Bank Risk-Taking and Misconduct

Ieva Sakalauskaitė*

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Abstract

This paper studies bank misconduct using a hand-collected dataset on malpractice 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, the severity of misconduct is related to bank remuneration schemes, increasing with CEO bonuses in periods of high economic growth and when bank leverage is high. To explain the observed dynamics, the paper builds a theoretical model in which misconduct arises as an agency cost. There, risky projects become profitable during economic upturns, and their implementation requires more aggressive pay structures which in turn create manager incentives to engage in other activities that boost short-term returns.

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1. Introduction

Numerous conduct failures in banks that have been exposed in 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 malpractice 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 clients.

The costs of these activities surpass 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). Regulators are also concerned about the effects that resulting fines and settlements 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." The report by the European Systemic Risk Board (2015) considers bank conduct failures and resulting financial penalties to be a source of systemic risk as they affect multiple markets and involve systemically important institutions.

Although the costs of misconduct in banks can be substantial, the drivers behind it are not well understood. Contrary to a large body of research examining the causes of financial fraud in other industries,[1] factors contributing malpractice incentives in banks have been empirically addressed only to a limited extent. Theoretical literature also provides differing explanations for the recently observed high levels bank misconduct: for example, in Bénabou and Tirole (2016) it arises as a costly side-effect of compensation schemes focused on observable rather than pro-social tasks. On the other hand, Morrison and Thanassoulis (2017) suggest that bank shareholders might find such behaviours profitable, and intentionally use performance pay to encourage managers to take unethical actions.

In this paper, I take a closer look at misconduct in banks and empirically examine which factors are associated with a higher risk of misbehaviours. I provide stylised evidence that misconduct in banks has persisted for the last couple of decades, and has been pro-cyclical – the effects being stronger in banks with a higher reliance on bonuses in their executive remuneration. 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 initiation (i.e. the events themselves) rather than subsequent enforcement actions.

[1] See Cumming et al. (2015) for a survey.

To explain the observed dynamics, the paper also introduces a theoretical framework which models the relationship between bank compensation schemes, regulatory actions, and misconduct over the business cycle. In the model, bank shareholders have to resort to short-term performance pay to encourage managers to implement risky investment projects when they yield higher returns than safe investments. However, high pay-performance sensitivity also increases managers' incentives to engage in misconduct as it boosts bank profitability observed in the short run. If managers' malpractice results in high conduct costs to bank shareholders, they might face a trade-off between encouraging risk-taking and preventing misconduct during booms when these projects are profitable.

To analyse bank misconduct empirically, I use a hand-collected dataset on the initiation dates of malpractice cases which resulted in regulatory actions and private lawsuits against a sample of 30 major global financial institutions in 2000-2016. Because of the time gap between misconduct occurrence and resulting disciplinary actions, the dataset provides approximate information on malpractice that took place throughout 1998-2010. To measure the severity of misconduct initiated in each bank annually, I use the monetary value of conduct costs incurred subsequently in private lawsuits and regulatory actions. Compared to an indicator variable, this measure provides more information on how misconduct varies in large banks that engage in multiple misconduct cases annually, and also allows to account for the different scales of various events.

The first finding using data on the number of misconduct cases occurring in sample banks each year as well as their severity is that bank misconduct has been quite prevalent over the sample period. Second, the number and resulting costs of events related to bank underwriting activities and customer abuse appear to be cyclical, but other classes of misconduct are less so. It can be also observed that the value of bank misconduct has been somewhat increasing over time.

The severity of misconduct initiated each year is also associated with bank remuneration schemes. Although bank executive bonus payments or cash holdings do not affect the risk of misconduct on average, the severity of bank malpractice increases with CEO bonus to salary ratio in periods of high economic growth. The correlation between CEO bonuses and malpractice is also stronger when bank leverage rises, possibly suggesting that a relationship between managers' incentives to engage in misconduct and bank risk-taking exists.

Further analysis shows that these patters are mostly driven by malpractice related to bank underwriting activities, such as the issuance of mortgage-backed securities which are the most pro-cyclical and affected by remuneration schemes. This type of bank misconduct also appears to be significantly related to executive stockholdings, which have a constraining effect in well-capitalised banks but result in more misconduct when

leverage increases. Meanwhile, other categories of bank misconduct are not strongly affected by the aforementioned factors.

In the remainder of the paper, 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 over time. I use a setup where profit-maximising bank shareholders hire a manager to implement an investment project. The manager can choose between 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. Safe projects have lower short-term payoffs, but are safe in the long run.

Beside to implementing projects, bank managers can also engage in misconduct which increases the probability of observing high short-term returns at a cost to the bank's customers. For example, they can issue loans to applicants with low propensity to repay, attempt to manipulate markets, or sell unsuitable services to retail clients. Such misconduct can be initiated when either the risky or safe project is implemented, and is distinct from traditional risk-taking as it does not affect the payoffs of bank assets. However, misconduct runs the risk of being detected by regulators, which results in managers having their employment contracts terminated and conduct costs being imposed on shareholders.

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

The model shows that when risky projects are more profitable, shareholders face a trade-off between encouraging risk-taking and preventing misconduct. Although the manager's compensation has to shift towards short-term performance pay to induce risk-taking, it also creates stronger incentives to engage in malpractice because at times of long-term risks, managers discount the risk of being detected more heavily. On the other hand, when risky projects are unprofitable, shareholders can defer managers' pay, reducing their incentives to engage in misconduct. This mechanism might result in the pro-cyclicality of bank misconduct observed in the data, as well as its link to executive bonuses.

The model also illustrates how misconduct depends on the probability of detection and the costs that regulators can impose on bank shareholders. When detection risk is too low to discourage malpractice by managers, increasing conduct costs incurred

by shareholders might lead them to move away from risky project implementation as safe projects help avoid misconduct and the resulting financial penalties. Meanwhile, if supervisors increase detection probability, it reduces managers' misconduct incentives for given remuneration schemes, and might eliminate misconduct without affecting bank project choice.

Model extensions examine the implications of bank leverage and consider a situation where regulators are constrained in the penalties they can impose on bank shareholders. It is shown that when conduct costs are limited by bank returns, misconduct might become profitable to bank shareholders even at risk and detection levels at which it was costly and could have been prevented in the baseline model. In this case, misconduct and risky project implementation become 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 might also result in more misbehaviour as leverage increases the attractiveness of risky projects and weakens the disciplinary effects of fines on shareholders.

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 associated during economic booms, possibly implying that the introduction of restrictions on pay structures through bonus caps and requirements for deferred pay might reduce the risk of conduct failures. However, the theoretical framework introduced in this paper shows that the trade-offs involved in these policies depend on whether malpractice is profitable to bank shareholders. If remuneration schemes are used to achieve shareholder objectives other than initiation of misconduct, regulating how banks compensate their executives might result in less profitable projects being implemented. In this case, raising detection risk through better supervision or internal controls might be more efficient than imposing restrictions on bank compensation schemes or increasing fines to shareholders. On the other hand, the latter can prevent misconduct without the associated losses in project value when misconduct is profitable to bank shareholders and they use bonuses 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.

First, an increasing theoretical literature is interested in how high-powered remuneration structures contribute to the deterioration in firm ethics and culture, leading to worse behaviours. For instance, Morrison and Thanassoulis (2017) ague that sharehold-

ers might have incentives to create poor ethical standards in banks through reliance on bonus payments if they find misconduct profitable. Bénabou and Tirole (2016) suggest that the surge in bank misconduct is a result of the decline in firm ethics caused by competition for talent which leads to remuneration focused on easily measurable tasks. This results in managers substituting away from pro-social behaviour, which reduces firm performance and welfare in the long run.

This paper considers the monetary incentives for misconduct generated by bankers' compensation schemes, therefore departing from the questions related to ethics and culture in banks: here, if the increase in her performance pay outweighs the expected costs of being detected, the manager may choose to engage in misconduct. As conduct costs imposed on shareholders exceed the short-term gains from managers' malpractice, misconduct is a form of an agency cost. The reason why it is not prevented through lower reliance on performance pay is that bonuses are necessary to achieve other objectives – incentivize risk-taking.

The view that malpractice is costly to bank shareholders brings this paper close to the literature on moral hazard in firms and the trade-offs faced by firm owners in designing compensation schemes. The side-effects of performance-sensitive pay have been examined in various settings and argued to create manager incentives to issue unsuitable loans, manipulate reported earnings, or choose value-destroying investment projects (see, for instance, Inderst and Ottavianni, 2006, or DeMarzo et al., 2014). In the context of financial institutions, Bannier et al. (2012) suggest that pressure to screen skilled managers might lead to reliance on performance pay, which results in excessive risk-taking. Thanassoulis (2013) illustrates how costly myopic investment results from increasing competition for skilled employees which makes pay deferral excessively expensive. The distinction between these views and the model presented in this paper is that here, agency problems result in misconduct rather than excessive risk-taking, and shareholders face a trade-off between encouraging risky project implementation and preventing malpractice.

The analysis of a new dataset of misconduct in this paper also extends empirical literature on the causes of (financial) misconduct based on evidence from financial and other industries. To my knowledge, the only paper that studies the drivers behind malpractice in financial firms is Nguyen et al. (2016) who focus on how board quality affects the risk of enforcement actions against US banks, and find that better monitoring deters misconduct and increases detection risk. The current paper departs from this study as it focuses on how the effects of remuneration structures vary with bank risk and investment opportunities, and measures the severity of misconduct initiated annually rather than the risk of banks facing enforcement actions from regulators. Contrary to Nguyen et al. (2016), I do not find that higher bonuses are associated with more

misconduct on average. However, the results suggest that the incentives generated by myopic or highly sensitive remuneration schemes might vary with economic conditions or firm risk, consistent with recent evidence on how the effects of pay structures change over time, as well as the mixed results in studies on securities fraud that do not account for such dynamics (Savaser and Sisli Ciamarra (2016) show that the association between executive pay-performance sensitivity and firm risk varies over the business cycle and is stronger during booms).

The changes in association between bank remuneration schemes and conduct outcomes over time might also help explain why some studies looking at the relationship between securities fraud and executive bonuses, pay-performance sensitivity, or stockholdings in non-financial firms provide mixed evidence on the role of these variables: for example, Gao and Shrieves (2002) find that bonuses increase the risk of financial manipulations, but Burns and Kedia (2006) and Peng and Röell (2008) do not confirm these findings; Alexander and Cohen demonstrate that higher executive stockholdings reduce the risk of corporate fraud, which is not supported by evidence in Johnson et al., 2009, or O'Connor et al., 2006).

The findings in this paper also contribute to the broader academic and regulatory debate on the effects of compensation schemes in financial firms (for example, DeYoung et al., 2013, Bhagat and Bolton, 2014), and pay regulation in financial institutions (for example, Tanaka and Thanassoulis, 2017). In particular, it corroborates evidence that remuneration structures can induce myopic behaviours as demonstrated by Livne et al (2013) who find that higher bank CEO bonuses are associated with more investments in riskier short-term assets. The evidence that executive wealth invested in bank shares increases the pro-cyclicality of asset quality misrepresentations is also interesting in the light of evidence that banks with better aligned executive and shareholder interests suffered higher losses during the financial crisis (Fahlenbrach and Stulz, 2011). The paper's theoretical results are 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 Höffman et al. (2016), where requirements for deferred compensation can reduce the riskiness of bank investment through making the implementation of such projects more costly.

3. Empirical Evidence

I start this section by first introducing the dataset on conduct failures in the sample of 30 major financial institutions, and the key caveats associated with using it. I then move to empirically examine whether and how the severity of conduct failures occurring in the sample banks annually are associated with changes in economic conditions and executive incentives.

3.1. Data

Sources and Sample

To study the dynamics of bank misconduct over time and across banks, I construct a dataset on malpractice which resulted in conduct costs in enforcement 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.[2] 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.

In this paper, I focus on the years in which misconduct is initiated rather than the timing of disciplinary events. This approach allows to assess the conditions under which banks have a higher propensity to engage in malpractice (instead of the conditions under which banks are more likely to pay fines). 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 the 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.[3]

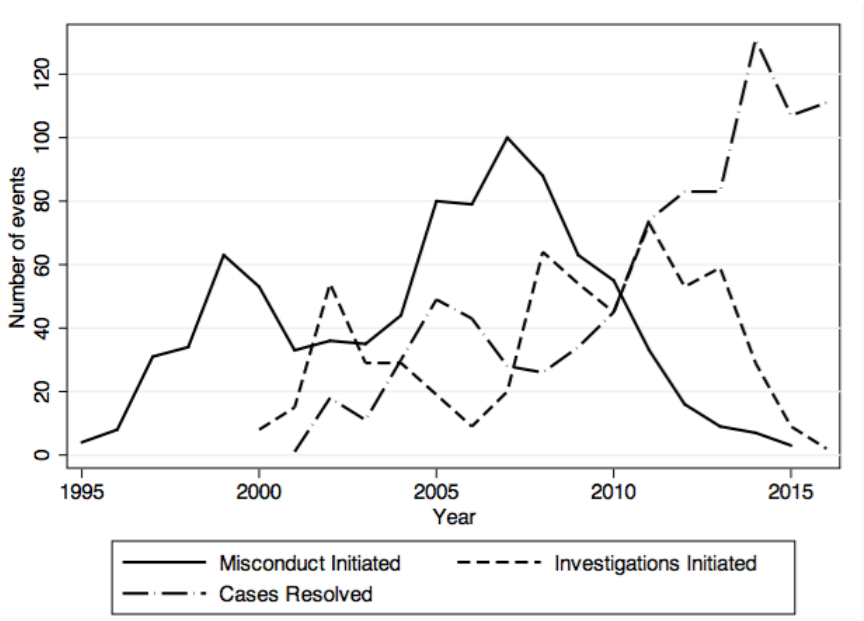
[2]The 30 banks in the sample are JPMorgan Chase, Bank of America, Citigroup, Wells Fargo, Goldman Sachs, Morgan Stanley, U.S. Bancorp, Bank of New York Mellon, PNC Financial Services, Capital One, State Street Corporation, TD Bank, N.A., BB&T, SunTrust Bank, American Express Company, Fifth Third Bank,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

[3]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 malpractice related to mortgage backed securities that was 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.

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 timing of misconduct is clear, for cases that run for longer periods of time, the initiation 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 can be expected to result in reported initiation dates being somewhat delayed.

Figure 1 plots the 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. As expected, booms in misconduct initiation are followed by booms by investigations launched by regulators or private lawsuit filings, and finally increased numbers of enforcement actions or private settlements. The two peaks of misconduct during the dot-com boom in late 1990s and the mortgage boom in mid-2000s were followed by enforcement actions around six years later.

Figure 1: Bank Misconduct Initiations, Investigations and Fines

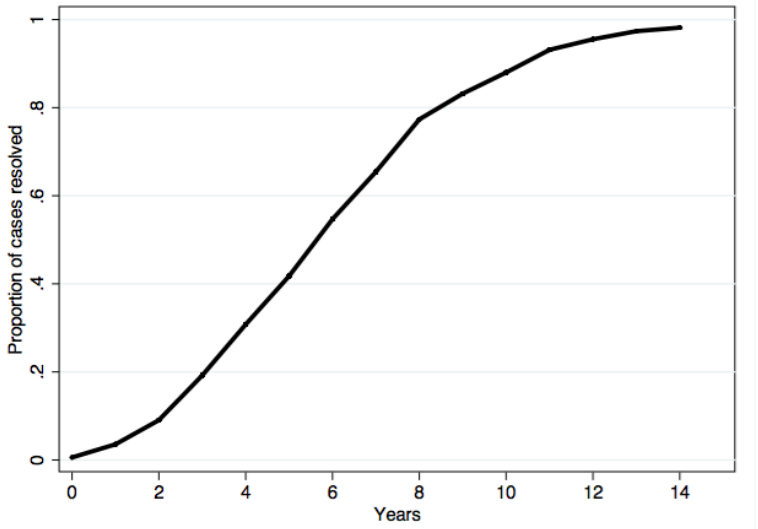


Notes: This figure plots the total number of misconduct cases and their investigations starting each year as well as the total number of fines imposed. The events are not grouped so that cases resulting in multiple actions receive more weight.

I further classify misconduct into broad categories, as various types of conduct failures could result from different 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.[4]

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



Notes: This table presents the cumulative distribution of the time it took misconduct initiated in the sample banks to result in enforcement actions.

Because of the time it takes for misconduct to result in disciplinary actions, the period of 2000-2016 for which data on conduct costs was collected is informative of malpractice that had occurred earlier. From Figure 2 which presents the cumulative distribution of the time lags between the 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. Therefore, in what follows, I focus on misconduct initiated during 1998-2010. Figure 2 suggests that of misconduct cases initiated before 1998, 10% would have been resolved and not included in the data based on conduct costs post-1999, while around 50% 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.

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

Using Data on Detected Misconduct

There are several important caveats to this dataset which arise as a result of using conduct costs or the number of enforcement actions as a measure of misconduct. First, this data is only representative of detected malpractice which is determined both by bank misbehaviour and the scrutiny of regulators or bank customers (i.e. we observe misconduct that was both implemented and detected, and do not observe malpractice that was never uncovered). As noted by Wang (2011), using such data might lead to misleading inferences when certain factors affect both firm and regulator behaviours – for example, she shows that a higher risk of securities fraud being uncovered in firms participating in mergers and acquisitions might result from more scrutiny rather higher incentives for misbehaviour.

In the setting of bank misconduct, regressing conduct costs on executive remuneration might lead to wrong conclusions if higher-paid CEOs are less likely to encourage misbehaviours, but face stricter supervisors. More importantly, if the risk of regulatory actions or lawsuits varies over time, it might result in cyclical patters in misconduct being observed while actual misbehaviours in banks remain constant. Although Wang (2011) proposes a method to disentangle the effects of various factors on crime and detection using a bivariate probit model, employing this approach in the current paper is made more complex because of the continuous measure of misconduct being used here, and the longer time period between misconduct and its detection as compared to studies that model them as occurring simultaneously. In particular, while securities fraud takes on average two years to be detected (Wang, 2011), from Figure 2 only a minority of cases get resolved that quickly in financial institutions and to model regulators' behaviours, a considerably different time period would have to be considered.

Beside to potentially affecting the share of conduct failures being discovered, variation or differences in the risk of detection also alter expected costs of misconduct to banks. For example, evidence presented in Comerton-Forde and Putnins (2013), Kedia and Rajgopal (2011) or Cumming et al. (2017) suggests that better-funded, more geographically proximate, or stricter supervisors reduce the incidence of fraud. In regression analysis, I attempt to account for changes in detection risk by controlling for the number of regulator investigations starting each year for each sample bank. Adding a measure capturing changes in economic conditions can also be expected to partially control for the strength of monitoring if regulators' sentiment varies over the business cycle.

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 lawsuits comes mostly from bank annual

reports and newspaper articles, and therefore depends on bank reporting choices and media coverage. Using a sample of major banks, controlling for fixed bank effects, and focusing on US banks in some specifications help alleviate these concerns, however it might still result in total misconduct not being fully represented in this analysis.

Descriptive Statistics

The severity of bank misconduct can be measured in two ways – 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 severity of bank actions than the number of cases.[5] and provides more within-bank variation than an indicator variable as large institutions tend to engage in multiple misconduct cases annually. 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 numerous 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.[6]

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). First, it appears that misconduct has been prevalent during the last couple of decades. It can also be seen that the number of cases relating to 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. This pattern is also consistent with evidence in Dyck et al. (2014) who provide evidence that securities fraud increased during the dot-com boom. While the number of compliance failures and abuse of bank clients also vary over time, the incidence of cases related to breaching sanctions or market manipulation is less cyclical.

[5] 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.

[6] 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.

Table 1: Numbers of misconduct cases initiated in sample banks annually

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 malpractice 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 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.[7] Around 50% of the costs resulted 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. The recent boom has resulted in higher costs to financial institutions than the preceding dot-com bubble, which could have resulted from increased bank size, more severe conduct failures, or stricter enforcement. Meanwhile, the intensity of individual cases and compliance failures as well as sanctions appears to have been stable or increasing in value.

[7]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.

Table 2: Value of misconduct cases initiated in sample banks annually

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 summarises misconduct costs during 1998-2010 for each sample bank. Differences across banks can be observed: while almost all institutions have been engaged in customer abuse or compliance failures, misconduct related to underwriting activities has been concentrated in major investment banks, and fines for money laundering and helping clients avoid taxes have also been imposed only on a subset of banks.

Table 3: Value of misconduct cases initiated in each sample bank

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
AMERICAN EXPRESS CO	**Sum**	**633**	**0**	**54**	**0**	**477**	**2**	**90**
	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
BANCO SANTANDER SA	**Sum**	**113**	**0**	**0**	**0**	**112**	**0**	**1**
	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
BANK OF AMERICA CORP	**Sum**	**43144**	**26426**	**461**	**892**	**14439**	**1**	**31**
	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
BANK OF NEW YORK MELLON CORP	**Sum**	**671**	**0**	**202**	**1**	**57**	**31**	**0**
	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
BARCLAYS PLC	**Sum**	**5119**	**326**	**91**	**4141**	**325**	**221**	**3**
	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
BB&T CORP	**Sum**	**118**	**90**	**1**	**0**	**0**	**19**	**0**
	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
BNP PARIBAS	**Sum**	**10516**	**0**	**2**	**212**	**19**	**0**	**10186**
	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
CAPITAL ONE FINANCIAL CORP	**Sum**	**319**	**0**	**4**	**0**	**234**	**0**	**0**
	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
CITIGROUP INC	**Sum**	**24744**	**16055**	**89**	**3347**	**5121**	**104**	**17**
	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
CREDIT AGRICOLE SA	**Sum**	**1268**	**0**	**15**	**277**	**0**	**0**	**976**
	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
CREDIT SUISSE GROUP	**Sum**	**3799**	**2180**	**20**	**64**	**422**	**651**	**334**
	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
DEUTSCHE BANK AG	**Sum**	**17268**	**10552**	**109**	**3929**	**288**	**320**	**335**
	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
FIFTH THIRD BANCORP	**Sum**	**137**	**101**	**1**	**0**	**35**	**0**	**0**
	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
GOLDMAN SACHS GROUP INC	**Sum**	**8049**	**7153**	**102**	**334**	**378**	**3**	**0**
	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

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
HSBC HLDGS PLC	**Sum**	**2602**	**626**	**11**	**1020**	**806**	**0**	**16**
	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
ING GROEP NV	**Sum**	**25**	**0**	**1**	**0**	**23**	**0**	**0**
	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
JPMORGAN CHASE & CO	**Sum**	**46166**	**29672**	**110**	**3196**	**10341**	**28**	**98**
	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
LLOYDS BANKING GROUP PLC	**Sum**	**677**	**0**	**0**	**407**	**209**	**0**	**0**
	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
MORGAN STANLEY	**Sum**	**6496**	**5210**	**147**	**59**	**971**	**19**	**0**
	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
PNC FINANCIAL SVC GROUP INC	**Sum**	**374**	**8**	**0**	**0**	**366**	**0**	**0**
	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
ROYAL BANK OF SCOTLAND GROUP	**Sum**	**4757**	**1245**	**16**	**3207**	**120**	**0**	**169**
	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
SCHWAB (CHARLES) CORP	**Sum**	**410**	**0**	**2**	**0**	**408**	**0**	**0**
	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
SOCIETE GENERALE GROUP	**Sum**	**826**	**0**	**11**	**726**	**12**	**77**	**0**
	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
STANDARD CHARTERED PLC	**Sum**	**684**	**0**	**0**	**0**	**0**	**0**	**414**
	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
STATE STREET COR	**Sum**	**534**	**0**	**2**	**0**	**517**	**1**	**0**
	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
SUNTRUST BANKS INC	**Sum**	**1772**	**328**	**5**	**0**	**1438**	**0**	**0**
	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
TORONTO DOMINION BANK	**Sum**	**730**	**0**	**15**	**0**	**311**	**1**	**0**
	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
US BANCORP	**Sum**	**703**	**369**	**2**	**0**	**309**	**0**	**0**
	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
UBS GROUP AG	**Sum**	**7488**	**2011**	**143**	**3279**	**1137**	**4**	**860**
	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
WELLS FARGO & CO	**Sum**	**11816**	**2173**	**14**	**0**	**9394**	**13**	**2**
	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

3.2. Empirical Analysis

In this section, regression analysis is used to measure how incentive schemes, economic conditions and balance sheet characteristics are associated with misconduct in banks.

The general model that is estimated takes the following form:

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

$Misconduct_{i,t}$ is the natural logarithm of conduct costs in bank i, year t.[8] In the baseline regression, I use the total cost resulting from all types of conduct failures, which is later on split into different categories to distinguish between cases of asset quality misrepresentations, market manipulations, or customer abuse.

Several variables are chosen to measure the effects of compensation schemes in $Compensation_{i,t-1}$:[9] 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 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) captures the effects of their exposure to bank performance in the longer-run, and the extent to which their incentives are aligned to those of bank shareholders. This data is available from ExecuComp database only for the sample of US banks.

Independent variable $Cycle_{c,t}$ is added to the model to control for changes in incentives to engage in misconduct over the business cycle. The measure used is GDP deviation from trend in bank headquarters country c, retrieved from OECD Short-term Indicators database. $Leverage_{i,t}$ is the ratio of each bank's total liabilities to total assets and controls for changes in bank capital structure and the resulting risk-taking incentives by shareholders.

By including $Controls_{i,t}$, I attempt to alleviate some of the concerns that arise from estimating changes in bank misconduct over the cycle, and its relationship with remuneration schemes. As regulatory scrutiny which reduces expected gains from misconduct can be expected to vary over the cycle, in all regressions I control for the number of regulator-initiated investigations started against all the sample banks in the preceding year (the grouped number of cases is used). I also add the ratio of the bank's net income to total assets in the preceding year ($ROA_{i,\ t-1}$) to account for the effects of bank performance on CEO compensation (as remuneration observed in the preceding

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

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

year is used, as well). As larger banks can be expected to be involved in more cases of misconduct, and their resulting conduct costs to be higher, I also control for total bank assets (using the natural logarithm of their gross assets, $ln(assets)_{i,\,t}$). u_i are fixed bank effects (fixed year effects are not included in the baseline analysis because of their correlation with the business cycle variable).[10] Descriptive statistics of all the variables used in this section are presented in Table 4.

Table 4: Summary statistics

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, 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
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

[10] When fixed year or CEO effects are added to the regression, analysis yields comparable results (available upon request).

I start data analysis by examining the factors that increase the value of all types of malpractice initiated annually (Table 5). Regression estimates confirm the dynamics observed in Table 1, the value of bank misconduct varying together with the business cycle. 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 higher profitability tends 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 riskiness.

In columns (2)-(11), I investigate the relationship between bank conduct failures and compensation schemes. First, from columns (2)-(5), the ratio of CEO bonuses to salaries and the value of stock held by the CEO appear to be positively correlated with the value of misconduct initiated, but the effects are not statistically significant. Columns (6)-(11) examine whether the association between misconduct initiation and executive pay varies with bank investment opportunities and risk. It could be expected that when prices and the profitability of malpractice increase, or prospective long-term losses are discounted more heavily because of higher failure risk, reliance on short-term variable compensation would lead to more misconduct.

I first interact the measures of firm reliance on bonus pay with $cycle_t$: regression estimates confirm that while past period's CEO bonus/salary ratio is on average not significantly linked to the value of malpractice, higher bonuses are related to more misconduct during economic booms, and have an opposite association when economic growth is slower.[11] While the coefficients on executive stockholdings exhibit a similar pattern, these effects are not significant. To examine whether the correlation between CEO remuneration and bank malpractice changes with bank risk, I also interact remuneration variables with bank leverage as a higher ratio of bank liabilities to assets increases failure probability as well as shareholder risk-taking incentives. Regression results in columns (9)-(11) indeed provide some support to the view that higher reliance on myopic incentives might lead to malpractice when long-term risks increase.

[11] Regression estimates suggest that for an average bank, higher executive bonuses were correlated with the value of misconduct initiated positively when the de-trended GDP index exceeded 100.

Table 5: Regression results for all categories of bank misconduct

Notes: This table uses the sample of 30 banks over 1998-2010 in column 1 and a sample of 16 banks in columns 2-11. 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, *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. $leverage_t$ 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)
$cycle_t$	0.272***	0.248**	0.240**	0.192*	0.212*	0.137	0.050	0.135	0.230*	0.234**	0.196*
	(0.079)	(0.115)	(0.112)	(0.107)	(0.119)	(0.127)	(0.125)	(0.548)	(0.112)	(0.108)	(0.108)
CEO bonus/salary$_{t-1}$		0.0002			0.001	-2.323***			-1.668***		
		(0.019)			(0.019)	(0.653)			(0.554)		
avg.CEO bonus/salary			0.019				-4.608***			-0.492	
			(0.032)				(1.561)			(0.891)	
ln(CEO stock)$_{t-1}$				0.138	0.148			-0.369			-2.846
				(0.105)	(0.102)			(4.769)			(2.518)
$cycle_t$ x CEO bonus/salary$_{t-1}$						0.023***					
						(0.007)					
$cycle_t$ x avg.CEO bonus/salary							0.046***				
							(0.015)				
$cycle_t$ x ln(CEO stock)$_{t-1}$								0.005			
								(0.048)			
$leverage_t$ x CEO bonus/salary$_{t-1}$									0.018***		
									(0.006)		
$leverage_t$ x avg.CEO bonus/salary										0.005	
										(0.009)	
$leverage_t$ x ln(CEO stock)$_{t-1}$											0.033
											(0.027)
ln(assets)$_t$	1.604***	1.753***	1.755***	1.478***	1.655***	1.652***	1.740***	1.471***	1.662***	1.768***	1.509***
	(0.318)	(0.320)	(0.146)	(0.231)	(0.331)	(0.316)	(0.147)	(0.240)	(0.319)	(0.151)	(0.234)
ROA$_{t-1}$	-0.166	-0.342	0.001	-0.513*	-0.576*	-0.274	0.010	-0.513*	-0.229	0.006	-0.503*
	(0.221)	(0.288)	(0.228)	(0.248)	(0.302)	(0.295)	(0.235)	(0.249)	(0.303)	(0.228)	(0.258)
$leverage_t$	0.161*	0.138	0.016	0.232**	0.210*	0.130	0.004	0.232**	0.078	0	-0.121
	(0.080)	(0.084)	(0.050)	(0.102)	(0.115)	(0.088)	(0.046)	(0.103)	(0.090)	(0.052)	(0.361)
no. regulator investig.$_{t-1}$	-0.153	-0.119	-0.083	-0.074	-0.101	-0.169	-0.055	-0.074	-0.190	-0.083	-0.088
	(0.189)	(0.256)	(0.221)	(0.233)	(0.246)	(0.245)	(0.225)	(0.233)	(0.242)	(0.219)	(0.233)
Bank effects	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes
N	333	193	208	200	187	193	208	200	193	208	200
R^2	0.137	0.106	0.525	0.122	0.110	0.120	0.534	0.122	0.119	0.526	0.124

In Tables 6-8, I look at how these relationships vary across different types of bank misconduct, as the incentives generated by compensation schemes and investment opportunities might be different for distinct classes of bank conduct failures.

In Table 6, I estimate the model for a major type of misconduct, namely cases related to bank underwriting activities. There, similar to Table 5, strong procyclicality can be observed. When analysing the effects of remuneration schemes over the sample period, only average executive bonus to salary ratio is significantly related to the value of malpractice initiated. However, similar to the results in Table 5, a higher ratio of bonus to salary realised in the preceding period also increase malpractice at the peak of the business cycle.[12]

From regression results presented in columns (9)-(11), it appears that both higher CEO bonuses and the wealth they hold in bank stock are positively correlated with misconduct risk when bank leverage increases.[13] The findings in column (11) imply that for unlevered banks, better alignment between managers' and owners' interests leads to a reduction of malpractice. This can be interpreted as evidence of misconduct being a form of agency cost, as shareholders of less risky institutions might find misconduct less attractive because of the higher expected costs or reputation value (it can also be argued that highly levered banks might have incentives to engage in malpractice as a form of gambling for resurrection).

[12] The findings in Table 6 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.

[13] Similar to column (6), the relationship between bank executive bonuses and malpractice is positive when the ratio of bank's liabilities to assets exceeds 91%

Table 6: Regression results for misconduct in underwriting activities

Notes: This table uses the sample of 30 banks over 1998-2010 in column 1 and a sample of 16 banks in columns 2-11. 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, *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. $leverage_t$ 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)
$cycle_t$	0.379***	0.518**	0.536***	0.472**	0.498**	0.331*	0.107	-0.775	0.503**	0.501***	0.481**
	(0.127)	(0.183)	(0.170)	(0.178)	(0.185)	(0.170)	(0.138)	(0.935)	(0.179)	(0.161)	(0.171)
CEO bonus/salary$_{t-1}$		0.035			0.032	-3.878***			-1.416*		
		(0.025)			(0.025)	(0.898)			(0.679)		
avg.CEO bonus/salary			0.063*				-10.394***			-3.190***	
			(0.033)				(1.475)			(1.021)	
ln(CEO stock)$_{t-1}$				0.161	0.165			-10.973			-7.493*
				(0.167)	(0.189)			(8.769)			(4.002)
$cycle_t$ x CEO bonus/salary$_{t-1}$						0.039***					
						(0.009)					
$cycle_t$ x avg.CEO bonus/salary							0.105***				
							(0.015)				
$cycle_t$ x ln(CEO stock)$_{t-1}$								0.112			
								(0.088)			
$leverage_t$ x CEO bonus/salary$_{t-1}$									0.015**		
									(0.007)		
$leverage_t$ x avg.CEO bonus/salary										0.035***	
										(0.011)	
$leverage_t$ x ln(CEO stock)$_{t-1}$											0.084*
											(0.045)
ln(assets)$_t$	0.326	0.576	0.997***	0.382	0.511	0.406	0.962***	0.230	0.496	1.075***	0.460
	(0.206)	(0.368)	(0.175)	(0.312)	(0.388)	(0.334)	(0.170)	(0.335)	(0.342)	(0.190)	(0.317)
ROA$_{t-1}$	0.121	-0.088	0.040	-0.131	-0.197	0.027	0.062	-0.128	0.010	0.073	-0.106
	(0.269)	(0.381)	(0.274)	(0.306)	(0.362)	(0.394)	(0.262)	(0.303)	(0.406)	(0.260)	(0.301)
$leverage_t$	0.136*	0.117	0.104	0.159	0.140	0.103	0.078	0.165	0.065	0.007	-0.747
	(0.078)	(0.101)	(0.060)	(0.110)	(0.111)	(0.102)	(0.054)	(0.106)	(0.098)	(0.054)	(0.508)
no. regulator investig.$_{t-1}$	-0.170	-0.210	-0.228	-0.189	-0.210	-0.294	-0.165	-0.189	-0.271	-0.228	-0.224
	(0.241)	(0.286)	(0.311)	(0.330)	(0.287)	(0.271)	(0.276)	(0.323)	(0.282)	(0.281)	(0.320)
Bank effects	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes
N	333	193	208	200	187	193	208	200	193	208	200
R^2	0.105	0.142	0.382	0.128	0.145	0.180	0.443	0.142	0.151	0.402	0.141

In Tables 7 and 8, other major classes of bank conduct failures related to disadvantaging clients and market manipulation are analysed.[14] Customer abuse is not strongly related to the variables considered, although the compensation scheme variables maintain their signs. The results suggest that bank returns might be an important determinant of such actions, the risk of misconduct increasing when profitability is low. This could be explained by such activities becoming relatively more attractive when asset prices are low, or bank employees having stronger incentives to boost their pay in economic downturns. When I turn to analyse the drivers behind attempted market manipulation, it appears to be procyclical, but not systematically related to compensation schemes of the top management, either.

To conclude, the results presented in this section somewhat support the view that bank conduct failures are associated with compensation schemes, but this does not hold for all types of misconduct. Although the effects of executive bonuses or shareholdings are in general not statistically significant on average, it appears that the direction of their effects vary with the business cycle and bank risk. At the same time, 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 malpractice might also reduce the precision with which the effects are estimated, especially when such cases last for extended time periods.

[14] As expected, the results on compliance failures or money laundering and tax evasion do not appear to be systematically related to the variables chosen and are available upon request.

Table 7: Regression results for misconduct related to retail customer abuse

Notes: This table uses the sample of 30 banks over 1998-2010 in column 1 and a sample of 16 banks in columns 2-11. 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,*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. $leverage_t$ 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)
$cycle_t$	0.107	0.017	-0.010	-0.009	-0.001	-0.038	0.063	0.525	0.005	-0.002	-0.006
	(0.095)	(0.132)	(0.126)	(0.139)	(0.148)	(0.145)	(0.141)	(0.567)	(0.132)	(0.129)	(0.141)
CEO bonus/salary$_{t-1}$		0.014			0.016	-1.124			-1.021		
		(0.017)			(0.016)	(1.078)			(1.050)		
avg.CEO bonus/salary			-0.097**				1.681			0.592	
			(0.038)				(2.422)			(0.916)	
ln(CEO stock)$_{t-1}$				0.002	0.017			4.769			-2.674
				(0.122)	(0.126)			(4.673)			(3.556)
$cycle_t$ x CEO bonus/salary$_{t-1}$						0.011					
						(0.011)					
$cycle_t$ x avg.CEO bonus/salary							-0.018				
							(0.024)				
$cycle_t$ x ln(CEO stock)$_{t-1}$								-0.048			
								(0.047)			
$leverage_t$ x CEO bonus/salary$_{t-1}$									0.011		
									(0.011)		
$leverage_t$ x avg.CEO bonus/salary										-0.007	
										(0.010)	
$leverage_t$ x ln(CEO stock)$_{t-1}$											0.029
											(0.039)
ln(assets)$_t$	0.927***	1.399***	1.025***	1.208***	1.489***	1.349***	1.031***	1.272***	1.342***	1.008***	1.235***
	(0.192)	(0.317)	(0.214)	(0.216)	(0.321)	(0.347)	(0.217)	(0.256)	(0.325)	(0.207)	(0.204)
ROA_{t-1}	-0.364	-0.624*	-0.213	-0.467	-0.611	-0.590*	-0.216	-0.468	-0.554*	-0.220	-0.459
	(0.243)	(0.296)	(0.218)	(0.283)	(0.367)	(0.303)	(0.218)	(0.282)	(0.276)	(0.219)	(0.289)
$leverage_t$	0.078	0.140	0.030	0.167	0.134	0.136	0.035	0.165	0.103	0.051	-0.149
	(0.085)	(0.113)	(0.049)	(0.130)	(0.144)	(0.116)	(0.049)	(0.131)	(0.119)	(0.052)	(0.416)
no. regulator investig.$_{t-1}$	-0.015	-0.131	-0.060	-0.088	-0.140	-0.156	-0.070	-0.088	-0.175	-0.060	-0.101
	(0.292)	(0.415)	(0.368)	(0.400)	(0.413)	(0.422)	(0.375)	(0.400)	(0.441)	(0.370)	(0.400)
Bank effects	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes
N	333	193	208	200	187	193	208	200	193	208	200
R^2	0.063	0.079	0.202	0.075	0.085	0.082	0.204	0.077	0.083	0.203	0.076

Table 8: Regression results for misconduct related to market manipulations

Notes: This table uses the sample of 30 banks over 1998-2010 in column 1 and a sample of 16 banks in columns 2-11. 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, *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. $leverage_t$ 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)
$cycle_t$	0.223***	0.093**	0.095**	0.073*	0.099**	-0.026	0.042	0.264	0.078**	0.099**	0.075**
	(0.061)	(0.037)	(0.043)	(0.038)	(0.042)	(0.039)	(0.043)	(0.248)	(0.036)	(0.046)	(0.035)
CEO bonus/salary$_{t-1}$		-0.004			-0.006	-2.498***			-1.402		
		(0.014)			(0.014)	(0.362)			(0.811)		
avg.CEO bonus/salary			0.035*				-1.248			0.477	
			(0.020)				(0.931)			(0.925)	
ln(CEO stock)$_{t-1}$				-0.014	0.016			1.690			-1.766
				(0.154)	(0.145)			(2.190)			(2.811)
$cycle_t$ x CEO bonus/salary$_{t-1}$						0.025***					
						(0.004)					
$cycle_t$ x avg.CEO bonus/salary							0.013				
							(0.009)				
$cycle_t$ x ln(CEO stock)$_{t-1}$								-0.017			
								(0.021)			
$leverage_t$ x CEO bonus/salary$_{t-1}$									0.015		
									(0.009)		
$leverage_t$ x avg.CEO bonus/salary										-0.005	
										(0.010)	
$leverage_t$ x ln(CEO stock)$_{t-1}$											0.019
											(0.032)
ln(assets)$_t$	1.004**	0.930*	0.590***	0.607	0.914*	0.821	0.586***	0.631	0.853	0.580***	0.625*
	(0.390)	(0.486)	(0.180)	(0.358)	(0.474)	(0.498)	(0.182)	(0.379)	(0.502)	(0.168)	(0.349)
ROA$_{t-1}$	-0.210	-0.257	-0.176	-0.174	-0.282	-0.184	-0.173	-0.175	-0.163	-0.180	-0.169
	(0.190)	(0.219)	(0.176)	(0.178)	(0.194)	(0.193)	(0.178)	(0.180)	(0.165)	(0.178)	(0.184)
$leverage_t$	0.123	0.038	-0.031	0.042	0.041	0.029	-0.034	0.041	-0.012	-0.018	-0.165
	(0.077)	(0.077)	(0.037)	(0.063)	(0.078)	(0.069)	(0.039)	(0.064)	(0.071)	(0.031)	(0.362)
no. regulator investig.$_{t-1}$	0.142	0.125	0.105	0.162	0.112	0.072	0.113	0.162	0.066	0.105	0.154
	(0.128)	(0.127)	(0.155)	(0.117)	(0.120)	(0.135)	(0.160)	(0.117)	(0.133)	(0.151)	(0.113)
Bank effects	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes
N	333	193	208	200	187	193	208	200	193	208	200
R^2	0.123	0.102	0.283	0.068	0.098	0.140	0.285	0.068	0.123	0.284	0.069

4. The model

In this section, I suggest a mechanism which can explain the observed positive association between bank executive remuneration and misconduct at times when banks have profitable investment opportunities and are highly leveraged. I also show that this relationship might arise both when misconduct is costly to shareholders and when they find it profitable, and derive implications for remuneration regulation as well as approaches to bank supervision.

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 project to implement and whether to engage in misconduct. At t=1, short-term project returns are realised. At t=2, the long-term risk of investment projects is revealed, and misconduct results in disciplinary action by the regulator if detected.

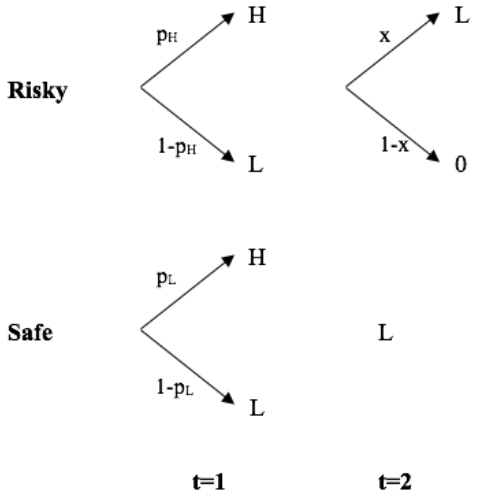
Bank Shareholders and Projects

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

Safe and risky project returns differ in two aspects: their distribution over time and riskiness. Both 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.

Figure 3: Project payoffs



In this setting, the risky project has a higher net present value 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 foregone returns L if long-term risk is realized.

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

To carry out investment projects, bank shareholders have to hire a manager who chooses and implements the project. The project chosen by the manager is not observable to shareholders, but its payoffs are. The bank can commit to a remuneration scheme that is dependent on observed returns, but cannot promise any payment to the manager when bank returns are zero. Shareholder objective is to maximise bank profits which depend on project returns at t=1 and t=2, the manager's compensation expenses, and conduct costs which are 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 shareholders that specify their remuneration (which can depend on bank returns) 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

Beside 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 justifies regulatory actions as it is socially costly: the cost of misconduct to bank customers is $\eta\Delta(H - L)$ where η>1, and so misconduct is not just redistribution of income from bank customers to shareholders.[15]

If managers decide to engage in misconduct, regulators detect it at t=2 with probability 0<λ<1. If detected, managers who engage in misconduct lose their job and remuneration at t=2. This form of sanction mimics the observed practice where misbehaving employees are barred by regulators or fired by the banks themselves.[16] I assume that in this case, the manager's compensation at t=2 is appropriated by the regulator rather than retained by bank shareholders.[17] The assumption of misconduct costs being borne only at t=2 rather than immediately at t=1 is motivated by the time gap 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 managerial misconduct is detected at t=2, it also results in regulatory fines and/or

[15] This assumption could be motivated by the costs of legal proceedings, bank customer risk aversion, or the effects that such cases have on confidence in the financial sector.

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

[17] 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.

restitution C paid by bank shareholders. This assumption 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 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 value 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 at t=2:

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

As described in Section 2, theoretical literature on misconduct considers it both as being encouraged by shareholders and arising as an agency cost. While it can be argued that bank shareholders find malpractice profitable, at least some cases of misconduct in banks uncovered recently appear to have resulted from managers' incentives to boost their short-term income and not necessarily shareholder value. For example, the attempt by UBS employees to manipulate currency exchanges in 2015 breached a previously agreed non-prosecution agreement between UBS and regulators, and resulted in a significant fine.[18] Similarly, Barclays trader Daniel James Plunkett attempted to fix gold prices the day after his bank had been fined for rigging Libor rates, resulting in a 44 million US dollars fine to the bank's shareholders which possibly outweighed the potential gains.[19]

In the model bank shareholders can only prevent misconduct by changing compensation schemes and reducing the incentives of managers to initiate malpractice, and so it abstracts from how changes in internal controls and better governance could help prevent or detect conduct failures. Allowing shareholders to take such costly actions

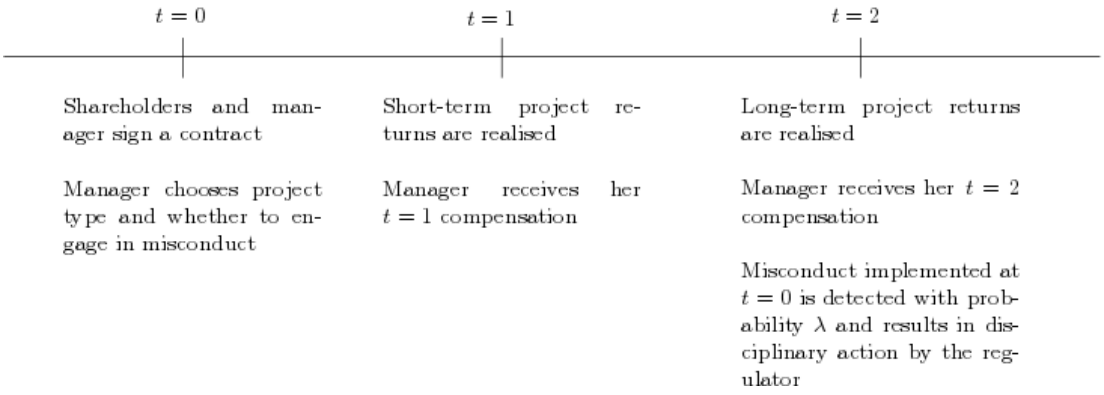
[18] See Financial Times "DoJ hard line on UBS raises concerns on deals with regulators", www.ft.com.
[19] Reuters, "Barclays slapped with 26 million pounds fine over gold price fix".

in this framework would reduce the incidence of misconduct,[20], but the key mechanism of such controls being most necessary during economic booms, and shareholders potentially facing strongest trade-offs in those times, would persist.

Time line

t=0**:** The risk and returns of the risky and safe projects are observed. Bank shareholders offer contracts to managers, setting their remuneration structures at t=1 and t=2. Managers choose between implementing the risky and safe project, and choose whether to engage in misconduct.
t=1**:** The short-term return of the project chosen by the manager is realised. Bank manager receives her 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.

Figure 4: The timeline



4.2. Baseline Results

I start by solving the model in which bank managers cannot engage in misconduct. It allows to derive the managers' 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 derive 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.

[20] In line with findings by Nguyen et al. (2016) that board quality matters in detecting and preventing compliance failures in banks.

In cases when managers cannot engage in misconduct, bank shareholders compare the returns of the risky and safe project net of the manager's 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 the manager's 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. 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.[21] 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:

$$p_H\alpha + \delta x\beta \geq w \tag{PC}$$

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

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). As for a given risk of receiving no returns at t=2, lower compensation at $t = 1$ is needed when returns H are observed more often, α is decreasing in $p_H - p_L$. Finally, the effects of increasing risk are also

[21] I rule out the possibility that bank shareholders induce 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.

stronger when the manager's reservation wage w is high.[22]

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):

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

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 in 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 high return H at t=1 by Δ 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

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

[22]Since higher wages could be a result of competition for talent, this result is in line with Thanassoulis (2013) who argues for a different mechanism where competition-driven increases in participation wages make deferral excessively costly, resulting in a higher share of remuneration awarded in the short run, and more myopic risk-taking.

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 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 long-term risk is not realised, very high project risk 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 the manager's compensation scheme and setting α 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, which leads to the main trade-off faced by bank shareholders when misconduct is costly. First, suppose the safe project has higher expected returns, or $x < \underline{x}$. In this case, the manager's ICC does not have to be fulfilled 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

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

Condition (8) shows that encouraging risk-taking and preventing misconduct is only 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 (left-hand side), while misconduct becomes more attractive as expected costs from its detection diminish (right-hand side). 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 and encourage them to implement the risky project. However, higher bank risk makes bank managers more willing to misbehave as their expected future disciplinary costs diminish, requiring lower performance pay to prevent misconduct.

These results imply that even if the manager can engage in malpractice when both the risky and the safe project are implemented, we might observe more misconduct at times when banks take more risk. When safe projects yield higher returns, manager incentive schemes can be shifted from short-term compensation to deferred pay more easily, preventing malpractice. At times when banks take up more risks, misconduct is harder to prevent as both higher performance-pay sensitivity necessary to encourage risk-taking, and lower expected costs from misconduct because of higher long-term risk, make it more attractive to managers. Also, consistent with Becker's (1968) framework of the economics of crime, misconduct increases (or threshold risk level x increases) in the efficiency of misconduct measured by Δ as it makes misbehaviour more attractive for given risk levels, and decreases in detection risk λ as it has an opposite effect on manager preferences.

Regulation, Risk and Project Choice

When bank managers have the opportunity to engage in misconduct, shareholder choice between safe and risky projects depends not only on their respective returns, but can be also 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.

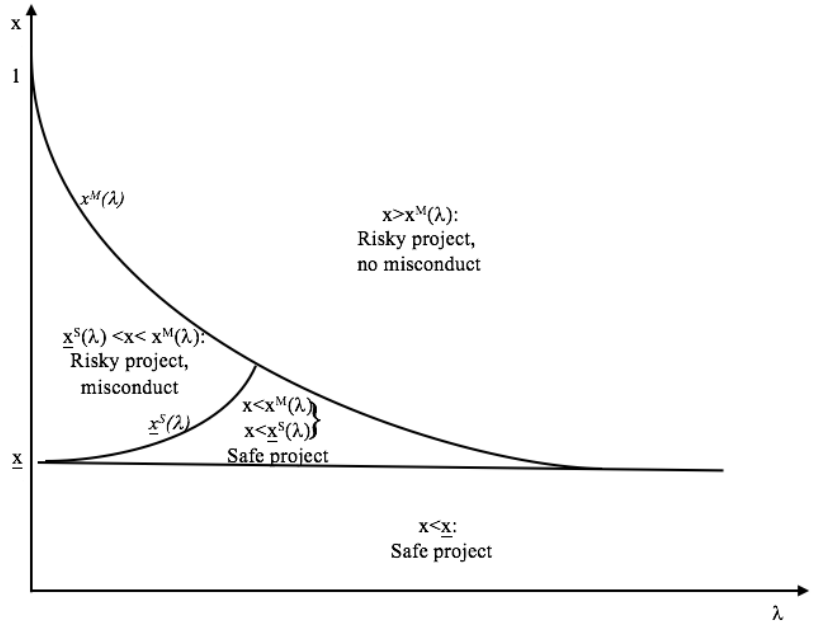
As it is assumed that $\Delta(H - L) < \delta\lambda C$, the short-term gains from risky project implementation now diminish relative to long-term costs, making the risky project less attractive. The resulting new threshold x for risky project implementation in this case

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, the possibility of misconduct 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. When the risky project has higher returns, $x^M(\lambda)$ separates the region in which the risk of detection can prevent managerial misconduct from the region where risky investments result in malpractice. When $x < x^M(\lambda)$, 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 the risky projects are sufficiently profitable $(x > \underline{x}^S(\lambda))$.

Figure 5: Misconduct, detection probability and project risk



Notes: This figure presents the regions in which the safe project is implemented, the risky project is implemented, and risky project is implemented and managers engage in misconduct arising for different values of long-term project risk $(1-x)$ and detection risk λ.

4.3. Extensions

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 the baseline model assumes that the bank is fully equity-funded, in this extension I consider the case in which the bank takes on debt: 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 that Assumption 1 holds and misconduct is costly to bank shareholders, when $x > x^M$ and misconduct can be prevented, shareholders prefer the risky project when

$$(p_h - p_L)(H - L) > \delta(1 - x)(L - D). \tag{10}$$

Comparing to the baseline case, debt makes risky projects more profitable by 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 downside risk 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

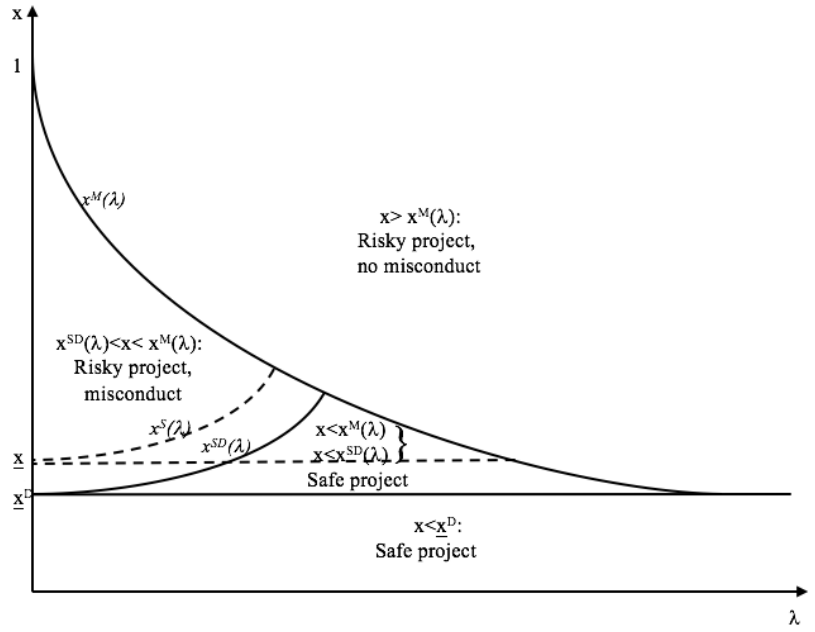
$$(p_h + \Delta - p_L)(H - L) > \delta(1 - x)(L - D) + \delta\lambda C. \tag{11}$$

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 higher returns, 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 6. Leverage leads to more risk-taking and misconduct both by 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.[23]

[23] 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. For example, in 2015 The Guardian quoted Robert Jenkins who had served on the Bank of England's Financial Policy Committee stating

Figure 6: Misconduct, detection probability and project type with bank leverage



Notes: This figure presents how bank risk-taking and misconduct change as bank leverage increases, the dashed lines representing these outcomes in the baseline case where the bank is fully equity-financed. Leverage both increases risk-taking for low values of x, and makes risk-taking profitable in the region where it was discouraged by conduct costs in the baseline case.

Constrained Regulators

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,

that "fear by the US authorities of a banking version of Arthur Andersen at a time of financial fragility" might explain the reluctance of regulators to pursue criminal investigations into bank behaviour.

misconduct is costly to shareholders when

$$\Delta(H - L) < \delta x \lambda C. \tag{12}$$

As higher long-term risk diminishes expected conduct costs, shareholders find malpractice more profitable as risk increases. Condition (12) 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

$$\frac{\Delta(H - L)}{\lambda\delta L} < \frac{\delta C - (p_H - p_L)(H - L)}{\delta L}. \tag{13}$$

In (13), the left-hand side is the condition for x which determines whether misconduct is profitable to shareholders when the risky project is undertaken, and the right-hand side is the threshold value of x below which the safe projects have higher returns than the risky ones when $C = L$. Therefore, condition (13) is satisfied only in settings in which misconduct is profitable to shareholders when the safe project would be implemented in any case (so that $x < \frac{\Delta(H-L)}{\lambda\delta L}$) which violates Assumption 1, or misconduct is always costly when the risky project is implemented.

Considering parameter values at which misconduct is not always profitable when the risky project is implemented, $x^M(\lambda) < x^S(\lambda)$ and shareholders might find misconduct profitable both in cases where they could not prevent it in the baseline model, and for parameter values where misconduct could be prevented by setting α sufficiently low and risky project implementation still achieved. These results imply that limits on the costs that regulators can impose on banks can increase the prevalence of misconduct. In the baseline model shareholders could not prevent misconduct for $x < x^M(\lambda)$, but 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.

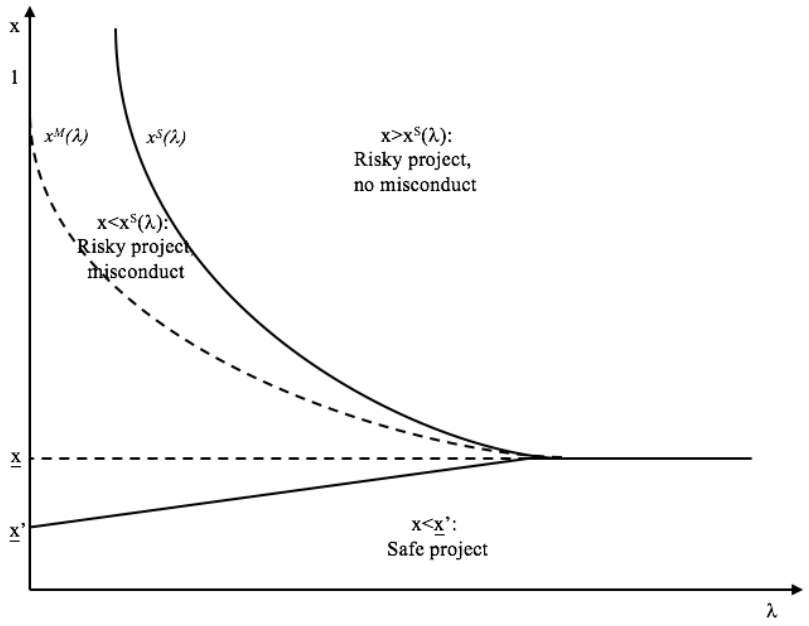
Does misconduct affect project choice when bank shareholders face lower financial penalties? First, as misconduct is not costly to shareholders when $x < x^S$, it does not reduce the profitability of risky project implementation in the region $\underline{x} < x < x^M(\lambda)$ where it could not be prevented and resulted in conduct costs in the baseline model. Second, as expected conduct costs to shareholders are now lower when the risky project

is implemented as fines are imposed only with probability x, misconduct increases the gains from risk-taking, and the two become complements. Shareholders now prefer the risky project when

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

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 higher expected returns. Figure 7 illustrates the resulting project choice and misconduct intensity for combinations of project risk and detection probability.

Figure 7: Misconduct, detection probability and project type when conduct costs imposed by regulators are constrained by bank returns



Notes: This figure presents how bank risk-taking and misconduct change when the conduct costs imposed by regulators are limited to bank returns at $t = 2$, the dashed lines representing the baseline case where C is not constrained. It shows that lower conduct costs can result in more risk-taking as it complements the returns from such projects, and can result in malpractice occurring for risk and detection levels at which it could have been prevented in the baseline case.

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

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.

These findings are important for 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, and pay more attention to the behaviours of risky firms. Meanwhile, the somewhat limited evidence on the relationship between executive compensation and malpractice is relevant in the light of recent initiatives to improve conduct through regulating bankers' pay. Namely, 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 in periods of high growth and risk-taking. The results in the theoretical model suggest that such regulations might be especially useful when compensation schemes in banks are designed to incentivise managerial 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 managers' 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 to 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.

References

Acharya, Viral, Marco Pagano and Paolo Volpin. 2016. Seeking Alpha: Excess Risk Taking and Competition for Managerial Talent. *Review of Financial Studies* 29(10), 2565-2599.

Alexander, Cindy R. 1999. On the Nature of the Reputational Penalty for Corporate Crime: Evidence. *The Journal of Law and Economics* 42:S1, 489-526.

Alexander, Cindy R. and Mark A. Cohen. 1999. Why do corporations become criminals? Ownership, hidden actions, and crime as an agency cost. *Journal of Corporate Finance* 5(1), 1-34.

Armstrong, Christopher S., David F. Larcker, Gaizka Ormazabal and Daniel J. Taylor. 2013. The relation between equity incentives and misreporting: The role of risk-taking incentives. *Journal of Financial Economics* 109(2), 327-350.

Bannier, Christina E. Eberhard Feess and Natalie Packham. 2012. Competition, Bonuses, and Risk-taking in the Banking Industry. *Review of Finance* 17 (2), 653-690.

Bénabou, Roland and Jean Tirole. 2016. Bonus Culture: Competitive Pay, Screening, and Multitasking. *Journal of Political Economy* 124(2), 305-370.

Bhagat, Sanjai, and Brian Bolton. 2014. Financial crisis and bank executive incentive compensation. *Journal of Corporate Finance* 25, 313-341.

Burns, Natasha and Simi Kedia. 2006. The impact of performance-based compensation on misreporting. *Journal of Financial Economics* 79(1), 35-67.

Carney, Mark. 2015. Building real markets for the good of the people. Speech given at the Lord Mayor's Banquet for Bankers and Merchants of the City of London at the Mansion House, London.

Cumming, Douglas, Robert Dannhauser and Sofia Johan. 2015. Financial market misconduct and agency conflicts: A synthesis and future directions. *Journal of Corporate Finance* 34, 150-168.

Cumming, Douglas, Alexander Peter Groh and Sofia Johan. 2018. Same rules, different enforcement: Market abuse in Europe. *Journal of International Financial Markets, Institutions and Money* 54, 130-151.

Comerton-Forde, Carole and Talis J. Putninš. 2011. Measuring closing price manipulation. *Journal of Financial Intermediation* 20(2) , 135-158.

DeMarzo, Peter M., Dmitry Livdan and Alexei Tchistyi. 2014. Risking Other People's Money: Gambling, Limited Liability, and Optimal Incentives. Working Paper.

DeYoung, Robert, Emma Y. Peng, and Meng Yan. 2013. Executive compensation and business policy choices at US commercial banks. *Journal of Financial and Quantitative Analysis* 48(1), 165-196.

Dyck, Alexander, Adair Morse and Luigi Zingales. 2010. Who Blows the Whistle on Corporate Fraud. *Journal of Finance* 65(6), 2213-2253

Dyck, Alexander, Adair Morse and Luigi Zingales. 2014. How Pervasive is Corporate Fraud?. Rotman School of Managment Working Paper No. 2222608

Egan, Mark, Gregor Matvos and Amit Seru. 2016. The Market for Financial Adviser Misconduct. NBER WP No. 22050

Erickson, Merle, Michelle Hanlon and Edward L. Maydew. 2006. Is There a Link between Executive Equity Incentives and Accounting Fraud?. *Journal of Accounting Research* 44, 113-143.

ESRB Report on misconduct risk in the banking sector, June 2015.

Fahlenbrach, Rüdiger, and Ren M. Stulz. 2011. Bank CEO incentives and the credit crisis. *Journal of financial economics* 99(1), 11-26.

Gao, Pengjie and Ronald E. Shrieves. 2002. Earnings management and executive compensation: a case of overdose of option and underdose of salary?. Working Paper.

Griffin, John M., Kruger, S. and Gonzalo Maturana. 2017. Do Labor Markets Discipline? Evidence from RMBS Bankers. Working Paper.

Hakenes, H. and Isabel Schnabel. 2014. Bank Bonuses and Bailouts. *Journal of Money, Credit and Banking* 46, 259-288.

Höffmann, Florian, Roman Inderst, and Marcus M. Opp. 2016. Only time will tell: A theory of deferred compensation and its regulation. Working Paper.

Johnson, Shane A., Harley E. Ryan and Yisong S. Tian. 2009. Managerial Incentives and Corporate Fraud: The Sources of Incentives Matter. *Review of Finance* 13(1), 115-145.

Kedia, Simi and Shiva Rajgopal. 2011. Do the SEC's enforcement preferences affect corporate misconduct?. *Journal of Accounting and Economics* 51(3) , 259-278.

Köster, H. and Matthias Pelster. 2017. Financial penalties and bank performance. *Journal of Banking & Finance* 79, 57-73.

Livne, Gilad Garen Markarian, Maxim Mironov. 2013. Investment horizon, risk, and compensation in the banking industry, Journal of Banking & Finance 37(9), 3669-3680

Morrison, Alan D., and John E. Thanassoulis. 2017. Ethical standards and cultural assimilation in financial services. Working Paper.

Nguyen, Duc Duy, Jens Hagendorff, and Arman Eshraghi. 2016. Can Bank Boards Prevent Misconduct?. *Review of Finance* 20(1), 1-36.

O'Connor, Joseph, Richard Priem, Joseph Coombs and Matthew K. Gilley. 2006. Do CEO Stock Options Prevent or Promote Fraudulent Financial Reporting?. *The Academy of Management Journal* 49(3), 483-500.

Peng, Lin and Ailsa R oell. 2008. Executive pay and shareholder litigation. *Review of Finance* 12(1), 141-184.

Philippon, Thomas and Ariell Reshef. 2012. Wages and Human Capital in the U.S. Finance Industry: 1909-2006. *The Quarterly Journal of Economics* 127 (4), 1551-1609

Povel, Paul, Rajdeep Singh and Andrew Winton. 2007. "Booms, Busts, and Fraud." *Review of Financial Studies*, 20(4): 1219-1254.

Sapienza, Paola and Luigi Zingales. 2012. A Trust Crisis. *International Review of Finance.* 12, 123-131.

Savaser, Tanseli and Elif Sisli-Ciamarra. 2017. Managerial Performance Incentives and Firm Risk during Economic Expansions and Recessions. *Review of Finance* 21(2), 911-944.

Thanassoulis, John. 2013. Industry Structure, Executive Pay, and Short-Termism. *Management Science* 59(2), 402-419.

Thanassoulis, J. and Misa Tanaka. 2017. Optimal pay regulation for too-big-to-fail banks. *Journal of Financial Intermediation.*

Treanor, Jill. 2015. Why putting bank bosses behind bars in still nigh on impossible. The Guardian, 23 May.

Wang, Tracy Yue, Andrew Winton and Xiaoyun Yu. 2010. Corporate Fraud and Business Conditions: Evidence from IPOs. *Journal of Finance* 65(6), 2255-2292.

Zingales, Luigi. 2015. Does Finance Benefit Society?. *Journal of Finance* 70(4), 1327-1363.

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.