage appears to be positively related to malpractice, in Tables 7 and 8 I turn to investigate whether the relationship between bank compensation schemes and business conditions change with bank leverage. In Table 7, I examine whether total bank misconduct depends on bank leverage, and find that as bank debt increases, misconduct initiation becomes more sensitive both to the business cycle and short-termist incentives in managers' pay. For misconduct related to bank underwriting activities (Table 8), bank leverage also strengthens the relationship between CEO incentives and misconduct. Namely, when leverage increases, the effects of CEO bonuses and total compensation become stronger. Interestingly, leverage also strengthens the relationship between the value of CEO shares owned and misconduct. One possible explanation for such effects could be leverage reducing the downside from misconduct in the long run as the financial penalties and losses to shareholders are restricted to the bank's capital.

In Tables 9 and 10, the other major classes of bank conduct failures related to disadvantaging clients and market manipulation are analysed (as expected, the results on other classes do not appear to be systematically related to the variables chosen and are available upon request). Customer abuse is not strongly related to the variables considered, although the compensation scheme variables retain their signs. When I

turn to analysing the drivers behind attempted market manipulation, it appears to be procyclical, but not systematically related to compensation schemes of top management, either.

Overall, the results presented in this section somewhat support the view that bank conduct failures react to compensation schemes, but this does not hold for all types of misconduct. Although the effects of CEO compensation are in general positive but not statistically significant, it appears that their effects are stronger in periods of high growth. Meanwhile, it has to be acknowledged that the sample size used for this analysis is small and the data on misconduct is noisy. The classes of misconduct used to distinguish between different types of malpractice are still broad, therefore summarising events that might result from different incentives. The imperfect information on exact initiation dates of bank malpractices might also reduce the precision with which the effects are estimated, especially when such cases last for extended time periods.

4. The model

In this section, I introduce a model which helps explain the positive relationship between bank managers' bonuses and misconduct, and why this relationship might be strongest when there are profitable investment opportunities and banks are leveraged.

4.1. Model Setup

The model has three periods ($t = 0, 1, 2$) and there are two types of risk-neutral agents: bank shareholders (he) and managers (she). At t=0, bank shareholders hire managers to implement projects and managers make the choice over which projects to invest in and whether to engage in misconduct. At t=1, the short-term returns of projects are realised. At t=2, the long-term risk of investment projects is realised, and misconduct results in disciplinary action by the regulator if detected.

Bank Shareholders and Projects

Bank shareholders have funds that can be invested in a risky or a safe project. In the baseline model, the bank is fully equity-financed and the funds that are invested are set to zero.

Project returns have two components: their distribution over time and riskiness. Projects generate payoffs in two periods, t=1 and t=2, where t=2 returns are discounted by the time value of money in the economy, δ. At t=1, the safe project pays H with probability p_L and L otherwise, and the risky project pays H with probability p_H and L otherwise. As $H>L$ and $p_H>p_L$, the risky project has higher expected payoffs in the

short run. However, it involves long-term risk: while the safe project pays L at t=2 with certainty, the risky project generates L only with probability 0<x<1 at t=2 (and 0 otherwise). Project payoffs are depicted in Figure 3.

As in this setting bank returns are distributed over time, it differs from models in which risky bank payoffs are assumed to be realised at a single future date. Although this might be not representative of some business lines in financial institutions, it captures bank activities that generate short-term cash flows but entail the risk of losses in the long run. As noted by Acharya et al. (2016), the feature of earning a carry in the short run while entailing long-term risks is present in many financial products: mortgage backed securities, credit default swaps, insurance instruments.

The risky project has a higher net present value (NPV) when

$$p_H H + (1 - p_H)L + \delta x L > p_L H + (1 - p_L)L + \delta L.$$

The condition can be rewritten to show that the risky project is more profitable when its short-term returns outweigh long-term risks:

$$(p_H - p_L)(H - L) > \delta(1 - x)L. \tag{1}$$

In condition (1), the left-hand side represents the gain from a higher probability of observing returns H rather than L if the risky investment is made. The right-hand side is the present value of expected loss L if long-term risk is realized.

Condition (1) can be related to the preceding empirical analysis. Growth periods correspond to times when there are profitable investment opportunities such as investments in mortgage-backed securities or technology stock, which also carry long-term risks. When the gains from investing in such projects are sufficiently low, (1) is not satisfied and banks shift to safer investments such as government bonds.

Finally, to carry out investment projects, bank shareholders have to hire a manager who chooses and implements the project. Manager project choice is not observable to shareholders, but its payoffs are. The bank can commit to a remuneration scheme that is dependent on observed returns, and cannot promise any payment to the manager when bank returns are 0. Shareholder objective is to maximise bank profits which depend on project returns at t=1 and t=2, manager compensation expenses, and conduct costs described below.

Managers

Bank managers live for three periods and have the objective to maximise their expected lifetime income. At t=0, managers are offered employment contracts by bank sharehold-

ers that specify their compensation at t=1 and t=2. The cost of project supervision is the same for all managers and is normalised to 0. Managers have a lifetime reservation wage w and discount their t=2 income using the time value of money in the economy, δ.

Misconduct

Besides to choosing project type, managers can engage in misconduct which increases the probability of generating high return H at t=1 by Δ. The two choices that the manager makes - which project to implement and whether to engage in misconduct - are independent, although it will be later shown that they can be related. Also, contrary to models where agency conflicts result in excessive risk taking by managers, here misconduct does not affect the riskiness of the bank's investment project, but rather increases the short-term payoffs realised. Instances of such behaviour are selling unsuitable products to consumers to increase commission wages, engaging in insider trading to boost profits, collusion or underwriting fraud. It is assumed that misconduct is socially costly: the cost of misconduct to bank customers is $\eta\Delta(H-L)$ where $\eta>1$, and so misconduct is not just redistribution of income from bank customers to shareholders.[10]

If managers decide to engage in misconduct, regulators detect it at t=2 with probability $0<\lambda<1$. If detected, managers who engage in misconduct lose their job and remuneration at t=2. This form of sanction mimics real world where misbehaving employees lose their reputation and are barred by regulators or fired by the banks themselves.[11] I assume that in this case, the manager's compensation at t=2 is appropriated by the regulator rather than retained by bank shareholders.[12] The assumption of misconduct costs being borne only at t=2 rather than immediately at t=1 is motivated by the time lag between malpractice initiation and resulting disciplinary actions observed in Section 3. Misconduct is also not detected with certainty, which could result from resource constraints faced by regulators.

If manager misconduct is detected at t=2, it also results in regulatory fines and/or restitution C paid by shareholders. The assumption of misconduct resulting in costs to bank shareholders is consistent with the observed regulatory actions in which financial costs are mostly borne by financial institutions rather than individuals. Therefore, from bank shareholder perspective, detection risk λ and conduct costs C are substitutes in

[10] This assumption could be motivated by the costs of legal processes, bank customer risk aversion, or the externalities related to bank misconduct reducing confidence in the financial sector.

[11] Egan et al. (2016) show that around half of financial advisers lose jobs after misconduct detection

[12] It could also be viewed as a claw-back or financial penalty where the manager's pay is seized by regulators if improper past actions are detected. While in this case, only t=2 income is clawed back and t=1 income resulting from the realisation of return H would be more reminiscent of such regulations, it can be argued that an agent's t=1 income is consumed and she has limited liability.

making misconduct costly. Even if regulators face constraints in detecting malpractice by managers, they can impose high financial penalties on shareholders. Meanwhile, bank managers can only lose their $t = 2$ compensation.

In the baseline model, contrary to bank managers who only incur costs when the long-term risk of the project does not materialise, shareholders are assumed to be subject to C irrespective of bank returns at t=2. Although the risky project yields 0 with probability $1 - x$, the model considers the bank incurring costs in those states, as well. This could be income from other projects that the bank undertakes, reputation losses or a result of delayed judicial process in which case costs are imposed after t=2. In an extension, I consider the case where bank shareholders are subject to conduct costs only when positive returns are realised at t=2.

In the baseline model, it is further assumed that misconduct has a negative NPV to bank shareholders: the increased probability of observing high return H rather than L by probability Δ due to manager's misconduct is outweighed by regulatory costs if detected with probability λ:

Assumption 1: $\Delta(H - L) < \delta\lambda C$.

In practice, there is no clear consensus over whether conduct failures in banks are encouraged by shareholders or resorted to by managers themselves. While some argue that bank shareholders allow such cases and realise positive returns from misconduct, at least some cases appear to have resulted from manager incentives to boost their short-term profits at a cost to bank owners. For example, the currency exchange manipulations in Barclays and UBS were carried by employees after the banks had reached non-prosecution agreements with regulators, breaching them and resulting in high fines. Similarly, a Barclays trader Daniel James Plunkett attempted to fix gold prices the day after his bank was fined for rigging Libor rates, resulting in a 44 million US dollars fine to the bank's shareholders, possibly outweighing the potential gains.

Finally, in the model bank shareholders can only prevent misconduct by changing compensation schemes and reducing the incentives of managers to initiate malpractice. Therefore, they cannot prevent or detect fraud by changing internal controls or governance. This assumption is consistent with the findings by Dyck et al. (2010) who have shown that the traditional corporate governance bodies are not the main detectors of fraud in corporations.[13]

Time line

t=0: The risk and returns of the risky and safe projects are observed. Bank shareholders offer contracts to managers, specifying their remuneration at t=1 and t=2. Managers

[13] But also see Nguyen et al. (2016) who show that board quality matters in detecting and preventing compliance failures in banks.

choose between implementing the risky and safe project, and choose whether to engage in misconduct.

t=1: The short-term returns of the project chosen by the manager are realised. Bank managers receive their t=1 compensation as specified in the contract.

t=2: Long-term risk is realised, and the manager receives her t=2 compensation. If misconduct was implemented at t=0, it gets detected with probability λ, resulting in the manager losing her t=2 compensation and costs C to bank shareholders.

The time line is summarised in Figure 4.

4.2. Baseline Results

I start by solving the model in which bank managers cannot engage in misconduct. It allows to derive manager incentive schemes that result in the safe or risky project being implemented and establish which projects would be chosen in the absence of bank malpractice. Later, misconduct is introduced to show the conditions under which managers prefer to engage in malpractice and it cannot be prevented by bank shareholders, and how this affects bank project choice.

In cases when managers cannot engage in misconduct, bank shareholders compare the returns of the risky and safe project net of manager compensation costs, and design the remuneration scheme so that the profit-maximising project is chosen by the manager.

The bank cannot commit to pay anything to the manager if the risky project is implemented and returns are zero at t=2. Therefore, if manager pay was not dependent on observing H or L at t=1 and t=2 wages were higher than zero, she would always choose to implement the safe project as it increases the probability of receiving compensation at t=2.

I rule out the case of bank shareholders inducing risk-taking just by promising the manager's reservation wage at t=1 and making her project choice independent of returns at $t = 2$. I assume that if indifferent between the risky and the safe project, the manager chooses the safe one. This restriction could also be rationalised if bank managers are required to stay in the bank for project supervision at t=1 and t=2, and if paid the reservation wage at t=1, they would prefer not to work with an arbitrarily small effort cost.

If bank shareholders prefer the risky project to be implemented, they have to offer higher compensation in cases when H is observed at t=1. Namely, denoting the manager's remuneration at t=1 after H is observed as α and t=2 compensation as β, the manager would choose to implement the risky project when her participation constraint (PC) and incentive compatibility constraint (ICC) are satisfied:

$$p_H\alpha + \delta x\beta \geq w \qquad \text{(PC)}$$

$$p_H\alpha + \delta x\beta > p_L\alpha + \delta\beta \tag{ICC}$$

From the (ICC), performance pay α which ensures that the risky project is implemented is

$$\alpha > \frac{\delta(1-x)\beta}{p_H - p_L}, \tag{2}$$

which shows that increasing risk $(1-x)$ requires higher short-term compensation to induce risk-taking, especially if the manager's losses in terms of deferred pay β are high. Further setting the (PC) so that the manager's participation constraint is just satisfied, minimal variable pay that ensures risky project choice at t=0 can be derived. Solving for β from the (PC) and substituting it in the condition for α in (2) and rearranging, the manager chooses the risky project if $\alpha > \frac{(1-x)w}{p_H - xp_L}$. As

$$\frac{\partial\alpha}{\partial x} = \frac{-w(p_H - p_L)}{(p_H - xp_L)^2}, \tag{3}$$

to induce risk-taking, α, the variable pay conditional on observing H, has to increase when project risk increases (and x diminishes). Meanwhile, α is decreasing in $p_H - p_L$ since for a given risk of receiving no returns at t=2, she is compensated at t=1 more often when the risky project is implemented. Finally, the effects of increasing risk are also stronger when manager reservation wages w are high. This result indicates a positive positive relationship between bank bonuses and competition for managers that increases their reservation wages w similarly to the findings in Thanassoulis (2013). There, higher future discounting by managers might lead to increasingly high short-term pay when their reservation wages increase, while in this model, the relationship between competition for managers and bonuses could arise because of the need for higher performance pay to induce risk-taking when manager reservation wages are high.

If the manager's PC is just satisfied, the condition under which bank shareholders prefer the risky project to be implemented coincides with the socially optimal choice in (1):

$$p_H H + (1-p_H)L + \delta xL - w > p_L H + (1-p_L)L + \delta L - w. \tag{4}$$

As in this setting the bank is fully equity financed, it will choose the project with higher expected returns. The condition further reduces to the threshold value of x, the probability of observing returns L at t=2, or maximum risk that shareholders are willing to bear:

$$x \geq \frac{\delta L - (p_H - p_L)(H - L)}{\delta L} \equiv \underline{x}. \tag{5}$$

Bank shareholders are willing to accept higher long-term risk, or lower x, when the gains in returns are sufficiently high, $\underline{x}$ decreasing in $(p_H - p_L)(H - L)$.

Bank misconduct

As introduced in the model setup, misconduct decision is made by the manager. I do not constrain her choice to engage is misconduct by making it dependent on project type and she can initiate malpractice either if the risky or the safe project is implemented.

The manager has an incentive to engage in misconduct at t=0 when her gains from increasing the likelihood of observing the high return H by Δ at t=1 outweigh the costs of regulatory actions at t=2. Such incentives depend on compensation schemes, which in turn depend on whether bank shareholders want to encourage risk-taking.

When the *safe* project is implemented, the manager prefers not to engage in misconduct when

$$(p_L + \Delta)\alpha + \delta(1-\lambda)\beta < p_L\alpha + \delta\beta,$$

or her gains in observing α with a higher probability are outweighed by expected costs resulting from detection:

$$\Delta\alpha < \delta\lambda\beta. \tag{6}$$

Condition (6) is satisfied when α is sufficiently low: $\alpha < \frac{\delta\lambda\beta}{\Delta}$. Similarly, when *risky* projects are profitable and shareholders favour risk-taking, conditional pay does not create incentives for misconduct by managers when

$$(p_H + \Delta)\alpha + \delta x(1-\lambda)\beta < p_H\alpha + \delta x\beta,$$

which results in a trade-off similar to that in (6):

$$\Delta\alpha < \delta x\lambda\beta. \tag{7}$$

From (7), the manager prefers not to engage in misconduct when $\alpha < \frac{\delta\lambda x\beta}{\Delta}$. Comparing this with the condition for α when the safe project is implemented in (6), managers have stronger incentives to engage in misconduct when the risky project is implemented. This results from the manager incurring the associated costs only when the long-term risk is not realised, very high project risk $(1-x)$ implying she almost never gets sanctioned for misconduct.

By Assumption 1 misconduct is costly to bank shareholders and they can only prevent it by changing manager compensation schemes. Therefore, to discourage malpractice, α should be set so that (6) and (7) are satisfied when the safe and risky projects are implemented, respectively.

However, satisfying the two conditions is not always feasible, leading to the main trade-off faced by bank shareholders when misconduct is costly. First, suppose the safe project has a higher NPV, or $x < \underline{x}$. In this case, the manager's ICC does not have to

be satisfied and performance pay can be freely set at $\alpha < \frac{\delta\lambda\beta}{\Delta}$, satisfying condition (6). On the other hand, if bank shareholders prefer the risky project to be implemented, it requires that $\alpha > \frac{\delta(1-x)\beta}{p_H - p_L}$ from the manager's ICC, while the condition of no misconduct when the risky project is implemented in (7) is $\alpha < \frac{\delta\lambda x\beta}{\Delta}$. The two conditions can be satisfied when

$$\frac{\delta(1-x)\beta}{p_H - p_L} < \frac{\delta\lambda x\beta}{\Delta}. \tag{8}$$

(8) shows that encouraging risk-taking and preventing misconduct is feasible when the short-term compensation that managers demand for the risk of foregoing deferred pay (left-hand side) is lower than the short-term pay for which the manager is willing to trade-off her $t = 2$ pay in case of misconduct. However, when long-term risks rise (x diminishes), α required to fulfil the manager's ICC increases on the left-hand side of the equation, while misconduct becomes more attractive on the right-hand side, as expected costs from misconduct detection diminish. Solving for x under which (8) does not hold leads to Proposition 1.

Proposition 1: when $x < \frac{\Delta}{\Delta+\lambda(p_h-p_L)} \equiv x^M(\lambda)$, bank shareholders cannot both incentivise risk-taking and prevent misconduct. When long-term risks associated with the risky project increase (x decreases), higher short-term performance pay α is required to compensate managers for future risks. This in turn raises the gains from malpractice that boosts the likelihood of receiving α beyond p_H, while expected detection costs decrease. Consistently with Becker's (1968) framework of the economics of crime, threshold x increases in Δ, the efficiency of misconduct, and decreases in λ, the frequency of detection: increasing gains from misconduct make preventing it harder, while increasing the associated costs to managers allow bank shareholders to prevent misconduct and implement the risky project at relatively low levels of x.

These results imply that even if the manager can engage in malpractice when both the risky and the safe project is implemented, we might observe more misconduct at times when banks take more risk. When safe projects yield higher returns, shareholder incentive schemes can be shifted from short-term compensation to deferred pay more easily, preventing malpractice. In cases when risky projects have a higher NPV, misconduct is harder to prevent as both higher performance pay necessary to encourage risk-taking and lower expected costs from misconduct make it more attractive to managers.

Regulation, Risk and Project Choice

When bank managers have the opportunity to engage in misconduct, shareholder choice between the safe and the risky project depends not only on their respective returns, but can also be affected by the probability of detection and conduct costs imposed by

regulators. The resulting risk and misconduct outcomes are considered below.

Case 1: $x > x^M(\lambda)$**.** In this case, misconduct can be prevented and bank shareholders prefer the socially optimal project, incentivising managers to invest in the risky project when $x > \underline{x}$ and choosing the safe project otherwise.

Case 2: $x < x^M(\lambda)$**.** When the risk of detection cannot prevent managers from engaging in misconduct, shareholders prefer the risky project over the safe one when

$$(p_H + \Delta)H + (1 - p_H - \Delta)L + \delta xL - \delta x\lambda C > p_L H + (1 - p_L)L + \delta L.$$

To evaluate how shareholder incentives change when managers engage in misconduct, it can be rearranged to

$$(p_h + \Delta - p_L)(H - L) > \delta(1 - x)L + \delta\lambda C. \tag{9}$$

Comparing to (1), the left-hand side of (9) now increases by $\Delta(H - L)$ as malpractice boosts bank payoffs in the short run. However, it also increases the long-term costs on the right-hand side, the term $\delta\lambda C$ representing expected financial penalties imposed by regulators.

As it is assumed that $\Delta(H - L) < \delta\lambda C$, the short-term gains from risky project implementation now diminish relative to long-term costs, making the risky project less attractive. The resulting new threshold x for risky project implementation in this case changes to $x > \frac{\delta L - (p_h - p_L)(H-L) + (\delta\lambda C - \Delta(H-L))}{\delta L} \equiv \underline{x}^S(\lambda) > \underline{x}$. Therefore, conduct costs can reduce bank risk-taking when conduct costs C are high.

The reason why detection probability that is not sufficiently high to prevent misconduct can change the incentives of shareholders is due to conduct costs that the regulators can impose. As financial penalties and the probability of being subject to disciplinary actions are substitutes in making misconduct costly to bank shareholders, sufficiently high levels of financial penalties can fully eliminate risky project implementation and malpractice even if detection risk is low.

In Figure 5, I illustrate how combinations of risk $(1 - x)$ and detection probability λ affect project choice and misconduct. When x, the probability of the risky project generating payoffs in the long-run, is low, the safe project is implemented irrespectively of the intensity of misconduct detection. There, shareholders do not need performance pay to encourage risk-taking, and can defer the manager's compensation, making malpractice costly to her. When the risky project has a higher NPV, $x^M(\lambda)$ separates the region in which the risk of detection can prevent manager misconduct from the region where risky investments result in malpractice. When $x < x^M(\lambda)$ and detection probability is not sufficiently high to deter manager misconduct for a given level of risk

and associated performance pay, project choice depends on expected conduct costs to bank shareholders. In this case, risky projects are profitable when, holding C constant, detection risk is sufficiently low and $x > \underline{x}^S(\lambda)$.

4.3. Extensions

Constraining costs to bank shareholders

In this extension, I consider the case in which conduct costs C that regulators can impose on bank shareholders are limited to bank returns realised at t=2. This assumption might be realistic in situations where regulators are reluctant to impose fines on poorly capitalised banks, or when banks default if their returns are zero.

This assumption alters only conduct costs to shareholders, as the manager's decision to initiate malpractice is not affected by financial penalties. When the safe project is implemented, shareholders face the same costs from misconduct as in the baseline model since the safe project always yields returns at $t = 2$, misconduct being costly when

$$\Delta(H - L) < \delta\lambda C.$$

Assuming that Assumption 1 still holds even when $C \leq L$, misconduct is not profitable to bank shareholders when the safe project is implemented, and they prefer to defer manager's compensation in order to prevent it. When the risky project is implemented, misconduct is costly to shareholders when

$$\Delta(H - L) < \delta x\lambda C. \tag{10}$$

As higher long-term risk diminishes expected conduct costs, shareholders find malpractice more profitable as risk increases. Condition (10) can again be expressed in terms of project risk, $x < \frac{\Delta(H-L)}{\delta\lambda C} \equiv x^S(\lambda)$ resulting in misconduct being profitable to bank shareholders when the risky project is implemented.

We can now compare $x^S(\lambda)$ to condition $x^M(\lambda)$ from Proposition 1 which defines risk levels above which the manager's malpractice cannot be prevented in the baseline model. Misconduct is costly to shareholders but cannot be prevented when $x^S(\lambda) < x < x^M(\lambda)$. Rearranging, it can be shown that $x^S(\lambda) < x^M(\lambda)$ when

$$\frac{\Delta(H - L)}{\lambda\delta L} < \frac{\delta C - (p_H - p_L)(H - L)}{\delta L}. \tag{11}$$

Noting that the left-hand side of (11) is the condition for misconduct being profitable to shareholders and the right-hand side is the threshold value of x below which the safe projects have higher NPV than the risky ones when $C = L$, it is never the case

that misconduct is costly to bank shareholders and cannot be prevented when the risky project is implemented, as the maximum conduct costs that can be imposed on shareholders are L.

Furthermore, when $x^M(\lambda) < x < x^S(\lambda)$, misconduct is now attractive to shareholders at risk levels at which it could have be prevented in the baseline model by setting performance pay α sufficiently low while still satisfying the manager's ICC for risky project implementation.

These results imply that when risky projects have a higher NPV, limits on the costs that regulators can impose on banks can increase the prevalence of conduct failures. While in the baseline model shareholders could not prevent misconduct for $x < x^M(\lambda)$, they find it profitable in this extension. Furthermore, as shareholders prefer misconduct for risk levels at which it could have been prevented previously through setting α to satisfy (7), now they have incentives to increase α beyond the level required to induce manager's risk-taking in order to encourage the initiation of malpractice.

Does misconduct affect project choice when bank shareholders face a lower risk of financial penalties? First, as misconduct is never costly to shareholders when $x < x^S$, it does not reduce the profitability of risky project implementation in the region $\underline{x} < x < x^M(\lambda)$ under which it could not be prevented in the baseline model. Second, as expected conduct costs are lower when the risky project is implemented, fines being imposed only with probability x, misconduct increases the gains from risk-taking, or the two become complements. Shareholders now prefer the risky project when

$$(p_h + \Delta - p_L)(H - L) > \delta(1 - x)L + x\delta\lambda C. \tag{12}$$

The condition is similar (9) in the baseline model, however here, misconduct increases the profitability of risky projects since malpractice results in conduct costs in the long run only with probability x. The resulting threshold risk level making the safe project more profitable is now $x < \frac{\delta L - \delta\lambda C - (p_H + \Delta - p_L)(H-L)}{\delta L - \delta\lambda C} \equiv \underline{x}'(\lambda) < \underline{x}$, shareholders implementing the risky projects even when the safe project has a higher NPV.

Therefore, when the costs that regulators can impose on bank shareholders are constrained by their returns at t=2, it leads to both more misconduct and risk-taking. Figure 6 illustrates the resulting project choice and misconduct intensity for combinations of project risk and detection probability.

Bank leverage

Empirical evidence presented in Section 3 suggests that bank leverage might be positively related to misconduct, and that short-term incentive schemes have stronger effects when bank leverage increases. As in the baseline model it is assumed that the bank

is fully equity-funded, in this extension I consider the case in which the bank takes on debt. I assume that each project now costs one unit to invest, and the bank funds D of it with insured deposits that have to be repaid at t=2. It is further assumed that $L - \beta > D$, or the bank does not have sufficient returns to repay its depositors at t=2 only if the risky project is chosen and bank returns are zero.

Assuming again that misconduct is costly to bank shareholders, when $x > x^M$ and misconduct can be prevented, shareholders prefer the risky project when

$$(p_h - p_L)(H - L) > \delta(1 - x)(L - D). \tag{13}$$

Comparing to the baseline case, debt makes risky projects more profitable through reducing shareholder losses in case long-term risk is realised at t=2. The result is akin to traditional risk-shifting where leverage increases the attractiveness of the risky project as part of the cost from implementing it is now borne by creditors. Rewriting in terms of risk $1 - x$ that shareholders are willing to bear, leverage shifts the threshold x down to $\underline{x}^D = \frac{\delta(L-D)-(p_H-p_L)(H-L)}{\delta(L-D)} < \underline{x}$ with $\frac{\partial \underline{x}^D}{\partial D} < 0$.

When $x < x^M(\lambda)$ and the implementation of the risky project results in conduct costs to bank shareholders, they prefer it to the safe project when

$$(p_h + \Delta - p_L)(H - L) > \delta(1 - x)(L - D) + \delta\lambda C. \tag{14}$$

Comparing this to condition (9), debt reduces the negative effects of malpractice on the profitability of risky projects through risk-shifting. This results in risk-taking for values of x at which the risky project had a higher NPV, but was unattractive due to conduct costs in the baseline model.

The effects of leverage on bank malpractice and risk-taking are presented in Figure 7. Leverage leads to more risk-taking and misconduct both through making risky projects more profitable relative to the safe ones due to risk-shifting, and encouraging risk-taking in cases where the safe project might have been preferred because of the conduct costs resulting from managers' malpractice.[14]

5. Discussion and Conclusion

This paper has attempted to gather and examine data on bank malpractice initiation in order to assess its developments over time, and the extent to which misconduct relates to bank incentive schemes and economic conditions. It appears that misconduct is quite

[14] Another possible effect of bank debt D on misconduct that is not modelled here works through reducing financial penalties C that regulators are willing to impose on bank shareholders, reinforcing the positive relationship between bank misconduct and risk-taking.

persistent and might have been increasing lately. I also find some evidence that certain types of misconduct are positively related to bank CEO bonuses, especially in periods of high economic growth.

The findings of the paper are important for better understanding the drivers behind bank conduct failures and designing policies to prevent them. The observed procyclicality of misconduct might imply that regulators should be more vigilant during economic upturns. Meanwhile, the somewhat limited evidence on the relationship between bank compensation and malpractice is relevant in the light of recent initiatives to prevent it through regulating bankers' pay.

Namely, the empirical results provided in this paper could be taken as evidence supporting the view that compensation schemes in banks and misconduct are related, and therefore pay regulations might be effective in preventing conduct failures in financial institutions. For example, the positive relationship between bank CEO bonuses and misconduct intensity during periods of high growth might imply that restricting short-term payouts and postponing compensation could reduce managers' incentives to engage in socially costly activities that boost short-term profits. The results in the theoretical model suggest that such regulations might be especially useful when compensation schemes in banks are designed to incentivise manager misconduct rather than in order to achieve other shareholder objectives.

However, one of the implications of the theoretical model is that regulating managers' pay or the imposition of increasingly high financial penalties can be costly. If manager compensation schemes are designed to achieve shareholder objectives other than encouraging malpractice, imposing constraints on pay might result in lower value projects being implemented. Similarly, the imposition of high conduct costs can reduce misconduct through encouraging shareholders to change compensation schemes, but it also results in sub-optimal project choice. In such cases, increasing the risk of detection eliminates manager incentives to initiate malpractice without changing bank investment choices.

Overall, the theoretical framework suggests that the extent to which misconduct results from incentive schemes designed to achieve shareholder objectives other than encouraging malpractice should be an important factor when thinking about regulating compensation in banks. Therefore, attempting to quantify the gains of bank shareholders from misconduct might be a possible direction for future research. Also, as it has been acknowledged that the data used in empirical analysis has several shortcomings related to its availability, challenges in determining the initiation date, and only detected conduct failures being observed, the results should be interpreted carefully. Further work on designing a comprehensive database on bank conduct failures could be useful for a more detailed analysis of the drivers behind them.

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Figures and Tables

Figure 1: Bank Misconduct Initiations, Investigations and Fines

Notes: This figure plots the total number of misconduct cases and their investigations starting each year as well as the total number of fines imposed. The events are not grouped so that cases resulting in multiple actions receive more weight.

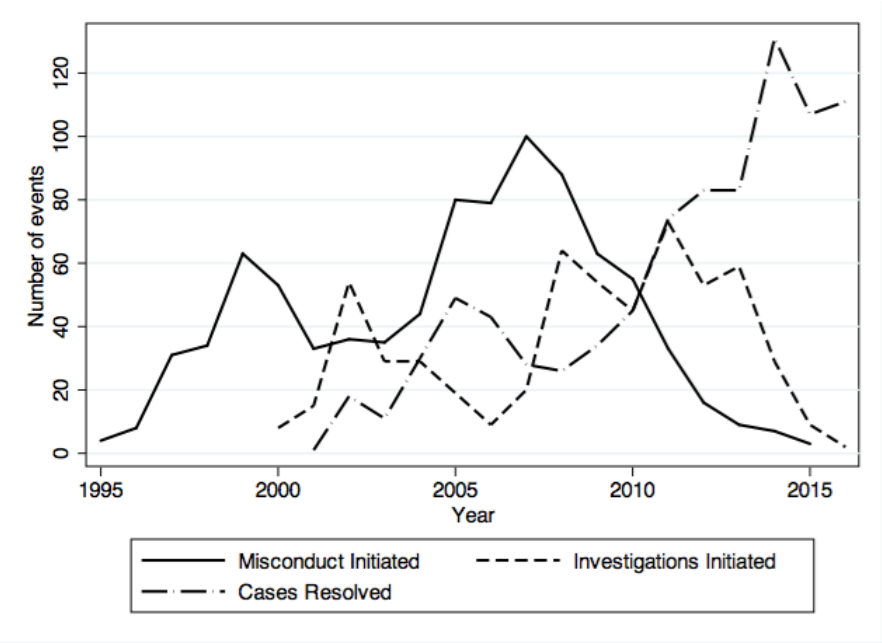

Figure 2: Share of cases resolved since the date of alleged start

Notes: This table presents the cumulative distribution of the time lag between alleged misconduct starts and the dates at which they resulted in conduct costs to banks.

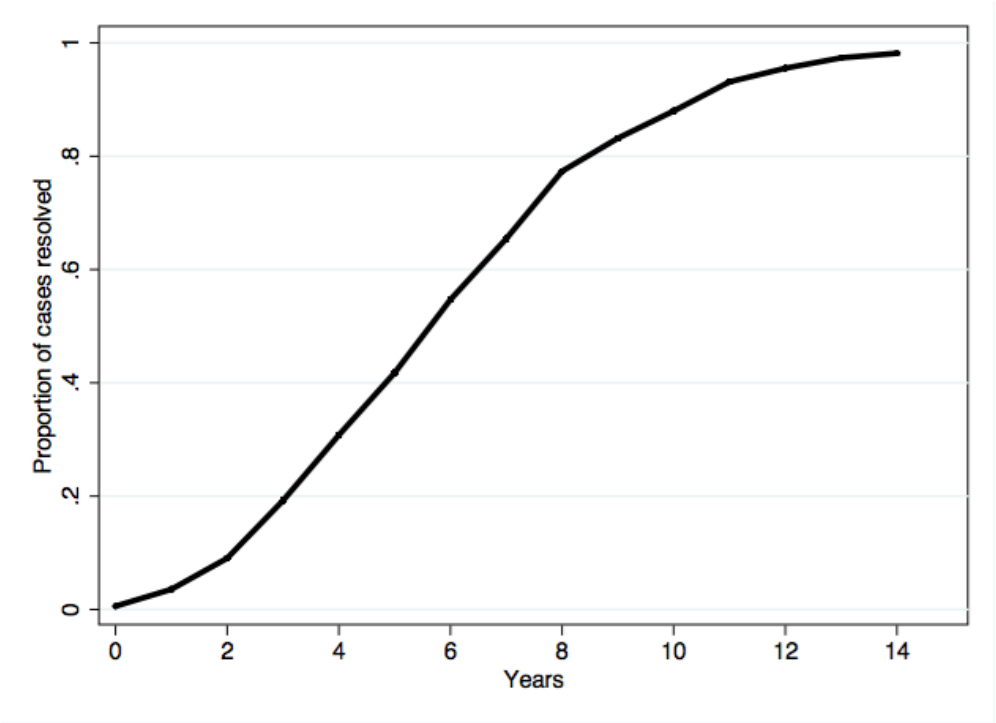

Figure 3: Project payoffs

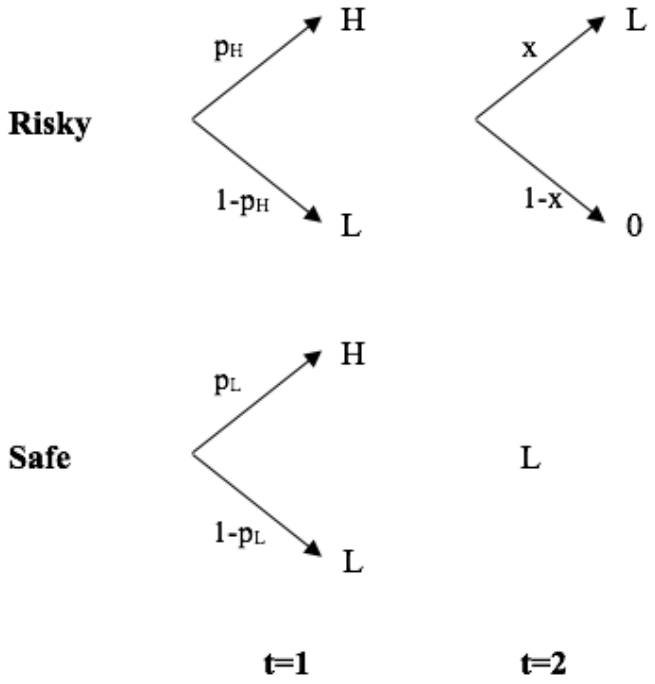

Figure 4: The timeline

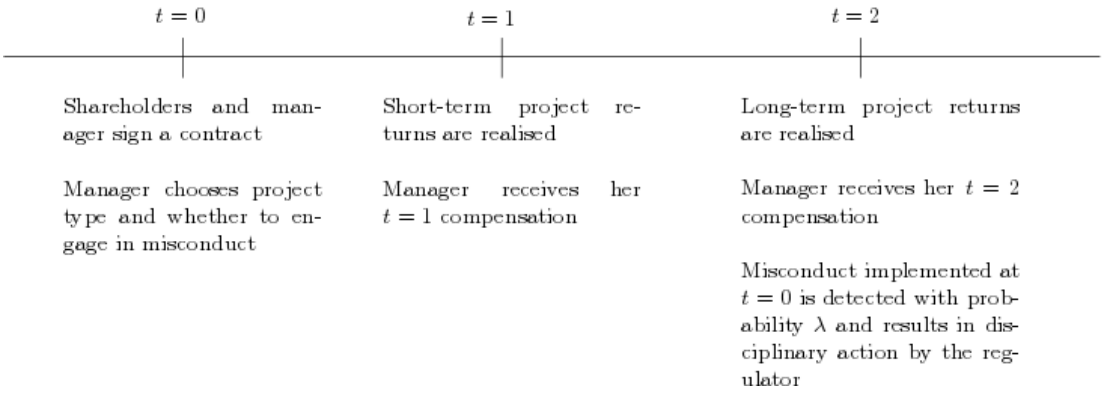

Figure 5: Misconduct, detection and project type

Notes: This figure presents the regions of bank risk-taking and misconduct that result from combinations of project risk and detection intensity in cases when misconduct is costly to bank shareholders.

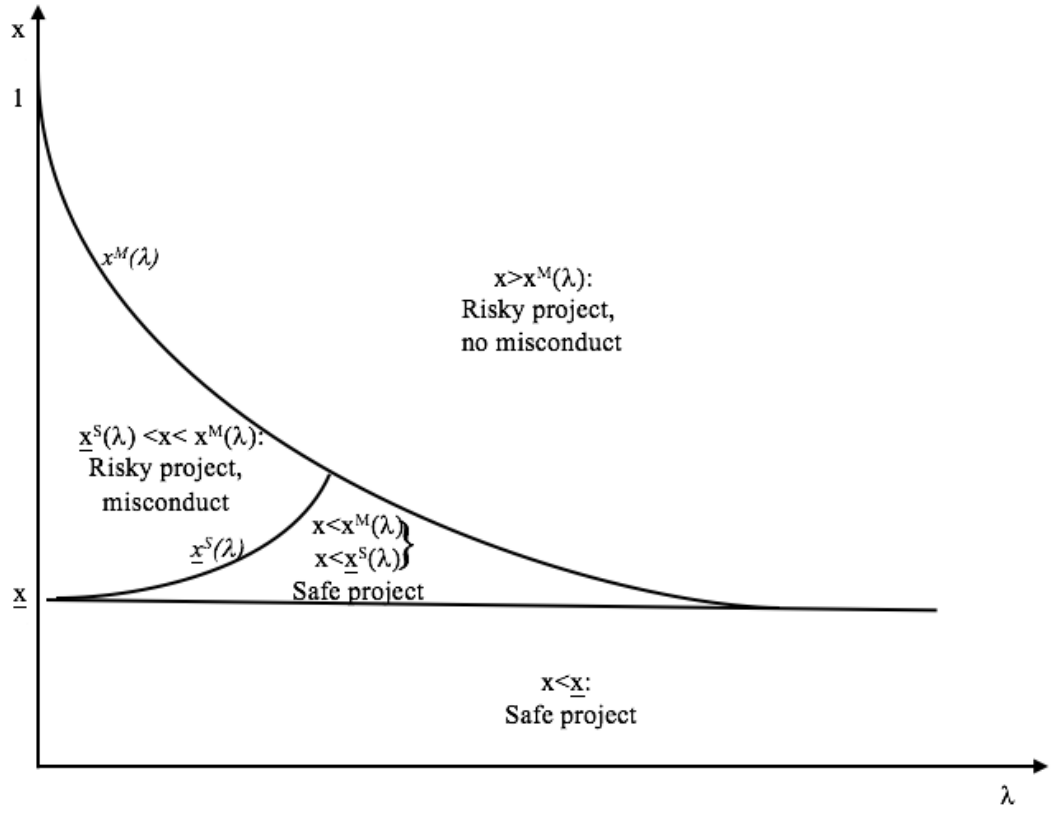

Figure 6: Misconduct and project type under low conduct costs

Notes: This figure presents the regions of bank risk-taking and misconduct that result from combinations of project risk and detection intensity in cases when bank shareholders are subject to conduct costs only if long-term risk at t=2 is not realised and the maximum amount of conduct costs is constrained by L, project return at t=2.

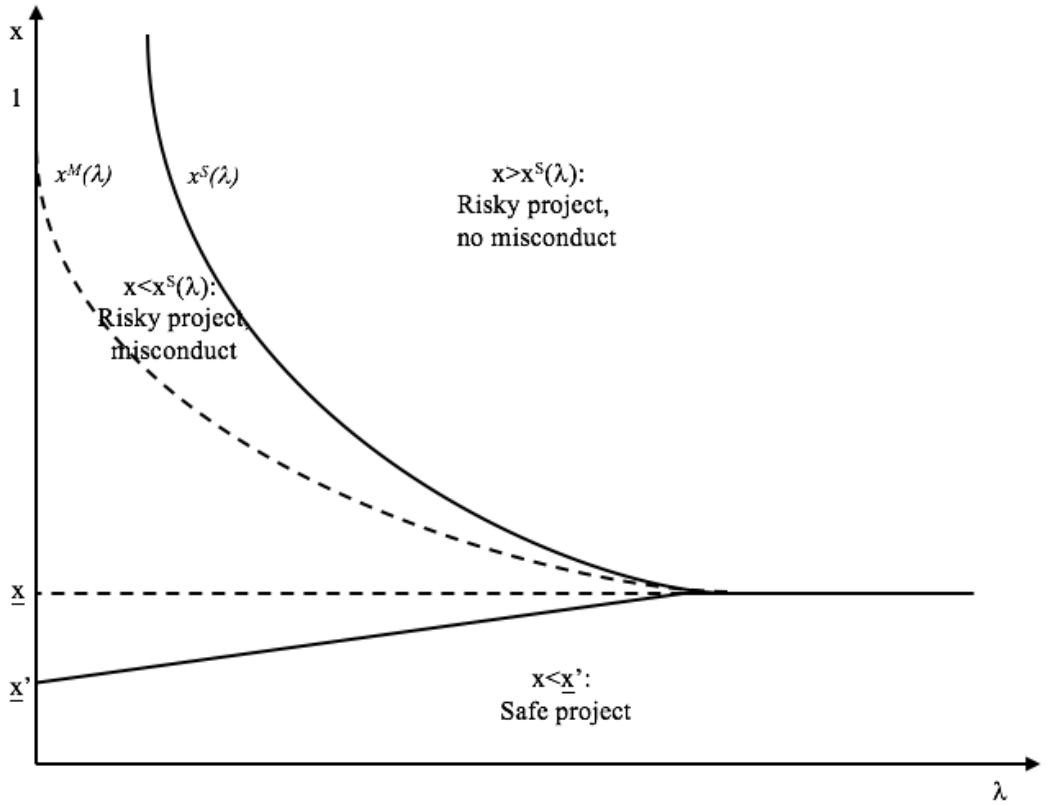

Figure 6: Misconduct and project type when the bank is leveraged.

Notes: This figure presents the regions of bank risk-taking and misconduct that result from combinations of project risk and detection intensity hwen misconduct is costly to bank shareholders and the bank is leveraged.

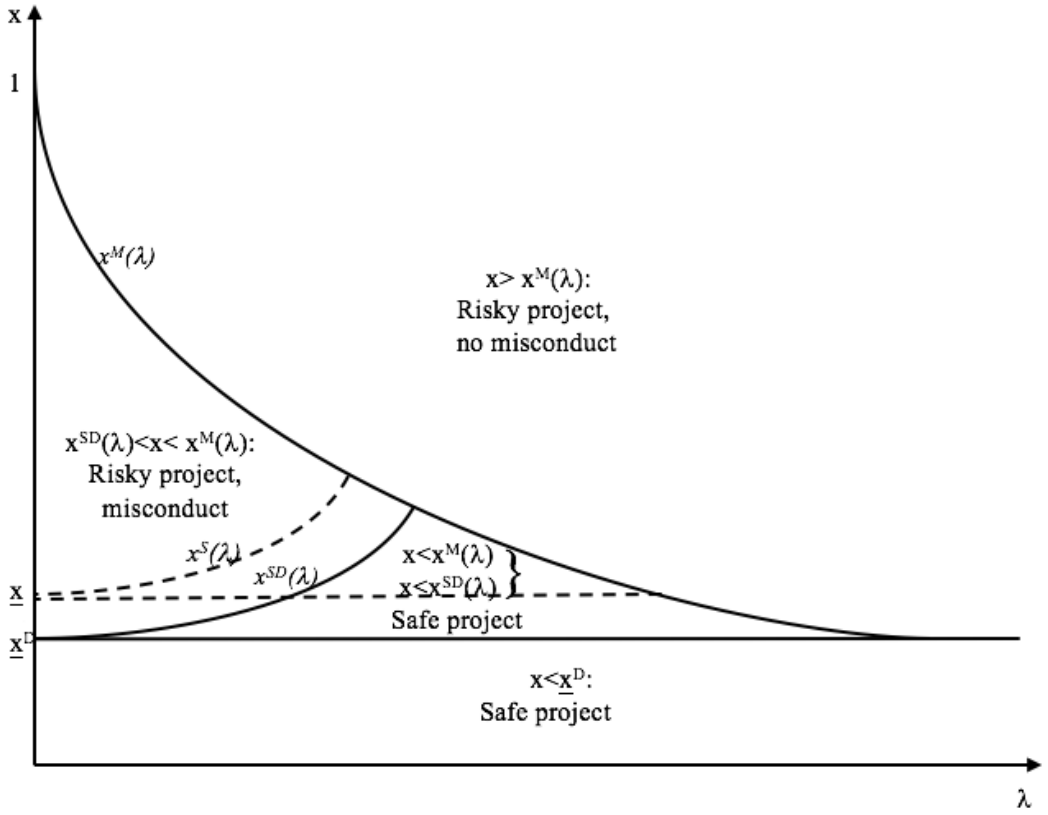

Table 1

Notes: This table presents the total number of misconduct cases initiated each year that have resulted in conduct costs of at least 1m US dollars in the sample of 30 banks during 2000-2016. Instances in which bank malpractices resulted in multiple actions by regulators or lawsuits are treated as a single case, the earliest initiation date available used in such cases.

Year	Total	Underwr.	Compl.	Manipul.	Abuse	Individ. Cases	Sanctions
1998	31	13	4	2	8	1	0
1999	51	19	12	4	6	2	2
2000	41	19	7	1	9	1	1
2001	30	2	7	0	14	1	1
2002	33	2	13	3	4	1	5
2003	28	2	4	3	14	0	3
2004	34	6	7	3	12	2	2
2005	43	13	3	7	7	3	6
2006	47	13	7	3	17	2	0
2007	71	3	18	10	22	9	4
2008	73	1	26	9	19	8	4
2009	53	0	15	8	19	3	0
2010	51	14	12	3	11	5	1
Total	586	107	135	56	162	38	29

Table 2

Notes: This table presents the total value of misconduct initiated each year measured in terms of resulting conduct costs (in m US dollars at 2010 prices). The data covers cases that have resulted in conduct costs of at least 1m US dollars in the sample of 30 banks during 2000-2016.

Year		Total	Underwr.	Compl.	Manipul.	Abuse	Individ. Cases	Sanctions
1998	**Sum**	**2303**	**1329**	**6**	**183**	**664**	**10**	**0**
	Mean	76.77	44.28	0.19	6.09	22.13	0.32	0
	Median	0.60	0	0	0	0	0	0
	S.d.	138.11	109.40	0.52	33.35	84.49	1.75	0
1999	**Sum**	**3115**	**1841**	**46**	**251**	**225**	**98**	**388**
	Mean	103.83	61.36	1.55	8.38	7.51	3.26	12.92
	Median	0	0	0	0	0	0	0
	S.d.	195.43	138.78	3.81	24.64	29.85	13.26	57
2000	**Sum**	**13235**	**9315**	**65**	**173**	**2214**	**2**	**845**
	Mean	441.17	310.48	2.17	5.78	73.78	0.08	28.15
	Median	26.45	0	0	0	0	0	0
	S.d.	1085.27	1019.32	6.39	31.67	202.94	0.45	154.21
2001	**Sum**	**3352**	**1496**	**51**	**0**	**1009**	**25**	**411**
	Mean	111.74	49.85	1.70	0	33.63	0.82	13.70
	Median	0.76	0	0	0	0	0	0
	S.d.	335.08	270.28	8.32	0	103.62	4.48	75.02
2002	**Sum**	**14230**	**957**	**185**	**300**	**918**	**0**	**10420**
	Mean	474.33	31.90	6.17	10.01	30.60	0	347.34
	Median	3.06	0	0	0	0	0	0
	S.d.	1892.73	139.50	15.67	33.37	158.69	0	1858.57
2003	**Sum**	**11373**	**8787**	**8**	**48**	**1408**	**0**	**880**
	Mean	379.10	292.91	0.26	1.61	46.93	0	29.33
	Median	11.87	0	0	0	0	0	0
	S.d.	1678.84	1509.87	0.70	5.23	167.94	0	159.64
2004	**Sum**	**1807**	**683**	**21**	**139**	**879**	**37**	**44**
	Mean	60.23	22.77	0.68	4.65	29.31	1.24	1.48
	Median	0	0	0	0	0	0	0
	S.d.	122.32	93.53	2.05	16.55	85.92	6.78	6
2005	**Sum**	**62886**	**54479**	**31**	**6535**	**854**	**1**	**376**
	Mean	2096.20	1815.97	1.02	217.83	28.45	0.04	12.52
	Median	22.60	0	0	0	0	0	0
	S.d.	5303.60	4953.85	3.73	676.65	84.68	0.20	34.07
2006	**Sum**	**27004**	**22520**	**103**	**1930**	**1835**	**20**	**0**
	Mean	900.13	750.65	3.44	64.34	61.15	0.68	0
	Median	86.05	0	0	0	0	0	0
	S.d.	3293.85	3301.94	14.20	174.70	226.94	3.40	0
2007	**Sum**	**12901**	**2677**	**383**	**4915**	**4457**	**379**	**26**
	Mean	430.04	89.24	12.77	163.84	148.56	12.63	0.87
	Median	84.83	0	0	0	0	0	0
	S.d.	582.02	207.59	36.76	316.41	269.72	60.55	4.36
2008	**Sum**	**36087**	**19**	**194**	**4951**	**27295**	**853**	**137**
	Mean	1202.91	0.62	6.46	165.04	909.83	28.44	4.56
	Median	24.44	0	0	0	0	0	0
	S.d.	3043.29	2.58	15.57	357.95	2669.07	83.99	19.11
2009	**Sum**	**7750**	**318**	**478**	**384**	**6187**	**9**	**0**
	Mean	258.32	10.60	15.93	12.80	206.25	0.28	0
	Median	21.20	0	0	0	0	0	0
	S.d.	551.86	58.07	78.14	21.96	520.65	1.31	0
2010	**Sum**	**5914**	**103**	**61**	**5281**	**324**	**62**	**4**
	Mean	197.12	3.44	2.05	176.05	10.81	2.07	0.12
	Median	7.79	0	0	0	0	0	0
	S.d.	560.92	9.29	5.31	554.50	38.49	9.03	0.64
Total	**Sum**	**201956**	**104523**	**1632**	**25092**	**48268**	**1495**	**13530**

Table 3

Notes: This table presents the total value of misconduct measured in terms of resulting conduct costs (in m US dollars at 2010 prices) initiated in each sample bank during the period 1998-2010. The data covers cases that have resulted in conduct costs of at least 1m US dollars in the sample of 30 banks during 2000-2016

Bank		Total	Underwr.	Compl.	Manipul.	Abuse	Individ. Cases	Sanctions
	Sum	**633**	**0**	**54**	**0**	**477**	**2**	**90**
AMERICAN EXPRESS CO	Mean	48.67	0	4.17	0	36.67	0.19	6.92
	Median	5.79	0	0	0	0	0	0
	S.d.	80.18	0	15.04	0	65.44	0.68	23.28
	Sum	**113**	**0**	**0**	**0**	**112**	**0**	**1**
BANCO SANTANDER SA	Mean	8.70	0	0	0	8.61	0	0.09
	Median	0	0	0	0	0	0	0
	S.d.	12.53	0	0	0	12.34	0	0.31
	Sum	**43144**	**26426**	**461**	**892**	**14439**	**1**	**31**
BANK OF AMERICA CORP	Mean	3318.79	2032.74	35.49	68.61	1110.69	0.11	2.38
	Median	507.81	0	0	0	3.33	0	0
	S.d.	5834.65	5163.73	118.39	139.15	3433.88	0.39	5.47
	Sum	**671**	**0**	**202**	**1**	**57**	**31**	**0**
BANK OF NEW YORK MELLON CORP	Mean	51.65	0	15.56	0.10	4.36	2.39	0
	Median	16.21	0	0	0	0	0	0
	S.d.	79.66	0	53.38	0.37	10.94	8.62	0
	Sum	**5119**	**326**	**91**	**4141**	**325**	**221**	**3**
BARCLAYS PLC	Mean	393.76	25.04	7.03	318.56	24.97	16.96	0.20
	Median	50.49	0	0	0	0	0	0
	S.d.	688.13	87.85	18.54	654.17	50.70	41.79	0.73
	Sum	**118**	**90**	**1**	**0**	**0**	**19**	**0**
BB&T CORP	Mean	9.06	6.90	0.08	0	0	1.43	0
	Median	0	0	0	0	0	0	0
	S.d.	29.88	24.87	0.29	0	0	5.15	0
	Sum	**10516**	**0**	**2**	**212**	**19**	**0**	**10186**
BNP PARIBAS	Mean	808.93	0	0.18	16.33	1.45	0	783.52
	Median	0	0	0	0	0	0	0
	S.d.	2845.94	0	0.66	40.17	4.72	0	2825.02
	Sum	**319**	**0**	**4**	**0**	**234**	**0**	**0**
CAPITAL ONE FINANCIAL CORP	Mean	24.53	0	0.28	0	17.98	0	0
	Median	0	0	0	0	0	0	0
	S.d.	59.42	0	1.01	0	57.56	0	0
	Sum	**24744**	**16055**	**89**	**3347**	**5121**	**104**	**17**
CITIGROUP INC	Mean	1903.39	1234.98	6.85	257.44	393.92	7.99	1.28
	Median	848.29	145.24	2.66	6.54	7.96	0	0
	S.d.	2657.29	2535.73	9.19	542.50	665.74	20.41	4.61
	Sum	**1268**	**0**	**15**	**277**	**0**	**0**	**976**
CREDIT AGRICOLE SA	Mean	97.54	0	1.18	21.31	0	0	75.05
	Median	0	0	0	0	0	0	0
	S.d.	239.88	0	4.24	52.40	0	0	241.85
	Sum	**3799**	**2180**	**20**	**64**	**422**	**651**	**334**
CREDIT SUISSE GROUP	Mean	292.20	167.71	1.55	4.95	32.43	50.09	25.68
	Median	210.22	13.54	0	0	0	0	0
	S.d.	355.21	284.94	4	13.98	116.92	121.98	65.13
	Sum	**17268**	**10552**	**109**	**3929**	**288**	**320**	**335**
DEUTSCHE BANK AG	Mean	1328.28	811.67	8.39	302.23	22.13	24.60	25.76
	Median	306.47	0	1.39	0	0	0	0
	S.d.	3575.85	2694.74	21.67	930.51	72.48	88.71	83.91
	Sum	**137**	**101**	**1**	**0**	**35**	**0**	**0**
FIFTH THIRD BANCORP	Mean	10.51	7.74	0.10	0	2.67	0	0
	Median	0	0	0	0	0	0	0
	S.d.	27.67	27.89	0.37	0	5.88	0	0
	Sum	**8049**	**7153**	**102**	**334**	**378**	**3**	**0**
GOLDMAN SACHS GROUP INC	Mean	619.14	550.21	7.82	25.68	29.07	0.25	0
	Median	88.98	8.58	1.94	0	0	0	0
	S.d.	1533.55	1545.79	11.97	43.75	91.63	0.62	0

Table 3 Continued

Bank		Total	Underwr.	Compl.	Manipul.	Abuse	Individ. Cases	Sanctions
	Sum	**2602**	**626**	**11**	**1020**	**806**	**0**	**16**
HSBC HLDGS PLC	Mean	200.15	48.18	0.82	78.47	62.01	0	1.19
	Median	35.57	0	0	0	0	0	0
	S.d.	397.58	172.84	2	187.66	173.09	0	3.99
	Sum	**25**	**0**	**1**	**0**	**23**	**0**	**0**
ING GROEP NV	Mean	1.90	0	0.09	0	1.80	0	0
	Median	0	0	0	0	0	0	0
	S.d.	6.04	0	0.34	0	6.06	0	0
	Sum	**46166**	**29672**	**110**	**3196**	**10341**	**28**	**98**
JPMORGAN CHASE & CO	Mean	3551.23	2282.46	8.45	245.85	795.47	2.17	7.53
	Median	1305.37	80.50	0	13.61	55.53	0	0
	S.d.	7225.87	6873.32	17.93	449.35	1741.28	6.80	27.14
	Sum	**677**	**0**	**0**	**407**	**209**	**0**	**0**
LLOYDS BANKING GROUP PLC	Mean	52.04	0	0	31.31	16.09	0	0
	Median	0	0	0	0	0	0	0
	S.d.	120.43	0	0	112.89	55.23	0	0
	Sum	**6496**	**5210**	**147**	**59**	**971**	**19**	**0**
MORGAN STANLEY	Mean	499.69	400.75	11.33	4.52	74.73	1.47	0
	Median	153.13	5.19	2.19	0	0	0	0
	S.d.	887.62	867	14.49	14.29	158.57	3.16	0
	Sum	**374**	**8**	**0**	**0**	**366**	**0**	**0**
PNC FINANCIAL SVC GROUP INC	Mean	28.78	0.61	0	0	28.18	0	0
	Median	0	0	0	0	0	0	0
	S.d.	55.27	2.18	0	0	55.56	0	0
	Sum	**4757**	**1245**	**16**	**3207**	**120**	**0**	**169**
ROYAL BANK OF SCOTLAND GROUP	Mean	365.90	95.79	1.20	246.70	9.23	0	12.98
	Median	55.25	0	0	0	0	0	0
	S.d.	619.61	226.24	2.71	456.92	20.25	0	31.80
	Sum	**410**	**0**	**2**	**0**	**408**	**0**	**0**
SCHWAB (CHARLES) CORP	Mean	31.57	0	0.19	0	31.38	0	0
	Median	0	0	0	0	0	0	0
	S.d.	113.08	0	0.47	0	113.14	0	0
	Sum	**826**	**0**	**11**	**726**	**12**	**77**	**0**
SOCIETE GENERALE GROUP	Mean	63.52	0	0.81	55.83	0.94	5.94	0
	Median	0	0	0	0	0	0	0
	S.d.	189.70	0	1.99	185.10	3.39	17.40	0
	Sum	**684**	**0**	**0**	**0**	**0**	**0**	**414**
STANDARD CHARTERED PLC	Mean	52.61	0	0	0	0	0	31.88
	Median	0	0	0	0	0	0	0
	S.d.	130.87	0	0	0	0	0	113.89
	Sum	**534**	**0**	**2**	**0**	**517**	**1**	**0**
STATE STREET COR	Mean	41.06	0	0.13	0	39.80	0.08	0
	Median	0	0	0	0	0	0	0
	S.d.	102.09	0	0.46	0	102.17	0.28	0
	Sum	**1772**	**328**	**5**	**0**	**1438**	**0**	**0**
SUNTRUST BANKS INC	Mean	136.28	25.22	0.41	0	110.65	0	0
	Median	1.70	0	0	0	0	0	0
	S.d.	407.87	70.16	0.79	0	341.72	0	0
	Sum	**730**	**0**	**15**	**0**	**311**	**1**	**0**
TORONTO DOMINION BANK	Mean	56.19	0	1.17	0	23.91	0.08	0
	Median	0	0	0	0	0	0	0
	S.d.	124.75	0	3.55	0	68	0.30	0
	Sum	**703**	**369**	**2**	**0**	**309**	**0**	**0**
US BANCORP	Mean	54.09	28.38	0.16	0	23.76	0	0
	Median	14	0	0	0	0	0	0
	S.d.	81.08	60.81	0.59	0	67.09	0	0
	Sum	**7488**	**2011**	**143**	**3279**	**1137**	**4**	**860**
UBS GROUP AG	Mean	576.02	154.70	11.02	252.26	87.44	0.30	66.17
	Median	120.89	13.34	5.31	0	0	0	0
	S.d.	792.49	273.96	20.74	472.15	272.70	1.10	233.93
	Sum	**11816**	**2173**	**14**	**0**	**9394**	**13**	**2**
WELLS FARGO & CO	Mean	908.94	167.13	1.06	0	722.62	0.98	0.14
	Median	241.43	0	0	0	185.31	0	0
	S.d.	1562.66	420.59	1.56	0	1538.48	3.53	0.49

Table 4

Notes: This table presents the descriptive statistics of the variables used in data analysis for the sample of 30 banks during 1998-2010. *ln(total assets)* is the natural logarithm of the value of bank's assets in millions of US dollars, *ROA* is the ratio of bank's net income to total assets (in %), *leverage* is the ratio of bank's total liabilities to total assets (in %), all retrieved from Compustat Global or North America databases. The variable *CEO bonus/salary* is the ratio of the bank's CEO bonus to salary, $ln(totalCEOcompensation)$ is the natural logarithm of total CEO compensation in thousands of US dollars, *ln(ceo stock)* is the natural logarithm of the value of bank shares held by the CEO calculated by multiplying the number of CEO shares owned (in thousands) by their price at the end of the year and *ln(ceo deferred pay)* is the natural logarithm of (1+the total balance of CEO deferred pay in thousands US dollars), available from the Execucomp database. Detrended GDP is the value of the de-trended GDP index in the country in which a bank is headquartered available from OECD short-term indicators database. The variables used for measuring the intensity of misconduct are natural logarithms of (1+the real value of misconduct starting each year in millions of US dollars). The bank-year level statistics for the number of misconduct cases reported are grouped to avoid over-weighting misconduct that results in actions from multiple parties. All continuous variables are deflated to 2010 values and winsorized at 1% and 99% of their distributions.

	Obs.	mean	median	sd	min	max
Bank balance sheet						
ln(total assets)	390	12.99	13.19	1.19	9.60	14.92
ROA (%)	339	0.93	0.85	0.70	-1.04	2.91
leverage (%)	390	93.18	93.35	3.00	84.33	97.83
CEO compensation						
CEO bonus/salary	193	4.34	1.32	7.96	0.00	48.87
CEO total compensation	207	19493	16022	17776	71	113919
ln(CEO total compensation)	207	9.45	9.68	1.16	4.26	11.64
No. shares owned by CEO	203	11066	1021	44927	42	261358
Value of shares held by CEO	203	114165	48516	154662	7882	500559
ln(Value of shares held by CEO)	203	10.89	10.79	1.23	8.97	13.12
CEO deferred comp. balance	78	8998	5130	13788	0	93059
ln(1+CEO deferred comp. balance)	78	7.16	8.54	3.29	0	11.44
Business Cycle						
Detrended GDP Index	390	100.09	99.98	1.33	96.86	103.56
Misconduct						
ln(1+total conduct costs)	390	2.75	2.36	2.81	0	9.24
ln(1+underwriting costs)	390	1.05	0	2.26	0	8.85
ln(1+abuse costs)	390	1.17	0	2.11	0	7.63
ln(1+individual case costs)	390	0.17	0	0.72	0	4.22
ln(1+compliance costs)	390	0.47	0	0.98	0	4.22
ln(1+market manipulation costs)	390	0.77	0	1.89	0	7.31
ln(1+sanctions costs)	390	0.24	0	0.99	0	6.02
total number of cases	390	1.50	1	1.81	0	10
number of underwriting cases	390	0.27	0	0.66	0	4
number of abuse cases	390	0.42	0	0.78	0	6
number of individual cases	390	0.10	0	0.37	0	3
number of compliance cases	390	0.35	0	0.72	0	5
number of market manipulation cases	390	0.14	0	0.40	0	2
number of sanctions cases	390	0.07	0	0.27	0	2

Table 5 - Total Misconduct Initiation

Notes: This table uses the sample of 30 banks over 1998-2010 in columns 1 and 2 and a sample of 16 banks in columns 3-11. The dependent variable is the natural logarithm of the value of all misconduct cases starting in a given year. $cycle_t$ is de-trended GDP index in the country in which the bank is headquartered. *CEO bonus/salary*$_{t-1}$ is the ratio of CEO bonus to salary in the preceding year, *ln(CEO compensation)*$_{t-1}$ is the natural logarithm of total CEO compensation in the preceding year in thousand US dollars, *avg.CEO bonus/salary* is the average ratio of CEO bonus to total CEO remuneration over the sample period). *ln(ceo stock)*$_{t-1}$ is the natural logarithm of value of bank shares held by CEO calculated by multiplying the number of CEO shares owned ((in thousands) by their price at the end of the year and *ln(ceo deferred pay)*$_{t-1}$ is the logarithm of the total balance of CEO deferred pay (in thousands US dollars) outstanding in the previous year. $leverage_t$ is bank leverage measured as the ratio of total bank liabilities to total bank assets (in %). *ln(assets)* is the natural logarithm of total bank assets in million US dollars and ROA_{t-1} is the ratio of bank's net income to total assets. *reg. investig.*$_{t-1}$ is the number of investigations initiated by regulators against a given bank in the preceding year (grouped so that cases are not over-counted in cases of multiple regulators) that resulted in disciplinary actions against banks during 2000-2016. All variables are deflated to 2010 values and winsorized at 1% and 99% of their distributions. Standard errors clustered at the bank level are reported in parentheses. Statistical significance at the 1%, 5% and 10% level is indicated by ***, **, and *, respectively.

Dep. var - ln(1+total misconduct costs)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ln(assets)$_t$	1.927***	1.604***	1.615***	1.753***	1.478***	1.258	1.560***	1.652***	1.463***	1.471***	-0.044
	(0.498)	(0.318)	(0.235)	(0.320)	(0.231)	(2.071)	(0.228)	(0.316)	(0.208)	(0.240)	(2.213)
ROA$_{t-1}$	-0.224	-0.166	-0.373	-0.342	-0.513*	-0.458	-0.364	-0.274	-0.290	-0.513*	-0.574
	(0.270)	(0.221)	(0.256)	(0.288)	(0.248)	(0.519)	(0.258)	(0.295)	(0.242)	(0.249)	(0.527)
leverage$_t$	0.101	0.161*	0.163*	0.138	0.232**	0.267	0.161*	0.130	0.142*	0.232**	0.350
	(0.085)	(0.080)	(0.078)	(0.084)	(0.102)	(0.275)	(0.078)	(0.088)	(0.074)	(0.103)	(0.278)
no. regulator investig.$_{t-1}$	-0.200	-0.153	-0.078	-0.119	-0.074	-0.082	-0.079	-0.169	-0.069	-0.074	0
	(0.194)	(0.189)	(0.250)	(0.256)	(0.233)	(0.331)	(0.242)	(0.245)	(0.243)	(0.233)	(0.341)
cycle$_t$		0.272***	0.225*	0.248**	0.192*	-0.239	-0.681	0.137	0.055	0.135	0.383
		(0.079)	(0.106)	(0.115)	(0.107)	(0.312)	(1.185)	(0.127)	(0.120)	(0.548)	(0.491)
n(ceo compensation)$_{t-1}$			0.185				-9.134				
			(0.139)				(12.515)				
ceo bonus/salary$_{t-1}$				0.001				-2.323***			
				(0.019)				(0.653)			
ln(ceo stock)$_{t-1}$					0.138					-0.369	
					(0.105)					(4.769)	
ln(ceo deferred pay)$_{t-1}$						0.177**					9.299*
						(0.067)					(4.794)
cycle$_t$ x ln(ceo compensation)$_{t-1}$							0.094				
							(0.127)				
cycle$_t$ x ceo bonus/salary$_{t-1}$								0.023***			
								(0.007)			
cycle$_t$ x avg.CEO bonus/salary									0.043***		
									(0.014)		
cycle$_t$ x ln(ceo stock)$_{t-1}$										0.005	
										(0.048)	
cycle$_t$ x ln(ceo deferred pay)$_{t-1}$											-0.092*
											(0.048)
Year effects	Yes	No	No	No	No	No	No	No	No	No	No
Bank effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	333	333	206	193	200	61	206	193	208	200	61
R^2	0.187	0.137	0.124	0.106	0.122	0.119	0.127	0.120	0.128	0.122	0.159

Table 6 - Misconduct in underwriting activities

Notes: This table uses the sample of 30 banks over 1998-2010 in columns 1 and 2 and a sample of 16 banks in columns 3-11. The dependent variable is the natural logarithm of the value of misconduct cases related to bank underwriting activities starting in a given year. Examples of such events are the underwriting of technology firms during the dot-com boom, helping fraudulent firms such as WorldCom and Enron to raise finance, and issuing securities backed by low-quality mortgages or getting those insured. $cycle_t$ is de-trended GDP index in the country in which the bank is headquartered. *CEO bonus/salary*$_{t-1}$ is the ratio of CEO bonus to salary in the preceding year, *ln(CEO compensation)*$_{t-1}$ is the natural logarithm of total CEO compensation in the preceding year in thousands of US dollars, *avg.CEO bonus/salary* is the average ratio of CEO bonus to total CEO remuneration over the sample period). *ln(ceo stock)*$_{t-1}$ is the natural logarithm of value of bank shares held by CEO calculated by multiplying the number of CEO shares owned ((in thousands) by their price at the end of the year and *ln(ceo deferred pay)*$_{t-1}$ is the logarithm of the total balance of CEO deferred pay (in thousands of US dollars) outstanding in the previous year. $leverage_t$ is bank leverage measured as the ratio of total bank liabilities to total bank assets (in %). *ln(assets)* is the natural logarithm of total bank assets in millions of US dollars and ROA_{t-1} is the ratio of bank's net income to total assets. *reg. investig.*$_{t-1}$ is the number of investigations initiated by regulators against a given bank in the preceding year (grouped so that cases are not over-counted in cases of multiple regulators) that resulted in disciplinary actions against banks during 2000-2016. All variables are deflated to 2010 values and winsorized at 1% and 99% of their distributions. Standard errors clustered at the bank level are reported in parentheses. Statistical significance at the 1%, 5% and 10% level is indicated by ***, **, and *, respectively.

Dep. var - ln(1+ underwriting costs)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ln(assets)$_t$	0.687*	0.326	0.497	0.576	0.382	2.253	0.301	0.406	0.170	0.230	-0.195
	(0.391)	(0.206)	(0.293)	(0.368)	(0.312)	(1.875)	(0.275)	(0.334)	(0.191)	(0.335)	(1.557)
ROA$_{t-1}$	0.206	0.121	-0.106	-0.088	-0.131	0.095	-0.076	0.027	0.026	-0.128	-0.122
	(0.285)	(0.269)	(0.358)	(0.381)	(0.306)	(0.298)	(0.362)	(0.394)	(0.310)	(0.303)	(0.293)
leverage$_t$	0.102	0.136*	0.136	0.117	0.159	-0.214	0.130	0.103	0.059	0.165	-0.059
	(0.082)	(0.078)	(0.093)	(0.101)	(0.110)	(0.128)	(0.090)	(0.102)	(0.073)	(0.106)	(0.149)
no. regulator investig.$_{t-1}$	-0.304	-0.170	-0.172	-0.210	-0.189	-0.122	-0.176	-0.294	-0.110	-0.189	0.032
	(0.251)	(0.241)	(0.341)	(0.286)	(0.330)	(0.147)	(0.297)	(0.271)	(0.289)	(0.323)	(0.210)
cycle$_t$		0.379***	0.493**	0.518**	0.472**	0.298	-2.772**	0.331*	0.040	-0.775	1.469***
		(0.127)	(0.175)	(0.183)	(0.178)	(0.183)	(1.060)	(0.170)	(0.154)	(0.935)	(0.424)
ln(ceo compensation)$_{t-1}$			0.207				-33.364**				
			(0.131)				(11.754)				
ceo bonus/salary$_{t-1}$				0.035				-3.878***			
				(0.025)				(0.898)			
ln(ceo stock)$_{t-1}$					0.161					-10.973	
					(0.167)					(8.769)	
ln(ceo deferred pay)$_{t-1}$						0.018					17.178***
						(0.046)					(4.847)
cycle$_t$ x ln(ceo compensation)$_{t-1}$							0.337**				
							(0.118)				
cycle$_t$ x ceo bonus/salary$_{t-1}$								0.039***			
								(0.009)			
cycle$_t$ x avg.CEO bonus/salary									0.111***		
									(0.016)		
cycle$_t$ x ln(ceo stock)$_{t-1}$										0.112	
										(0.088)	
cycle$_t$ x ln(ceo deferred pay)$_{t-1}$											-0.173***
											(0.049)
Year effects	Yes	No	No	No	No	No	No	No	No	No	No
Bank effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	333	333	206	193	200	61	206	193	208	200	61
R^2	0.236	0.105	0.134	0.142	0.128	0.088	0.171	0.180	0.229	0.142	0.368

Table 7 - Total misconduct and leverage

Notes: This table uses the sample of 30 banks over 1998-2010 in column 1 and a sample of 16 banks in columns 2-6. The dependent variable is the natural logarithm of the total value of misconduct initiated in a given year. $cycle_t$ is de-trended GDP index in the country in which the bank is headquartered. *CEO bonus/salary*$_{t-1}$ is the ratio of CEO bonus to salary in the preceding year, *ln(CEO compensation)*$_{t-1}$ is the natural logarithm of total CEO compensation in the preceding year in thousands of US dollars, *avg.CEO bonus/salary* is the average ratio of CEO bonus to total CEO remuneration over the sample period). *ln(ceo stock)*$_{t-1}$ is the natural logarithm of value of bank shares held by CEO calculated by multiplying the number of CEO shares owned ((in thousands) by their price at the end of the year and *ln(ceo deferred pay)*$_{t-1}$ is the logarithm of the total balance of CEO deferred pay (in thousands of US dollars) outstanding in the previous year. $leverage_t$ is bank leverage measured as the ratio of total bank liabilities to total bank assets (in %). *ln(assets)* is the natural logarithm of total bank assets in millions of US dollars and ROA_{t-1} is the ratio of bank's net income to total assets. *reg. investig.*$_{t-1}$ is the number of investigations initiated by regulators against a given bank in the preceding year (grouped so that cases are not over-counted in cases of multiple regulators) that resulted in disciplinary actions against banks during 2000-2016. All variables are deflated to 2010 values and winsorized at 1% and 99% of their distributions. Standard errors clustered at the bank level are reported in parentheses. Statistical significance at the 1%, 5% and 10% level is indicated by ***, **, and *, respectively.

Dep. var - ln(1+ total misconduct costs)	(1)	(2)	(3)	(4)	(5)	(6)
leverage$_t$	-3.819*	0.003	0.078	0.068	-0.121	0.225
	(2.228)	(0.314)	(0.090)	(0.100)	(0.361)	(0.245)
cycle$_t$	-3.436	0.224*	0.230*	0.209*	0.196*	-0.242
	(2.100)	(0.105)	(0.112)	(0.101)	(0.108)	(0.320)
leverage$_t$ x cycle$_t$	0.040*					
	(0.023)					
leverage$_t$ x ln(ceo compensation)$_{t-1}$		0.016				
		(0.031)				
ln(ceo compensation)$_{t-1}$		-1.295				
		(2.698)				
leverage$_t$ x ceo bonus/salary$_{t-1}$			0.018***			
			(0.006)			
ceo bonus/salary$_{t-1}$			-1.668***			
			(0.554)			
leverage$_t$ x avg.CEO bonus/salary				0.024**		
				(0.010)		
leverage$_t$ x ln(ceo stock)$_{t-1}$					0.033	
					(0.027)	
ln(ceo stock)$_{t-1}$					-2.846	
					(2.518)	
leverage$_t$ x ln(ceo deferred pay)$_{t-1}$						0.007
						(0.028)
ln(ceo deferred pay)$_{t-1}$						-0.442
						(2.563)
ln(assets)$_t$	1.554***	1.603***	1.662***	1.524***	1.509***	1.345
	(0.326)	(0.236)	(0.319)	(0.221)	(0.234)	(2.181)
ROA$_{t-1}$	-0.084	-0.355	-0.229	-0.271	-0.503*	-0.458
	(0.221)	(0.265)	(0.303)	(0.245)	(0.258)	(0.522)
no. regulator investig.$_{t-1}$	-0.128	-0.069	-0.190	-0.095	-0.088	-0.082
	(0.187)	(0.261)	(0.242)	(0.238)	(0.233)	(0.334)
Bank effects	Yes	Yes	Yes	Yes	Yes	Yes
N	333	206	193	208	200	61
R^2	0.143	0.125	0.119	0.120	0.124	0.120

Table 8 - Misconduct related to underwriting and leverage

Notes: This table uses the sample of 30 banks over 1998-2010 in column 1 and a sample of 16 banks in columns 2-6. The dependent variable is the natural logarithm of the value of misconduct cases related to bank underwriting activities initiated in a given year. Examples of such events are the underwriting of technology firms during the dot-com boom, helping fraudulent firms such as WorldCom and Enron to raise finance, and issuing securities backed by low-quality mortgages or getting those insured. $cycle_t$ is de-trended GDP index in the country in which the bank is headquartered. *CEO bonus/salary*$_{t-1}$ is the ratio of CEO bonus to salary in the preceding year, *ln(CEO compensation)*$_{t-1}$ is the natural logarithm of total CEO compensation in the preceding year in thousands of US dollars, *avg.CEO bonus/salary* is the average ratio of CEO bonus to total CEO remuneration over the sample period). *ln(ceo stock)*$_{t-1}$ is the natural logarithm of value of bank shares held by CEO calculated by multiplying the number of CEO shares owned ((in thousands) by their price at the end of the year and *ln(ceo deferred pay)*$_{t-1}$ is the logarithm of the total balance of CEO deferred pay (in thousands of US dollars) outstanding in the previous year. $leverage_t$ is bank leverage measured as the ratio of total bank liabilities to total bank assets (in %). *ln(assets)* is the natural logarithm of total bank assets in millions of US dollars and ROA_{t-1} is the ratio of bank's net income to total assets. *reg. investig.*$_{t-1}$ is the number of investigations initiated by regulators against a given bank in the preceding year (grouped so that cases are not over-counted in cases of multiple regulators) that resulted in disciplinary actions against banks during 2000-2016. All variables are deflated to 2010 values and winsorized at 1% and 99% of their distributions. Standard errors clustered at the bank level are reported in parentheses. Statistical significance at the 1%, 5% and 10% level is indicated by ***, **, and *, respectively.

Dep. var - ln(1+ underwriting costs)	(1)	(2)	(3)	(4)	(5)	(6)
$leverage_t$	-3.680	-0.787***	0.065	-0.106	-0.747	0.083
	(2.640)	(0.217)	(0.098)	(0.085)	(0.508)	(0.222)
$cycle_t$	-3.176	0.489**	0.503**	0.446**	0.481**	0.316*
	(2.433)	(0.170)	(0.179)	(0.163)	(0.171)	(0.180)
$leverage_t$ x $cycle_t$	0.038					
	(0.027)					
$leverage_t$ x ln(ceo compensation)$_{t-1}$		0.095***				
		(0.023)				
ln(ceo compensation)$_{t-1}$		-8.325***				
		(2.069)				
$leverage_t$ x ceo bonus/salary$_{t-1}$			0.015**			
			(0.007)			
ceo bonus/salary$_{t-1}$			-1.416*			
			(0.679)			
$leverage_t$ x avg.CEO bonus/salary				0.057***		
				(0.008)		
$leverage_t$ x ln(ceo stock)$_{t-1}$					0.084*	
					(0.045)	
ln(ceo stock)$_{t-1}$					-7.493*	
					(4.002)	
$leverage_t$ x ln(ceo deferred pay)$_{t-1}$						-0.048
						(0.034)
ln(ceo deferred pay)$_{t-1}$						4.339
						(3.002)
ln(assets)$_t$	0.278	0.429	0.496	0.339	0.460	1.646
	(0.196)	(0.282)	(0.342)	(0.264)	(0.317)	(1.599)
ROA_{t-1}	0.199	-0.004	0.010	0.066	-0.106	0.093
	(0.273)	(0.346)	(0.406)	(0.332)	(0.301)	(0.281)
no. regulator investig.$_{t-1}$	-0.147	-0.118	-0.271	-0.181	-0.224	-0.119
	(0.242)	(0.346)	(0.282)	(0.309)	(0.320)	(0.144)
Bank effects	Yes	Yes	Yes	Yes	Yes	Yes
N	333	206	193	208	200	61
R^2	0.112	0.153	0.151	0.164	0.141	0.132

Table 9 - Customer abuse

Notes: This table uses the sample of 30 banks over 1998-2010 in columns 1 and 2 and a sample of 16 banks in columns 3-11. The dependent variable is the natural logarithm of the value of misconduct cases related to bank disadvantaging its clients systematically starting in a given year. Examples of such cases are overcharging for products, selling unsuitable services or products, predatory lending or foreclosure abuses that are not limited to a single event or a single counter-party. $cycle_t$ is de-trended GDP index in the country in which the bank is headquartered. *CEO bonus/salary*$_{t-1}$ is the ratio of CEO bonus to salary in the preceding year, *ln(CEO compensation)*$_{t-1}$ is the natural logarithm of total CEO compensation in the preceding year in thousands of US dollars, *avg.CEO bonus/salary* is the average ratio of CEO bonus to total CEO remuneration over the sample period). *ln(ceo stock)*$_{t-1}$ is the natural logarithm of value of bank shares held by CEO calculated by multiplying the number of CEO shares owned ((in thousands) by their price at the end of the year and *ln(ceo deferred pay)*$_{t-1}$ is the logarithm of the total balance of CEO deferred pay (in thousands of US dollars) outstanding in the previous year. $leverage_t$ is bank leverage measured as the ratio of total bank liabilities to total bank assets (in %). *ln(assets)* is the natural logarithm of total bank assets in millions of US dollars and ROA_{t-1} is the ratio of bank's net income to total assets. *reg. investig.*$_{t-1}$ is the number of investigations initiated by regulators against a given bank in the preceding year (grouped so that cases are not over-counted in cases of multiple regulators) that resulted in disciplinary actions against banks during 2000-2016. All variables are deflated to 2010 values and winsorized at 1% and 99% of their distributions. Standard errors clustered at the bank level are reported in parentheses. Statistical significance at the 1%, 5% and 10% level is indicated by ***, **, and *, respectively.

Dep. var - ln(1+cost of custom. abuse)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ln(assets)$_t$	0.661	0.927***	1.150***	1.399***	1.208***	-3.098	1.119***	1.349***	1.233***	1.272***	-3.837
	(0.490)	(0.192)	(0.244)	(0.317)	(0.216)	(2.868)	(0.273)	(0.347)	(0.267)	(0.256)	(2.883)
ROA$_{t-1}$	-0.582*	-0.364	-0.606**	-0.624*	-0.467	-1.159*	-0.601*	-0.590*	-0.504*	-0.468	-1.225*
	(0.335)	(0.243)	(0.280)	(0.296)	(0.283)	(0.588)	(0.285)	(0.303)	(0.259)	(0.282)	(0.618)
leverage$_t$	0.100	0.078	0.164	0.140	0.167	1.074**	0.163	0.136	0.188	0.165	1.121**
	(0.086)	(0.085)	(0.103)	(0.113)	(0.130)	(0.427)	(0.104)	(0.116)	(0.114)	(0.131)	(0.432)
no. regulator investig.$_{t-1}$	-0.123	-0.015	-0.045	-0.131	-0.088	0.161	-0.045	-0.156	-0.100	-0.088	0.207
	(0.288)	(0.292)	(0.397)	(0.415)	(0.400)	(0.446)	(0.397)	(0.422)	(0.411)	(0.400)	(0.466)
cycle$_t$		0.107	0.006	0.017	-0.009	-0.351	-0.511	-0.038	0.110	0.525	0.003
		(0.095)	(0.124)	(0.132)	(0.139)	(0.314)	(1.557)	(0.145)	(0.139)	(0.567)	(0.496)
ln(ceo compensation)$_{t-1}$			0.315*				-5.003				
			(0.172)				(16.476)				
ceo bonus/salary$_{t-1}$				0.014				-1.124			
				(0.017)				(1.078)			
ln(ceo stock)$_{t-1}$					0.002					4.769	
					(0.122)					(4.673)	
ln(ceo deferred pay)$_{t-1}$						0.100					5.280
						(0.103)					(4.979)
cycle$_t$ x ln(ceo compensation)$_{t-1}$							0.053				
							(0.166)				
cycle$_t$ x ceo bonus/salary$_{t-1}$								0.011			
								(0.011)			
cycle$_t$ x avg.CEO bonus/salary									-0.025		
									(0.025)		
cycle$_t$ x ln(ceo stock)$_{t-1}$										-0.048	
										(0.047)	
cycle$_t$ x ln(ceo deferred pay)$_{t-1}$											-0.052
											(0.050)
Year effects	Yes	No	No	No	No	No	No	No	No	No	No
Bank effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	333	333	206	193	200	61	206	193	208	200	61
R^2	0.128	0.063	0.091	0.079	0.075	0.147	0.091	0.082	0.078	0.077	0.155

Table 10 - Market manipulation

Notes: This table uses the sample of 30 banks over 1998-2010 in columns 1 and 2 and a sample of 16 banks in columns 3-11. The dependent variable is the natural logarithm of the value of misconduct cases related to a bank attempting to manipulate prices of assets or services starting in a given year. Examples of such cases are manipulation of benchmark interest rates or currency prices as well as collusion in prices of bank services. $cycle_t$ is de-trended GDP index in the country in which the bank is headquartered. *CEO bonus/salary*$_{t-1}$ is the ratio of CEO bonus to salary in the preceding year, *ln(CEO compensation)*$_{t-1}$ is the natural logarithm of total CEO compensation in the preceding year in thousands of US dollars, *avg.CEO bonus/salary* is the average ratio of CEO bonus to total CEO remuneration over the sample period). *ln(ceo stock)*$_{t-1}$ is the natural logarithm of value of bank shares held by CEO calculated by multiplying the number of CEO shares owned ((in thousands) by their price at the end of the year and *ln(ceo deferred pay)*$_{t-1}$ is the logarithm of the total balance of CEO deferred pay (in thousands of US dollars) outstanding in the previous year. $leverage_t$ is bank leverage measured as the ratio of total bank liabilities to total bank assets (in %). *ln(assets)* is the natural logarithm of total bank assets in millions of US dollars and ROA_{t-1} is the ratio of bank's net income to total assets. *reg. investig.*$_{t-1}$ is the number of investigations initiated by regulators against a given bank in the preceding year (grouped so that cases are not over-counted in cases of multiple regulators) that resulted in disciplinary actions against banks during 2000-2016. All variables are deflated to 2010 values and winsorized at 1% and 99% of their distributions. Standard errors clustered at the bank level are in parentheses. Statistical significance at the 1%, 5% and 10% level is indicated by ***, **, and *, respectively.

Dep. var - ln(total cost of market manipulation)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ln(assets)$_t$	0.653	1.004**	0.616	0.930*	0.607	-0.489	0.665	0.821	0.560	0.631	-0.686
	(0.547)	(0.390)	(0.370)	(0.486)	(0.358)	(1.557)	(0.387)	(0.498)	(0.378)	(0.379)	(1.741)
ROA$_{t-1}$	-0.244	-0.210	-0.106	-0.257	-0.174	0.122	-0.113	-0.184	-0.177	-0.175	0.104
	(0.230)	(0.190)	(0.179)	(0.219)	(0.178)	(0.302)	(0.182)	(0.193)	(0.220)	(0.180)	(0.310)
leverage$_t$	0.110	0.123	0.045	0.038	0.042	0.053	0.046	0.029	0.032	0.041	0.066
	(0.089)	(0.077)	(0.066)	(0.077)	(0.063)	(0.187)	(0.069)	(0.069)	(0.068)	(0.064)	(0.199)
no. regulator investig.$_{t-1}$	0.117	0.142	0.163	0.125	0.162	-0.034	0.164	0.072	0.188	0.162	-0.021
	(0.132)	(0.128)	(0.122)	(0.127)	(0.117)	(0.295)	(0.115)	(0.135)	(0.132)	(0.117)	(0.318)
cycle$_t$		0.223***	0.069*	0.093**	0.073*	-0.062	0.878	-0.026	0.032	0.264	0.033
		(0.061)	(0.033)	(0.037)	(0.038)	(0.078)	(0.574)	(0.039)	(0.052)	(0.248)	(0.164)
ln(ceo compensation)$_{t-1}$			-0.162				8.161				
			(0.178)				(5.598)				
ceo bonus/salary$_{t-1}$				-0.004				-2.498***			
				(0.014)				(0.362)			
ln(ceo stock)$_{t-1}$					-0.014					1.690	
					(0.154)					(2.190)	
ln(ceo deferred pay)$_{t-1}$						0.012					1.395
						(0.044)					(2.248)
cycle$_t$ x ln(ceo compensation)$_{t-1}$							-0.084				
							(0.057)				
cycle$_t$ x ceo bonus/salary$_{t-1}$								0.025***			
								(0.004)			
cycle$_t$ x avg.CEO bonus/salary									0.011		
									(0.011)		
cycle$_t$ x ln(ceo stock)$_{t-1}$										-0.017	
										(0.021)	
cycle$_t$ x ln(ceo deferred pay)$_{t-1}$											-0.014
											(0.023)
Year effects	Yes	No	No	No	No	No	No	No	No	No	No
Bank effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	333	333	206	193	200	61	206	193	208	200	61
R^2	0.171	0.123	0.086	0.102	0.068	0.021	0.092	0.140	0.071	0.068	0.024

Appendix 1 - Misconduct Types

Notes: This table provides an overview of the different classes of misconduct used in this paper.

Class	Description	Examples	Sample cases
Underwriting	Cases related to issuing or underwriting securities (own shareholder suits not included).	Mortgage backed securities fraud; underwriting the shares and bonds of fraudulent Enron and Worldcom and helping the firms to conceal their real financial situation; conflict of interest in investment banks related to underwriting and selling technology stock.	December 2016: Deutsche bank fined 7.2b US dollars by the DoJ for packaging and selling subprime mortgage backed securities. December 2002: Major investment banks and regulators signed a settlement agreement and agreed to pay 1.4b US dollars for conflicts of interest between brokerage and research analyst businesses during the dot-com boom. March 2005: Goldman Sachs settled a class action suit for 11m US dollars for helping WorldCom sell billions in bonds in the two years leading up to its bankruptcy.
Disadvantaging	Cases related to banks not acting in the best interest of clients, or abusing them on a systematic basis. Not included: individual cases that resulted from employee initiatives or individual cases involving a single firm, PPI provisions, market timing/proprietary trading cases.	Foreclosures; predatory lending; overcharging for services/products; issuing bad advice; selling too complex securities to inexperienced investors; overstating the liquidity of auction rate securities; abuses in IPO allocation processes.	April 2011: 14 largest U.S. mortgage servicers agreed to pay back homeowners their losses related to loan foreclosures. January 2011: Barclays ordered to pay 67.7m GBP in fines and restitutions by FSA for selling risky assets to investors near retirement age and unsophisticated investors. January 2011: Bank of America settled a 410m US dollar class action for manipulating debit transactions so as to maximise overdraft fees if customer account balance was exceeded. August 2008: Citi bank fined 600m US dollars by regulators for marketing and selling auction rate securities as safe and liquid products when they faced increasing liquidity risk.
Manipulation	Attempts to collude and manipulate prices.	Include cases related to colluding when setting the costs of retail banking services; attempts to manipulate asset prices or benchmark rates.	December 2013: The European Commission imposed fines totaling 1.49b euro on a number of banks for participating in the interest rate derivatives cartels in various currencies. September 2010: The French Competition Authority fined 11 firms including Crdit Agricole, BNP Paribas and Societe Generale 385m euros for colluding on the price for clearing checques electronically.
Compliance	Cases related to failings in compliance in reporting or adhering to regulations. These cases also encompass actions by regulators resulting from banks trading on client money or not training staff to give proper advice.	Reporting failures; failures in brokerage where the trades executed were not the most beneficial to the banks' clients; failing to segregate client money in trading accounts; failing to preserve emails; capital overstatements.	December 2013: FINRA fined Barclays 3.75m US dollars for allegedly failing to keep proper electronic records, emails and instant messages. September 2015: SEC fined Credit Suisse 4.25m US dollars for submitting deficient information about trades by its customers. March 2005: FINRA fined JP Morgan 2m US dollars for offering customers class B and C shares whereas class A shares might have been more suitable. May 2005: Citigroup Inc, Morgan Stanley, UBS AG and Wells Fargo & Co fined and ordered restitution of 9.1m US dollars by FINRA for selling leveraged and inverse exchange-traded funds "without reasonable supervision."

Appendix 1 - Misconduct Types, continued

Notes: This table provides an overview of the different classes of misconduct used in this paper.

Class	Description	Examples	Sample cases
Sanctions/ laundering/ taxes	Dealing with individuals or institutions in countries subject to US sanctions, money laundering, helping bank clients avoid taxation.	Cases related to doing business on behalf on entities from countries subject to US sanctions such as Cuba, Iran and Syria; cases related to helping laundering money; cases related to helping clients avoid taxes.	June 2014: BNP Paribas fined 8.97b US dollars by OFAC and Federal Reserve Board for processing transactions to or through U.S. financial institutions that involved countries, entities, and/or individuals subject to the sanctions programs administered by OFAC. December 2012: HSBC was fined 1.92b US dollars for laundering Mexican drug money by the OCC, Federal Reserve Board and OFAC. June 2015: Societe Generale fined 17.8m US dollars by the DoJ for helping U.S. taxpayers to hide foreign accounts and evade their U.S. tax obligations.
Individual cases	Cases resulting from bad judgement by bank employees, individual cases of disadvantaging a single firm/client.	Cases related to bank employees misappropriating funds from client accounts; rogue trading; cases that involved disadvantaging a single firm or client/breaking a contract.	October 2012: Citi fined 2m US dollars by SEC and Massachusetts Secretary of the Commonwealth for failing to supervise an employee that emailed some research to journalists who later published some of the information in a blog post. February 2014: Barclays paid 141m US dollars to CITI for providing foreign exchange services to a unit of Lehman Brothers Holdings Inc soon after Lehman's bankruptcy, with Barclays promising to repay the losses but Barclays refused to honor it. September 2005: Morgan Stanley fined 6m US dollars for failing to supervise a worker who misappropriated funds from clients for 13 years. June 2006: Deutsche bank and Credit Suisse agreed to pay 316m US dollars each to settle a case in which they were accused by Huntsman corporation for its failed takeover deal.
Other cases	Cases that cannot be assigned to a specific category	Placing robo calls; recording calls; market timing/proprietary trading; involvement in Ponzi schemes.	July 2015: HSBC settled a class action related to recording debt-collection calls without consent of consumers for 5.5m US dollars. March 2004: Bank of America was fined 375m US dollars by the Sec and NY Attorney General for market timing and improper trading. November 2012: BNY Mellon paid 210m US dollars for suggesting investors to invest with Bernard L. Madoff.