Innocent unless proven guilty? Regulatory risk contagion in financial institution peer firms

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Abstract

We examine the recipient and peer firm stock market effects of UK regulatory authority enforcement actions. To measure these effects, we identify counterfactual firms which are equally likely to receive a sanction but do not do so. We use hand collected data in regard to the timing and nature of enforcement actions. Our results indicate a sizeable negative capital market reaction not only for recipient firms but also for peer firms. The enforcement actions which pierce the 'corporate veil', i.e. effect an individual within a firm, are related to no significant market reaction. We also find evidence that after the announcement, there is a consistent and pronounced negative drift in the market reaction for peer firms. These findings suggest that a regulatory sanction, imposed on a firm, can have widespread ramifications for peer firms in the financial system.

EFM Classification: 520, 540

Keywords: Regulatory risk, Enforcement actions, Abnormal stock returns, Peer firm effects

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1. Introduction

The banking sector and regulators have gone through a major overhaul since 2007 financial crisis. The crisis has made the regulators more pro-active as indicated by the increased regulation and communication between various stakeholders. This has resulted in fines up-to 321 Billion USD.[1] The quantum of fines not only has an adverse effect on the firms future cash flow and reputation, but also causes a trust deficit between different stakeholders as depicted in studies by (Cummins et al., 2006; Armour et al., 2017). Because the financial firms[2] are intertwined with each other due to inter-bank operations (Acemoglu et al., 2015), these enforcements[3] can carry a risk of 'contagion effect' or alternatively induce a 'competitive effect' on the peer firms. These enforcements serve the dual purpose of strengthening the financial system and reducing the informational asymmetry by informing about the behaviour that attracted sanction. Previous academic literature in regulatory risk has focused only on capital market reaction, reputational losses and to a certain extend its determinants on the sanctioned firms. We know less, however, about the effects of the regulatory sanctions and its interpretations by the market participants on the peer firms. This paper is the first to address the informational spillover of the regulatory sanction and its' impact on the financial system. The central theme of the paper is to provide an empirical framework to asses the 'contagion' or 'competitive effect' of regulatory enforcements and their impact on the financial firms.

Notwithstanding, the surge in the fine count since the global financial crisis and increasing regulatory activity, there has been no study on the spillover effect of these enforcements on the financial system. Our paper addresses this issue by analysing the enforcement actions and assessing the informational content of these communications. Furthermore, we

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[1] https://www.cnbc.com/2017/03/03/banks-have-paid-321-billion-in-fines-since-the-crisis.html

[2] We classify firms with SIC codes '6' and '7' as financial firms.

[3] Throughout the paper we have interchangeably used 'regulatory sanction' and 'enforcement action'.

assess the stakeholders' ability to comprehend this information by studying the spillover effect of the announcements. Media, academicians and practitioners have spoken a lot about the magnitude of penalty, increased vigilance but there has been no study to decipher the impact of enforcement on the 'peer' firms. The informational content of these enforcement actions has largely been ignored. The risk in the financial system which is primarily dominated by the banks is driven by two components i.e. systemic and idiosyncratic. While systemic risk plagues all the firms likewise, idiosyncratic risks can throw challenging problems for the firm. We argue that if the 'nature' of enforcement action was firm-specific it would not cause any 'contagion effect' in turn, there would be a possibility of a 'competitive effect' on the peer firms (Acharya and Yorulmazer, 2008). However, if these announcements had a systemic component, then enforcement on one firm would reduce information asymmetry for the peer firms. Market participants would update their 'priors' about the risk assessment of the firms operating in the same business line. This would cause a spillover effect in the banking channel. There is plenty of empirical evidence to depict the spillover effect caused by macro and industry specific events : Baig and Goldfajn, (1999) depict an increased correlation across different assets during the Asian financial crisis of 1997. Acharya, (2009) describe a theoretical framework in which negative externality of one bank has a herding effect on the others. Chakrabarty and Zhang, (2012) depict that banks with exposure to Lehman's had a significantly higher impact on their profitability and cash flows compared to firms with no exposure. Gande and Lewis, (2009) analyze the 'peer' firm affects in the context of class-action law suits in United States. In the regulatory literature, the idea of spillover has only been tested using US Federal Reserves communications[4].

We argue that it is conceivable that peer firms may benefit or, indeed, suffer a negative spillover as a result of such an announcement and information transfers. A benefit may arise for a peer firm due to the shift in stakeholders away from a penalized competitor (Lang

[4]Regulatory Communication' according to (Campbell et al., 2012) is defined as 'communication of regulatory authorities intentions'. Such statements are forward looking and provide an insight to the market participants about the course taken by the authorities.

and Stulz, 1992). Alternatively, a new fine raised on a competing peer institution may raise the propensity of such a penalty for similar firms operating in the same jurisdiction (Gande and Lewis, 2009). We extend this to study the effect of 'information spillover' if any caused by the regulatory announcements of FCA (Financial Conduct Authority). Even though these announcements are firm-specific, they reveal the categories in which the regulator is investigating into. Amiram et al., (2018) point out that 'enforcement actions come in industry specific enforcement waves'.

This paper address the above questions by using propensity score model and making use of the regulatory announcements. Using the like-to-like comparison method of Propensity Score Matching (PSM) (Eije et al., 2014), we evaluate the market reaction on the 'peer' firms, to the understand the significance of enforcement actions. To decide upon the 'peer firms' we use the firm-specific variables which determine reputational risk. Previous work to determine the reputational risk relies upon firm size, profitability, leverage as a measure of risk and volatility in the returns (Chernobai et al., 2011 and Fiordelisi et al., 2013). We also use year fixed effects and SIC codes as a control to account for the 'business line' in which the firm operates. The cumulative abnormal returns (CAR) around the enforcement announcement are used to measure the market reaction around the event and peer firms(Armour et al., 2017). We carry out robustness checks by winsorizing our CARs at 1%, 5% and 10%. By extending our event window to (-10,10) for the 'peer' firms, we explicitly rule out the possibility of a one time shock to the financial system due to the enforcements.

We analyze the impact of regulatory enforcements and their transmission in the United Kingdom (UK) which is primarily regulated by the FCA. The study of spillover on the UK financial system has its merit over other countries. First, the UK regulators use a watertight communication system. The regulators only make their decisions public once the misconduct has been proven as opposed to continuous media communication by SEC (Armour et al., 2017). This allows us to elicit a complete capital market reaction without any confounding effects caused due to prior announcements. Second, the Financial Services

Act 2012[5], states that FCA's objective is to 'protect and enhance the integrity of the UK financial system'. FCA achieves this objective through various means of communication that include 'Enforcement Actions', 'Warning Notices','Business Plans', Annual Reports', 'Dear CEO letters' and 'Thematic Reviews'.

This paper primarily focuses on the 'Enforcement Actions' and 'Warning Notices' as they carry monetary penalty information.

UK regulatory landscape was a victim of the 'political/regulatory capture'[6] as studied by (Ferran, 2014, De Marco and Macchiavelli, 2016). FSA had proven highly ineffective in navigating through the challenges posed to the banking sector, which resulted in its restructuring to FCA (Ferran, 2014).[7] The newly formed FCA alongside the regulation of banks also had an added responsibility to address consumer protection in financial services. This clause increased the efficiency of the regulators, as now the onus was also on the banks to self-regulate. Our data too concurs this with an increase in the frequency and magnitude of fines post the establishment of FCA.

We use a rich sample of 171 regulatory enforcements from 2009-2019 to study their impact on the financial system. We find two common themes prevailing in these sanctions, *i) sanctions which are systemic in nature.* For example, the LIBOR scandal revealed cartelization of the unscrupulous traders, managers and banks to manipulate the interbank rates. This also revealed the vulnerability of the banking system to regulatory risk. The punitive measures taken by the FCA against ICAP[8] had a contagion effect as it opened the pandora box for future actions against the banks involved. *ii) sanctions which are idiosyncratic but reveal the business line the regulator is looking into.* We empirically test

[5] https://corpgov.law.harvard.edu/2013/03/24/financial-services-act-2012-a-new-uk-\financial-regulatory-framework/

[6] (Stigler, 1971) define it as '..a regulatory agency, though perhaps created to pursue public interest goals, later comes under the dominant influence of - is captured by - the industry subject to regulation'

[7] https://citywire.co.uk/new-model-adviser/news/deficient-and-inadequate-fsa-failed\-to-stop-hbos-collapse/a861316

[8] https://www.fca.org.uk/news/press-releases/icap-europe-limited-fined-%C2%A314-million-significant-failings-relation-libor

test this idea first by looking at the market reaction across all the 395 peer firms decided based on the SIC code. Further, we take a granular approach to narrow our definition of peer firm using PSM approach. For the SIC based approach, we find a statistically significant negative CAR around the peer firms using the 'pure signals'. For the PSM approach, we too find a statistically significant negative CAR, but this time the effect is more pronounced and does not mean revert ex-post the event. We find these results hold when we extend the window size from (-1,1) to (-10,10).

In the past few years we have witnessed that apart from penalizing the firms for their wrong-doings, regulators have been enforcing penalties on the individuals, banning and going a mile to announce imprisonment too.[9] While there exists comprehensive literature on the motivation to commit fraud. Efendi et al., (2007) find that frauds in the form of misstatements increases if the CEO has greater in-the-money stock options. Liu, (2016) look at the cultural aspect of the executives to establish the likelihood of an individual committing fraud. The 'rogue' behaviour by the insider has also resulted in substantial penalty to the firm. For e.g. in case of the LIBOR and FX scandal, fines were levied simultaneously to the firm and individual. The question that remains unanswered is : Whether the market cares about an individual going 'rouge' or 'committing fraud'?. We test this idea from the shareholder's perspective. We find that enforcement actions which pierce the 'corporate veil' depict no statistically significant market reaction, indicating that the market views them as isolated events. They do not penalize the firm for failing to control this behaviour within the firm.

We also explore the 'reputational loss' the firm incurs due to enforcement.[10] The firm

[9]https://www.fca.org.uk/news/press-releases/fca-takes-first-criminal-action-against-individual-acting-unlicensed-consumer

[10]The Basel Committee on Banking Supervision defines it as "the risk arising from negative perception on the part of customers, counter-parties, shareholders, investors, debt-holders, market analysts, other relevant parties or regulators that can adversely effect a bank's ability to maintain existing, or establish new, business relationships and continued access to sources of funding (eg through the interbank or securitisation markets."(Goodhart, 2011)

loses its 'reputational capital'[11]. This idea has been articulated clearly by (Armour et al., 2017). They focus on the reputational effect of enforcements on all the firms, irrespective of the industry. While their data predates 2010, we begin our analysis from 2009. We focus solely on financial firms rather than the entire sample. One merit to our sample selection is that most of the sanctions to financial firms came post 2009. This gives us a good enough sample to conclude. 71% of our sample is dominated by financial firms. Though the accounting framework does not put a numeric value on reputation as in case of 'goodwill'. This loss extends beyond the loss of future cash flows. It has a detrimental effect on the quality of its relationship with the stakeholders and erodes the faith in financial system (Fombrun et al., 2004 and Amiram et al., 2018). Our main findings include the 'contagion' effect on the non-recipient firms due to the enforcement action on the recipient firms. We also find no evidence of significant market reaction on the firms due to the wrongdoings of an individual. We find that the reputational loss is 12 times the loss incurred due to enforcement by the FCA. This magnitude is consistent with the study carried out by (Armour et al., 2017).

Our paper contributes to the existing literature in a number of ways. We go beyond the existing literature on misconduct which primarily focuses on the capital market reaction around operational loss events. We study the impact of the regulatory sanctions not only on the event firms, but also the peer firms. Previous literature in this area focuses only on the firm in question. We depict that these enforcements are not idiosyncratic in nature, but have a contagion effect. We make an important methodological contribution to asses the informational content of these sanctions which has largely been ignored. We show that while availing of a simple information asymmetry argument between regulators and stakeholders, investors can update their priors on the riskiness of the entire industry in which the firm operates. We also examine various facets of the regulatory communication when there is resolution of uncertainty and when it pierces the corporate veil.

[11] (Amiram et al., 2018) define it as 'present value of improvement in net cash flow and lower cost of capital that arises when the firm's counterparties trust the firm will uphold its explicit and implicit contacts and will not act opportunistically to their counterpaties' dertriment'

The remainder of the paper is organized as follows. In section 2, we describe and motivate our hypothesis. Section 3 discusses the regulatory framework in UK along with the data and sample selection procedure. Section 4 presents our empirical design and methodology. In section 5 we discuss the results, while Section 6 concludes.

2. Testable Hypotheses

A capital market reaction to an announcement of an enforcement action, we hypothesize, can be expected to impart a significant and negative affect in recipient firm equity.

In the first instance, the market can incorporate information pertaining to any monetary loss associated with the enforcement action. This would include the size of the punitive loss itself but also the cost to the financial institution to adjust its risk management such that the misconduct is not repeated.

In addition, a negative capital market affect can follow due to the tarnishing of the financial institution's reputation in relation to the enforcement action announcement (Cummins et al., 2006; Armour et al., 2017). The news inherent in the announcement can reduce the information asymmetry between the market and bank managers, to the detriment of a firm's market value.[12]

Collectively, the above arguments suggest that regulatory enforcements on the financial firms, can cause a reputational damage.

Our initial major hypothesis, can thus be stated:

Hypothesis 1 (H1): *Regulatory sanctions imposed on a financial firm will lead to a negative capital market reaction.*

On the other hand, it may turn out that a positive (or no) market reaction is evident after an enforcement action announcement. This can follow, in the case of a zero market reaction, as the market was already aware of the pending announcement and had

[12] Fiordelisi et al. (2013) show that US and European bank operational loss announcements, which include regulatory sanctions, are also associated with reputational losses. In addition, Zeume (2017) show that enacting a new anti-corruption law, such as the UK Bribery Act 2010, can have firm value impact due to a likelihood of sanctions.

already assimilated this information into prices. A positive market reaction is also conceivable. It can turn out that the market was already aware of the pending enforcement action announcement but not of the magnitude of its punitive nature.[13] Therefore, the announcement can resolve related market uncertainty and, hence, a positive capital market reaction can ensue. As a result, the ultimate announcement can be deemed good news in the market relative to what might have transpired.

We investigate, by way of a sub-hypothesis, enforcement actions' capital market effects, where an individual employee of a financial institution, and not the institution itself, is found to be guilty of misconduct.[14] Becker (1968) details a risk and reward trade-off in respect to banking misconduct at the individual level. It is conceivable that misconduct at the individual level, once identified and punished, can have no subsequent consequence for firm value. Alternatively, as shown in Dimmock et al. (2018), negative externalities can follow in respect to increases in the propensity to misconduct of fellow employees. Such negative externalities can impact financial institution value accordingly. As a result, we test whether enforcement actions at the individual level, can have financial institution value implications.

We now turn to our second main hypothesis test, which is in relation to peer firm effects. It is reasonable to conjecture that there can be a market reaction in the equity of peer financial institutions. Gande and Lewis (2009) show that shareholders partially anticipate class action lawsuits based on lawsuit filings against other firms in the same industry and capitalize part of these losses prior to a lawsuit filing date.[15] This is in

[13] We identify instances where evidence of the misconduct can have been assimilated by the capital market as a firm is being investigated for misconduct in a country other than the UK or when the misconduct is self-reported. If an investigation is commenced by the FCA, PRA or SFO and is known to the market participants, via the financial media, before the 'final notice', we can also identify this scenario.

[14] Financial Conduct Authority sanctions individuals, including prison sentences, and ensures that such individuals are accountable for their actions.

[15] Bessler and Nohel (2000) show, relatedly, that a bank's dividend policy can signal the quality of its loan portfolio, and that of comparable peer banks.

line with a informed 'contagion effect' of regulatory enforcement actions as discussed in Acharya and Yorulmazer (2008).[16] Specifically, regulatory risk can exhibit a significant systematic component. Once one financial institution is subject to an enforcement action, comparable firms can be deemed, by market participants, more susceptible to receiving such an enforcement action. New evidence of a regulatory focus, for instance, and a related enforcement action can, hence, focus capital market attention on this eventuality for peer firms.

This line of reasoning leads to our second main hypothesis, which can be stated as follows.

Hypothesis 2 (H2): *Regulatory sanction imposed on a financial firm can have a negative impact on capital market valuations of peer firms.*

Alternatively, Acharya and Yorulmazer (2008) also indicate, in their theoretical framework, the possibility of a 'competition effect', which can account for a positive capital market reaction of peer firms to enforcement action announcements. A benefit may arise for a peer firm due to the shift in stakeholders away from a penalized competitor. When the market participants, not least block holder investors, are aware of the firms financial wrongdoings, they may elect to exit a firm's ownership structure.

3. Regulatory Framework in United Kingdom, Data and Sample Selection Procedure

3.1. ***Regulatory Enforcements and their characterstics***

United Kingdom's financial market is primarily regulated by FCA[17], (Prudential Regulatory Authority) PRA[18] and Serious Fraud Office (SFO)[19]. Prior to the establishment of FCA, FSA was the sole regulator of banking and insurance. It also had the added

[16]For instance, in 2013 the Financial Services Authority raised a fine on Clydesdale Bank Plc to the order of 20 million pounds. Further allegations of a similar nature snowballed into penalties worth 40 billion pounds raised on Llyods Bank Plc, Barclays, RBS, HSBC, Santander, Bank of America and others.

[17]https://www.fca.org.uk/

[18]https://www.bankofengland.co.uk/prudential-regulation

[19]https://www.sfo.gov.uk/

responsibility of the financial supervision. But the failure of the regulator to protect UK from the 2008 financial crisis lead to it dissolution. UK moved to a 'twin peak' model of reform. The then Governer of Bank of England described it as follows:

" ... financial crisis has shown that combining prudential regulation with the oversight of consumer protection and market conduct did not work. Separating them - the so-called 'twin peaks' model of financial regulation - is the right direction of reform"

The newly formed objectives of FCA were : consumer protection in financial services, regulation of consumer credit, market regulation, maintaining market confidence along with regulation of firms under the jurisdiction of PRA.

FCA through various modes of communication regularly informs the market participants about the changes in the regulation. It also gives a comprehensive documentation of the areas it is going to focus into through 'Thematic review, Dear CEO letters, Warning Notices, Annual reports and Enforcement Actions'. FCA begins its investigation by requiring the firms to give regular submission of its business activities. The period in which the regulator collects all the information is called 'infraction period'. There is no public announcement at this point about the firms for which the information is being collected. Once, the regulator has conducted its investigation it gives time to the firm for an appropriate response. Post that it releases a 'final notice' which contains a detailed summary of the nature of misconduct along with the fine amount if any. During this entire process, there is no public announcement except when there might be a cross-border regulator involved.[20] A typical timeline of FCA investigation and announcement is shown in figure 1. Also (Armour et al., 2009) point out that unlike United States class action lawsuits are virtually absent in UK.

[Please Insert Figure 1 about here.]

[20]That is except for in a very small minority of instances. For example, with the TSB in 2016 - sale of life insurance to long standing customers, RBS(IT) in 2013 and HBOS regarding Senior Managers. Also during LIBOR and FX manipulation there were pre-announcements.

This leaves us with sanctions that are *exogenous* in nature, both for the management as well as the shareholders. The nature of the announcement allows us to capture any 'contagion effect' effectively for the peer firms.

3.2. ***Data and Sample Selection Procedure***

The data for the analysis was hand collected from the FCA, PRA and SFO websites by studying the 'Enforcement Actions' for the period between 2009-2019. It comprises of all the firms operating within the UK jurisdiction. The sample contains the date for the enforcement action, name of the firm, name of the individual (if applicable), fine amount, nature of misconduct, BASEL category (Business Lines), a complete description of the nature of misconduct and the coercive action taken by the firm. These announcements are readily available to the market participants via 'News' at FCA website and then 'Press Releases' or 'Statements'. Alternatively the firms would communicate any decision by the regulator via 'Regulatory News Service (RNS)' of the London Stock Exchange. The FCA regulatory announcements provide a detailed description of the sanction. It lists down the business line involved, nature of the misconduct and most importantly the categories it looked into. These three things together help the market participants decipher information on future areas of investigation. We attribute these aspects of the announcement to cause an information spillover. The table 1 is a typical representation of the information contained in the 'final notice'.

[Please Insert Table 1 about here.]

The data comprises of 696 enforcement actions on all the firms operating within the UK jurisdiction[21]. In case of a sanction on a private arm of publicly listed institution, we attribute it to the listed entity. The final working sample was obtained by filtering the data using multiple criteria as described in Table 2. To measure the capital market reaction around the enforcement action, we screen the data for publicly listed financial firms. We define 'financial firms' as firms with SIC codes beginning with '6' and '7'. The firm should

[21] 95.5% of the enforcement actions were issued by the FCA, 3.08% by the SFO and 1.3% by the PRA.

be public at the time of the enforcement action. The firm is retained in the sample if it was acquired by another firm or de-listed later. We remove firms for which the misconduct was identified after its de-listing, even though the misconduct might have occurred when it was listed. To elicit the reaction due to the firms wrongdoing, we remove sanctions on individuals within a firm. This leaves us with 130 enforcement actions. On the lines of (Armour et al., 2017) these enforcements can be broadly categorized as i) *Final Settlement*, ii) *Restatement of the previous settlement*, iii) *Cross-Country regulatory intervention*, iv) *Enforcements due to public litigation* and v) *Media rumours or private investigation*. The major problem with the regulatory risk database is the 'look-ahead' bias caused due to ambiguity in the announcements. If the nature of the announcement is anything but 'final settlement', it will increase the uncertainty for the stakeholders. Any subsequent price reaction would not reflect the true implication of the sanction but only compound the uncertainty (Karpoff et al., 2014).

To mitigate this uncertainty action we follow the following procedure -

- Verify that the sanction is a final settlement and no subsequent room is left for further negotiation.
- Ensure that enforcement penalties were issued without any prior leakage of information. This data was cross-checked with FACTIVA[22] and LexisNexis.
- Enforcements issued due to the conviction for the same/similar misconduct by the firm in a different jurisdiction is removed from the sample.
- Enforcements subsequent to a private investigation or public litigation is removed from the sample.

To avoid any 'survivorship bias' in the sample we retain the enforcements on de-listed or merged firms. The highest number of fine counts in the Basel Business Lines was recorded in the 'Retail Banking', where as the maximum fine per signal was recorded in

[22]https://www.dowjones.com/products/factiva/

the 'Wealth Management' section. For the Basel Event Type, the maximum fine count was recorded in 'Execution, Delivery and Process Management' where as maximum fine per signal was recorded in 'Employment Practices and Work Place Safety'. Post the screening using the above described process, we obtain 75 events pertaining to financial firms for which the enforcement is distinct. These enforcements are distinct, but the sanctioned firms had confounding announcements during the same period. Screening for this, leaves us with a sample of 69 firm events. The final sample contains one sanction by the SFO and none by PRA as all of them were known prior to the announcement.

[Please Insert Table 1 A about here.]

The fines increase linearly since 2009 and peaking in 2014. It is then followed by a gradual decline. Table 1B provides additional information for 75 'pure signals'. Based on the 'Basel Business Units' maximum number of enforcement is in the Asset Management (25.6%), followed by Insurance (17.9%) which is followed by other business lines which are relatively small by percentage. The average fine per Business Line reveals a different picture. Even though commercial banking is only (3.78%) of the sample by frequency, the fine amount per enforcement is the highest at 71.75 million dollars, followed by Custody Services at 64.59 million dollars. We observe from the table in that categories where the fine is quite frequent the fine amount isn't quite as large as when these fines are for specific Basel Business Units. This informs us that categories which are seen as repeat offenders do not attract large penalties. But the ones that are out of the blue have a larger impact. The distribution based on the SIC is as follows, 66% of the sanctions are related to banking sector where as the rest is focused on asset management, insurance and advisory. The level of flocking observed at a superficial level does indicate that certain Basel Categories attract more fines and the rest. To decide upon the peer firms, we look at all the firms operating within UK jurisdiction. From a list 4383 firms, we screen a list of 395 firms, with the SIC codes '6' and '7'. It is from these 395 firms, we decide the counterfactual firms base on the propensity score matching. We report all the SIC classification in the Appendix A3.

[Please Insert Table 1 B about here.]

4. Empirical Design

4.1. ***Are enforcement actions exogenous?***

The enforcement actions occur due to numerous possibilities. It can occur due to lack of internal controls, oversight by management, rogue trading or a deliberate attempt to engage in misconduct. When the regulator collects documents from the firm about its trading activities, it does not disclose this information to the public nor does it assume the firm is at fault while it is looking into these documents. Post this, the regulator requires an explanation from the firm if something substantial comes up. Finally, it releases a public document about its findings and sanction if any. Based on the above process, it is clear that regulator takes action for a misconduct occurred at time *'t'*. While the enforcement sanction comes at time *'t+k'* where *'k'* is several time steps ahead of *'t'*. This removes any chance of simultaneity, as the regulator only takes punitive action for the particular misconduct itself. At most, it can be argued that firms change their internal behaviour, but this would not have an effect on the firms' future misconduct.

However, one can argue that there is a possibility of self-selection problem as the firm might choose to engage in a misconduct. The literature on the incentives of the management to engage in misconduct is not clear, as various authors have presented conflicting evidence. (Efendi et al., 2007) show that equity based compensation for management results in higher misconduct, while (Armstrong et al., 2010) find no such evidence. However, in our sample we have seen two particular instances when it was clear that management was taking advantage of the lapses in the system. One was the LIBOR rate and the other was PPI scandal. Under such circumstances of self-selection, (Kai and Prabhala, 2007) argue that matching methodology is less plausible due to the concern of endogeneity. Because of unobserved firm traits, eliciting a causal inference from the counterfactual can be troublesome.

4.2. ***Argument for Exogeneity***

The decision by the management to engage in the misconduct is only revealed once the investigation by the regulator is complete. This has two components first, the regulator

has to identify that the misconduct took place. Second, this identification is a random event. The management itself does not know if and when there would be an announcement pertaining to the misconduct. Therefore, the regulatory announcement is as much as an exogenous shock to the firm as it is to the shareholders. The argument for *Misconduct Provision* also does not hold in this case, as the provision for the sanction is accounted once the 'final notice' is out. In the case of the UK regulator, this argument is seemingly more important as the notice is the final verdict for *a* particular misconduct. Hence, matching firms with similar propensities to receive sanction using publicly available information, allows us to obtain a consistent estimate of the capital market effect. We hence, nuance the concern raised by (Kai and Prabhala, 2007). Self-selection bias in inference is a matter of concern only if two points are satisfied. First, the event is endogenous and second, if the decision makers with respect to the event, and those who determine the impact of the event, have equal access to the same information set.

4.3. ***Propensity Score Framework***

We adopt a new counterfactual, which explicitly accounts for the estimated propensity of a firm to receive sanction, based on information publicly available to the capital market.

To do so, we match on the propensity score (Rosenbaum and Rubin, 1983 and Rubin and Thomas, 1992), p, which is estimated as the conditional probability obtained from a logistic regression of a binary variable that takes the value of 1 if the firm has received a sanction and zero otherwise, on a set of covariates that explain the propensity of a firm to receive sanctions.[23]

$$p(event_k, t = 1) = f(X_k, t - 1)$$

The logistic regression is described as-

$$Pr(Y_{ijt} = 1|X) = \frac{e^{\alpha+\beta X_{ijt}+\delta+\gamma}}{1 + e^{\alpha+\beta X_{ijt}+\delta+\gamma}}$$

[23]Our choice of variables is informed from a large body of literature that examines the propensity to pay dividends. Details on the variables used and the underlying literature are presented in section 4.4.

Here, i, j, t stand for firm, month and year respectively. The set of matching covariates, X, are observed in the month-year *t-1*. δ stands for the year-fixed affects and γ for the four digit SIC code. Once the propensity scores are estimated from the logistic model, we adopt nearest-neighbor matching, within each year, to identify comparable counterfactual firms, prior to the announcement of an enforcement sanction. Conditional on the assumption of information asymmetry between the regulators and firms' management and investors, and our ability to adequately capture investors' expectations using publicly available information, our counterfactual firms would have a comparable *ex-ante* likelihood (from the perspective of capital market participants) to receive a sanction. Investors would, therefore, be unable to distinguish between the event firm and the matched counterfactual firm prior to the self-selection to the event.

We interpret the difference in stock price changes between the event firms and their matched counterfactual firms as the capital market surprise component of the enforcement, which is determined by the investors' interpretation of the new information that has been revealed through the event, and their subsequent trading decisions.

4.4. ***Determinants of the propensity to receive regulatory sanction***

Previous work on the determinants of reputational risk have provided evidence that a financial firm's risk level is influenced by: (1) Firm Size; (2) Profitability; (3) Leverage; (4) Past stock price performance; (5) Distress Risk; (6) Liquidity.

(Chernobai et al., 2011 and Fiordelisi et al., 2013) find that large firms have greater reputational losses and have higher arrival rates for operational losses. They argue that large firms have better tools to avoid misconduct but undertake complex operations. This complexity increases the chance of misconduct as it is a tedious task to monitor them. With financial firms dealing with complex derivative products and operating in different geographies, this risk can be more pronounced. (Dechow et al., 1996) show that misconduct due to earnings management have serious capital market and reputational consequences once identified. They argue that firms which manage their earnings have an incentive to avail low cost of financing. (Jin and Myers, 2006) depict that management has a higher incentive for oversight when the earnings are high. We use Return on Equity (ROE) as

our proxy for high earnings/profitability. For the financial sector, capital adequacy ratio can be used as a measure of leverage. It is defined as the ratio of bank's available capital to the risk weighted assets. It is a measurement of the bank's ability to absorb losses without affecting its' day to day operations. The past stock performance is used as a measure of volatility. It is measured as the standard deviation of the returns on a one year rolling basis. Higher volatility indicates the vulnerability of the institution. On the lines of (Chernobai et al., 2011 and Fama and French, 1992) we include market-to-book (MTB) ratio as a proxy for distress risk. (Palazzo, 2012) find that firms which have a higher need for external financing in future have a higher tendency to hoard cash. We proxy this using the measure 'Cash and Short term investments to Total Assets'. Additionally, to determine the propensity score if we only use the firm specific variables there is a likelihood that the matches won't take into account the business line the firm operates in. Following the approach in (Helwege and Zhang, 2015) we control for four digit SIC codes, which very clearly specifies the major business undertaking of the firm.

4.5. ***Event Study Methodology and Reputational Loss***

To comprehend the Capital Market Reaction a basic 'Event Study Framework' is carried out. We calculate the share price reaction around the announcement of misconduct (Fama et al., 1969). The market index is used as the benchmark, however given that most of the firms are financial in nature a banking index can also be used as a proxy. The abnormal return (AR) is calculated as follows:

$$AR_{i,t} = R_{i,t} - \alpha_{i,t} - \beta R_{m,t}$$

where $R_{i,t}$ and $R_{m,t}$ are the firms' stock return and the market returns on day t, respectively. The coefficients α_i and β_i are estimated using least squares regression of $R_{i,t}$ a on $R_{m,t}$. To estimate the coefficients, we use a one year calendar period -261 to -2 relative to the announcement day. The average abnormal return for each day t in the event window is computed as :

$$AR_t = \frac{\sum_i AR_{i,t}}{N}$$

where N is the number of days over which abnormal return is calculated. The CAR around the days (-1,0,1) where '0' being the event day is calculated as :

$$CAR(t_1, t_2) = \sum AR_t$$

.

We measure the reputational cost using the methodology (residual approach) followed by (Armour et al., 2017 and Karpoff and Lott Jr, 1993). The reputational loss is calculated as follows :

$$ReputationalLoss = R_{i,t} - \alpha_{i,t} - \beta R_{m,t} - (\frac{Fine_{i,t} + Compensation_{i,t}}{MarketCap_{i,t}})$$

Regulatory announcements by the FCA also includes the compensation details in the final notice. This compensation is the amount that the firm has to pay the stakeholders affected due to the misconduct. We only consider the amount announced in the 'Final Notice' if any. We ignore cases where there was an additional compensation for the same crime.

5. Results

We first discuss the market reaction to the 'pure signal' event firms. We next turn our attention to the peer firms, matched on the four digit SIC code and propensity score matching. We find that the enforcements result in a significant loss to shareholders of not only the event firms, but also the peer firms.

5.1. ***Abnormal Market Reaction***

We focus on the event window (-1,1) to measure the Cumulative Abnormal Reaction (CAR). Due to the difference in time zones between the regulator and the event firms we use this window. This window takes into account the possibility of leakage of information. In table 2, we report our findings for the 69 'pure signal' firm events. The CAR (-1,1) is -1.58% and statistically significant at 1% level (t-stat is -3.93). The magnitude of CAR and statistical significance for 'pure signals' are consistent in comparison with and (Armour et al., 2017). The reputational loss is -1.01% (t-stat is -2.85) and statistically significant

at 1% level. The 'fine+compensation' amounts to -0.57. Every dollar of fine leads to a reputational loss of 8 dollars. Our findings are comparable to (Armour et al., 2017). Our results indicate that the hypothesis (*H1*) holds true in this case.

[Please Insert Table 2 about here.]

5.2. ***Peer Firm Effect***

We first report the results for the peer firms based on the 4 digit SIC classification. Second, to elicit the peer firm effect on firm characteristics we carry out the propensity score matching.

In table 3 (panel A), we report the effect of the regulatory enforcements on the peer firms as identified using the four digit SIC code[24]. The CAR (-1,1) is -0.48% and statistically significant at 5% level (t-stat is -2.43). In table 3 (panel B), we report the results for the winsorized sample. The CAR (-1,1) is -0.46% and statistically significant at 1% level (t-stat is -3.29).

[Please Insert Table 3 about here.]

Following the studies conducted by (Gillet et al., 2010 and Fiordelisi et al., 2013) to verify for any potential information leak prior to the announcement, we extend our sample window to (-10,10). From figure 1, we can observe that in both these cases we observe that that the price action takes place around the event window (-1,1) only. Furthermore, we observe that post the event, there is no reversal in the price action for the 'pure signals' and the 'peer firms'. The drift is more pronounced for the event firms than that of the peer firms.

[Please Insert Figure 1 about here.]

[24] We have used restriction 4 from table 2, which includes 75 firm events. We obtain our peer firms on these 75 firm events rather than 69. The reason being, these 75 enforcements are 'pure signals' but 5 of them had to removed due to confounding news at the firm level.

In order to obtain the peers based on the characteristics of the event firms, we carry out a propensity score match. Appendix A2 provides information for the logistic regression used for PSM. A positive coefficient on the explanatory variables would indicate a higher propensity to receive sanction and vice versa. Thus for coefficients the interpretation is that a 1 unit increase in x increases y by $100 * (e^{\beta X}-1)\%$. Our results indicate that the propensity to receive fine is positively related to firm size, equity volatility and capital adequacy ratio. It is negatively related to profitability (ROE) and market-to-book. The propensity to receive fine is positive and statistically significant for larger firms. Given that financial firms operate in different jurisdictions and business lines, it is no surprise that the market perceives them to have a higher propensity to receive sanctions. Of all the variables, it is the equity volatility which has the highest coefficient and is positively related to the sanction. A 10% increase in volatility would increase the propensity to receive sanction by 13.8%. Higher equity volatility is associated with higher risk. Further, a surprising result we obtain is that well capitalized financial firms i.e. firms with higher Capital Tier 1 Ratio would be perceived as risky from a regulatory point of view. This result can be explained via the Capital Requirement Directives (CRD)[25], which requires the financial firms (specifically banks) to hold 8% of their capital as tier 1. Given that these rules were implemented in the aftermath of 2007 financial crisis, all of the firms in our data would be having higher capital adequacy ratio. We observe that the past enforcements is statistically significant and positively associated with the propensity to receive sanctions. The market-to-book ratio, ROE and cash to total asset ratios are not statistically significant. But the sign on the coefficient is consistent with the prior literature in this field. As a robustness measure the sign on our coefficient and statistical significance hold post the introduction of year and SIC fixed effects.

We match our propensity score for all the 'pure signals'. We obtain 36 matches as peer firm. One reason we obtain a small set of peers is because of the confounding news of profitability or firm-level event that would have rendered our estimation of capital market reaction obsolete. However, the sample size is consistent with the prior regulatory

[25] https://www.fca.org.uk/firms/crd-iv

literature. Our findings stated in table 4 indicate that the peer firms have a CAR of -1.03% at an aggregate level and statistically significant at 1% (t-stat -2.81). We also find that CAR around the announcements of the 'event firms' for which we obtained a counterfactual is -1.37% and statistically significant (t stat is -3.1). This reaction to enforcements prove that they carry a systemic component which can help the investors understand the risk level of their firms. Our results establish the above stated hypothesis (*H2*) on the effect of regulatory sanctions on the peer firms.

In table 5, we further provide the distribution of CARs around enforcement actions for event and peer firms matched on four digit SIC code for pure announcements. Our results indicate a consistent finding for the 'event' and 'peer' firms, across the SIC financial classification.

[Please Insert Table 4 and 5 about here.]

5.3. ***Enforcements which pierce the corporate veil***

To understand the implication of sanctions which pierce the corporate veil, we report its CAR in table 6 (Panel A). The results for the event window (-1,1) is 0.6% (t-stat is 1.35). These results are not statistically significant. The results for the peer firms This indicates that even though the regulator has widened its focus to hold individuals accountable, the market sees it as the same. Shareholders don't hold the firms responsible for the misconduct. With the increased focus to hold individuals more accountable for their actions, the regulator has introduced sanctions such as banning and imprisonment too. The implications of which would be seen in future sanctions.

[Please Insert Table 6 about here.]

5.4. ***Robustness***

A major problem with the event study literature is presence of a few outliers. They can distort the interpretation of the results. We follow the methodology used in (Armour et al., 2017) to measure the consistency of our results. We winsorize our abnormal market reactions at 1%, 5% and 10% levels. We further trim our results at 1%, 5% and 10%

levels for the 'pure signals' and the 'peer firms'. The results for the winsorized abnormal reactions at 10% is reported in the internet appendix tables IA4 and IA5. Our results indicate that the statistical significance improves and the sign of the CARs don't change on the application of robustness checks.

6. Conclusion

In this paper, we evaluate the spillover effects caused in financial firms due to enforcement actions. We construct a novel database on these enforcements in the UK with detailed firm-level information on the fine amount, nature of misconduct, period of misconduct and prior information on them if any. Previous studies in this field have primarily looked at the reputational loss of the event only. We provide an econometric framework using which the effect of sanctions on the 'peer firms' can be measured precisely.

We analyze these enforcement shocks using a propensity score matching method. The peer firm is selected on the firm level data. Our research design also takes into account the qualitative factors (e.g earnings announcement, dividend announcement, ongoing investigation) around the event, which can render our matching obsolete. This method allows us to isolate the 'peer firm' which is equally likely to receive a sanction. Our results indicate that enforcements have a spillover effect on the financial system. We find that 'peer firms' have a statistically significant CAR of -1.03% around the event window (-1,1). The contagion is stronger for commercial banks, brokers and investment banks. Another important finding is that the extended post-announcement drift is even more pronounced. These findings are of significant importance from the financial stability point of view. These announcements are not idiosyncratic but 'systemic' in nature. Market participants can update their 'priors' about a firm by observing sanctions. These regulatory sanctions have significant agency costs which are borne by the shareholders.

This research also studies in isolation the reputational cost to a firm due to the 'rouge actions' of an individual within a firm. We find no statistically significant results. This indicates that when the sanctions pierce the 'corporate veil', the market treats it as such. It does not penalize the firm for it. The firms for which there was prior rumors or an on

going investigation, depict statistically significant positive CAR on the announcement of sanction. We attribute this effect to resolution of uncertainty.

The informational spillover is stronger for the financial firms operating within the same business line. The effect becomes even more pronounced when controlling for the firm characteristics and business lines. Overall, our results indicate that regulatory enforcements have informational content which not only affects the 'event' firms, but also the 'peer' firms.

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Table 1A: Sample Selection Procedure

Data Screening Description	Frequency of Enforcement Actions
Original dataset: Enforcement Actions by the U.K. regulators during 2009-2019.[a]	696
Restriction 1: Enforcement Actions affecting publicly listed firms.[1]	196
Restriction 2: Enforcement Actions affecting publicly listed financial firms (including individuals within the firm).[2]	171
Restriction 3: Enforcement Actions affecting publicly listed financial firms (excluding individuals within the firm).[3]	130
Restriction 4: Enforcement Actions for financial firms without any prior information.[4]	75
Restriction 5: Final Enforcement Actions (pure announcements) for financial firms without confounding news about the company (unrelated to the regulatory notice).[5]	69

Notes: U.K. regulatory authorities include Financial Service Authority (FSA), Financial Conduct Authority (FCA), Prudential Regulatory Authority (PRA) and Serious Fraud Office (SFO).[a]

1. Of the 196 enforcement actions affecting the publicly listed firms, 25 of them are non-financial firms. Firms with the SIC codes '6' and '7' are considered 'Financial Firms' in our sample.

2. Of the 171 enforcement actions affecting the financial firms, 41 of them affect the individuals within the firm.

3. 130 enforcement actions comprises of both the 'pure announcements' as well as events with known prior information.

4. 75 enforcement actions comprises of the enforcements without any prior information. To identify them we correspond the dates with a search on the LexisNexis database and Google News.

5. 69 enforcement actions comprises the 'pure announcements' without any confounding news. We exclude firms for which we have dividend, earnings and sale of assets which confounds with the timing of enforcement announcement.

Table 1B: Descriptive Statistics

Table 1B reports the frequency of enforcement actions (EA) sanctioned by the Financial Conduct Authority (FCA) formerly known as Financial Service Authority (FSA) and Serious Fraud Office (SFO) of UK. Panel A reports the frequency of EA's according to Basel Business Units and Insurance, average fine per Basel Business Units and Insurance, and the frequency of signals which is a public communication undertaken by the regulatory authorities along a Basel Business Unit and Insurance. In Panel B we report the mean, the maximum and minimum values of market capitalisation, and the financial penalty expressed as a percentage of market capitalisation. The sample consists of the 69 enforcement actions obtained after applying the filters in accordance to Table 1A. Our sample also contains one announcement by the SFO. The Basel Business Line disaggregation sums up to 70 as one enforcement pertaining to a particular firm can be segregated to different categories.[a]

Panel A

Basel Business Units and Insurance	**Frequency of Enforcement Actions**	**Average Fine (million dollars)**
Asset Management	27	41.52
Trading and Sales	8	15.05
Retail Banking	8	35.65
Retail Brokerage	6	52.38
Agency Services	4	64.59
Payment and Settlement	3	3.45
Commercial Banking	3	71.75
Insurance	11	12.54
Sum	70	298.71

Panel B

Variable	**Mean**	**Minimum**	**Maximum**
Fine Amount (Million Dollars)	21.18	0.00	204.17
Fine Amount (as % of market capitalization)	0.58	0.00	23

Notes: FSA fined HSBC group £3 million for data security failings. £0.875 million was fined to the asset management section and £2.125 million was fined to the insurance section.[a]

Table 2: CARs around Enforcement Actions

Table 2 (Restriction 5) reports CARs around the announcement of enforcement action. These enforcement actions are 'exogenous' in nature as neither the management nor the shareholder's knew about the potential sanction. The CARs are reported for the total sample in 3 event windows (0), (0, 1), (-1,1). The t-stats is reported for the CARs with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. The table reports it for the whole sample, for the time period between 2009-2019. The whole sample contains 69 regulatory events which were associated with the firms having SIC codes '6' or '7'. This sample contains one announcement by the SFO and the rest 68 by the FCA. Any non-financial firm was removed from this sample.

Sample Size	Window Size	Market Reaction	t-stats
2009-2019	(0)	-0.43%	-1.82*
	(0,1)	-1.18%	-3.45***
	(-1,1)	-1.58%	-3.93***

Table 3: CARs around Enforcement Actions for peer firms matched on the four digit SIC codes

Table 3 reports CARs around the 'peer' firms matched on the 4 digit SIC code. The CARs are reported for the total sample in 3 event windows (0), (0, 1), (-1,1). The t-stats is reported for the CARs with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. The table reports it for the whole sample, for the time period between 2009-2019. The enforcement actions are levied by FCA and SFO.
The model 'a' (Restriction 4) contains CARs for all the 'peer' firms pertaining to financial institutions with four digit SIC code beginning with '6 and 7'. This includes all the enforcement actions on the financial institutions without prior public knowledge. The total number of peer firm events are 807.
The model 'b' (Restriction 4) reports CARs post winsorizing the abnormal returns at 90% as a robustness check. It contains all the 'peer' firms matched on enforcement announcements which were exogenous in nature for the management as well as the stakeholders. The total number of peer firm events are 807.

Sample Size	Window Size	Market Reaction	t-stats
2009-2019[a]	(0)	0.04%	0.43
	(0,1)	-0.25%	-1.54
	(-1,1)	-0.48%	-2.43**
2009-2019[b]	(0)	0.03%	-0.31
	(0,1)	-0.24%	-2.27**
	(-1,1)	-0.46%	-3.29***

Figure 1: CARs (-10,10) for the pure enforcement action around the event firms and the matched peer firms

Figure 1 shows cumulative abnormal returns (CARs) over the 21 days, from -10 to +10, around the announcement of enforcement action for the event and matched peer firms based on the four digit SIC code. Cumulative abnormal returns are based on market model parameters.

Figure 1

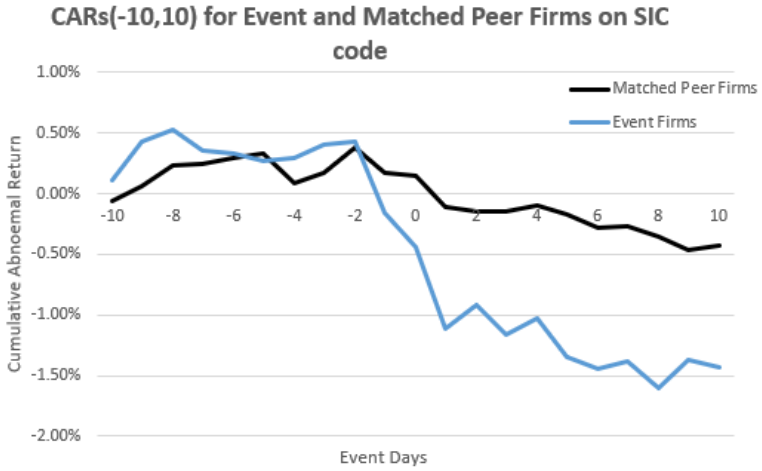

Table 4: CARs around Enforcement Actions for peer firms matched using Propensity Score Matching (PSM)

Table 4 (Restriction 5) reports CARs around 'peer' firms which were obtained by a Propensity Score Matching. The event firm in the sample was firms with pure announcement effects. The CARs are reported for the total sample in 3 event windows (0), (0, 1), (-1,1). The t-stats is reported for the CARs with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. It reports CAR for all the 36 'peer firms' matched using propensity scores with the 'recipient firms'.

Sample Size	Window Size	Market Reaction	t-stats
2009-2019[a]	(0)	-0.69%	-2.93***
	(0,1)	-0.88%	-2.94***
	(-1,1)	-1.03%	-2.81***

Table 5: Distribution of CARs around Enforcement Actions for event and peer firms matched on four digit SIC code for pure announcements.

Table 5 reports the distribution of CARs for pure enforcement actions by event and peer firms. The peer firms are obtained from the Compustat Banking Universe. The firms are matched on the four digit SIC code. The CARs are reported for the event window (-1,1). The t-stats is reported for the CAR with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively.

Industry	SIC	Event Firms	t-Stats	Matched Peer Firms	t-Stats
Commercial banks	6020	-1.10%	-2.09**	-0.601%	-2.07**
Brokers and dealers	6200	-2.19%	-1.14	-1.08%	-7.80*
Investment banks	6211	-2.58%	-2.32**	-0.86%	-2.25*
Investment advice	6282	-2.47%	-2.37**	-0.32%	-1.09
Life insurers	6311	-1.15%	-2.36**	0.75%	1.15
Property and casualty insurers	6331	-3.64%	-1.39	-0.19%	-1.81
Insurance agents	6411	-1.14%	NA	1.07%	NA
Investment Offices	6722	-2.41%	NA	-0.76%	NA

Table 6: CAR around Enforcement Actions for Individuals within the firm and its peers

Table 6 (Panel A - Transition from Restriction 2 to 3) reports CARs around the announcement of enforcement actions. These enforcement actions are levied on individual within the firms i.e enforcements which pierce the corporate veil. The CARs are reported for the total sample in 3 event windows (0), (0, 1), (-1,1). The t-stat is reported for the CARs with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. The table reports it for the whole sample, for the time period between 2009-2019. The whole sample contains 41 regulatory events which were associated with the firms having SIC codes '6' or '7'. Any non-financial firm was removed from this sample.
Table 6 (Panel B - Transition from Restriction 2 to 3) reports CARs for 'peer' firms in the same four-digit SIC industry when an enforcement action is announced. The CARs are reported for the total sample in 3 event windows (0), (0, 1), (-1,1). The t-stat is reported for the CAR with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. The table reports it for the whole sample, for the time period between 2009-2019. The whole sample contains 41 regulatory events which were associated with the firms having SIC codes '6' or '7'. Any non-financial firm was removed from this sample.

Panel A

Sample Size	**Window Size**	**Market Reaction**	**t-stats**
2009-2019	(0)	0.00%	0.016
	(0,1)	0.1%	0.256
	(-1,1)	0.6%	1.359

Panel B

Sample Size	**Window Size**	**Market Reaction**	**t-stats**
2009-2019	(0)	0.06%	0.38
	(0,1)	0.07%	0.34
	(-1,1)	0.01%	0.06

Appendix A1 : Description of Enforcement Actions

The Table reports a detailed description for each of the 75 'pure signals'. For each case, we report the following information: i) the date of the press statement; ii) the name of the sanctioned company; iii) the fine and the total compensation in USD ; iv) a brief description of the nature of misconduct; v) our classification of the Service Line as per the BASEL norms.

FineDate	Company Name	Subsidiary Name	Fine Amount ('000)	Nature of Misconduct	Service Line
06 January 2009	Aon plc	Aon Limited	8183	FSA fines Aon Limited £5.25m for failings in its anti-bribery and corruption systems and controls.	Insurance
17 July 2009	HSBC Holdings plc	HSBC Life (UK) Limited	4964	HSBC Group 2009 £3 million fines for information security failings.	Insurance
05 August 2009	UBS Group AG	UBS Group AG	12469	FSA fines UBS £8million for failing to prevent employees carrying out unauthorised transactions with customer money.	Wealth Management & Investment Advisory
19 August 2009	Barclays PLC	NA	3819	Barclays 2009 fines of £2.45 million for failures in transaction reporting.	Trading & Sales
16 November 2009	Nomura Holdings, Inc.	Nomura International Plc	2728	FSA fines Nomura	Trading. & Sales
15 December 2009	The Toronto-Dominion Bank	Toronto Dominion Bank (London Branch)	10910	Managing director banned and fined £750,000 for mis-marking.	Trading & Sales
20 January 2010	Standard Life Plc	Standard Life Assurance Limited	3819	FSA fines Standard Life £2.45m for serious systems and controls failures.	Insurance
08 April 2010	Credit Suisse Group AG	NA	2728	FSA issues fines totalling £2.2m for transaction reporting failures.	Brokerage
08 April 2010	Nomura Holdings, Inc.	Instinet Europe Limited	1637	FSA issues fines totalling £1.2m for transaction reporting failures.	Brokerage
22 April 2010	Close Brothers Group plc	Winterflood Securities Limited	6262	Fundamental-E Investments Plc share ramping.	Trading & Sales
27 April 2010	Commerzbank AG	Commerzbank AG	927	FSA fines Commerzbank for failures in transaction reporting.	Brokerage
25 May 2010	JPMorgan Chase & Co.	J.P. Morgan Securities Limited	51933	FSA levies largest ever fine for client money breaches.	Wealth Management & Investment Advisory
02 August 2010	Royal Bank of Scotland	NA	8728	FSA fines Royal Bank of Scotland Group £5.6m for UK sanctions controls failings.	Cash Payments, Clearing & Settlement
19 August 2010	Zurich Insurance Group Ltd	Zurich Insurance Plc	3546	FSA fines Zurich Insurance £2,275,000 following the loss of 46,000 policy holders' personal details.	Insurance
25 August 2010	Societe Generale Group	Societe Generale	2455	FSA fines Societe Generale £1.575 million for failures in transaction reporting.	Brokerage
08 September 2010	The Goldman Sachs Group, Inc.	Goldman Sachs International	27276	Goldman Sachs fined for failing to notify FSA enforcement. proceedings in the US.	Support Services
15 December 2010	Aegon N.V.	Scottish Equitable Plc	4364	Scottish Equitable PLC Fined by the FSA.	Insurance
15 December 2010	Deutsche Bank AG	DB UK Bank Ltd	1309	NA	Mortgage
11 January 2011	The Royal Bank of Scotland Group plc	NA	4364	FSA fines RBS and NatWest £2.8m for poor complaint handling.	Retail Banking
14 January 2011	Barclays PLC	Barclays Bank PLC	12001	FSA fines Barclays £7.7 million for investment advice failings. and secures as much as £60 million in redress for customers	Wealth Management & Investment Advisory
24 January 2011	Barclays PLC	Barclays Capital Securities Limited	1757	FSA levies £1.12m fine on Barclays Capital for client money. breaches.	Custody Services
23 May 2011	Lloyds Banking Group plc	Bank of Scotland Plc	5455	Bank fined for mishandling of complaints about retail investment products.	Wealth Management & Investment Advisory
21 July 2011	Willis Group Holdings Plc	Willis Limited	10747	Leading insurance broker fined for anti-bribery and corruption systems and controls failings surrounding payments to overseas third parties.	Insurance
25 October 2011	Credit Suisse Group AG	Credit Suisse (UK) Limited	9274	FSA fines Credit Suisse UK £5.95 million for systems and control failings.	Wealth Management & Investment Advisory
07 November 2011	Royal Bank of Scotland	Coutts & Company	9819	Coutts fined £6.3m for failings relating to its sale of an AIG fund.	Wealth Management & Investment Advisory

Appendix A1 : Description of Misconduct Cases (Continued)

FineDate	Company Name	Subsidiary Name	Fine Amount ('000)	Nature of Misconduct	Service Line
16 February 2012	Banco Santander, S.A.	Santander UK Plc	2338	Santander fined £ 1.5 million for failing to clarify FSCS cover on structured products.	Wealth Management & Investment Advisory
23 March 2012	Royal Bank of Scotland	Coutts & Company	13638	Coutts fined £8.75 million for anti-money laundering control failings.	Wealth Management & Investment Advisory
02 May 2012	Legg Mason, Inc.	NA	5455	FCA and SEC fined Martin Currie Group for failing to manage a conflicts of interest between clients.	Investment Advisory
04 May 2012	HBZ Group	Habib Bank AG Zurich	818	FSA fines Habib Bank £525,000 and money laundering officer £17,500 for anti-money laundering control failings.	Cash Payments, Clearing & Settlement
08 May 2012	MS&AD Insurance Group	Mitsui Sumitomo Insurance Company (Europe) Ltd	5214	FSA bans executive chairman of wholesale insurer and imposes fines of almost £3.5million on the firm.	Insurance
27 June 2012	Barclays PLC	Barclays Bank PLC	92737	Barclays 2012 Fine $453 million.	Commercial Banking
11 September 2012	BlackRock, Inc.	BlackRock Investment Management (UK) Limited	14858	FSA fines BlackRock Limited £9.5m for client money breaches.	Asset Management
18 October 2012	Sun Life Financial Inc	Sun Life Assurance Company	935	FSA fines Sun Life £600,000 for with-profits governance failings.	Asset Management
19 October 2012	Lloyds Banking Group plc	Bank of Scotland Plc	6546	Bank of Scotland fined £4.2 million for failing to keep accurate mortgage records.	Mortgage
26 November 2012	UBS Group AG	UBS Group AG	46290	FSA fines UBS £29.7 million for significant failings in not preventing large scale unauthorised trading.	Trading & Sales
27 March 2013	Prudential plc	Prudential plc	21820	Prudential failure to inform regulator of 2010 acquisition plans.	Support Services
27 March 2013	Prudential plc	The Prudential Assurance Company Limited	24938	Prudential failure to inform regulator of 2010 acquisition plans.	Support Services
28 March 2013	EFG International AG	EFG Private Bank Ltd	6546	FCA fines EFG Private Bank £4.2m for failures in its anti-money laundering controls.	Wealth Management & Investment Advisory
10 May 2013	JPMorgan Chase & Co.	J.P. Morgan International Bank Limited	4795	J.P. Morgan International Bank fined for systems and controls failings in its wealth management business.	Wealth Management & Investment Advisory
05 June 2013	Friends Provident Group Plc	Sesame Limited	9400	FCA Sesame £6m for failing to ensure advice given to customers was suitable and for poor systems and controls.	Wealth Management & Investment Advisory
08 August 2013	Guaranty Trust Bank plc	Guaranty Trust Bank (UK) Limited	818	FCA fines Guaranty Trust Bank (UK) Ltd £525,000 for failures in its anti-money laundering controls.	Cash Payments, Clearing & Settlement
02 September 2013	Aberdeen Asset Management PLC	NA	11210	Aberdeen Asset Managers and Aberdeen Fund Management fined £7.2 million for failing to protect client money.	Asset Management
12 September 2013	AXA S.A.	AXA Wealth Services Ltd	2809	FCA Fines AXA Wealth Services Ltd over £ 1.8 Million.	Wealth Management & Investment Advisory
25 November 2013	SEI Investments Company	SEI Investments (Europe) Limited	1403	FCA fines SEI Investments (Europe) Limited £900,200 for client money breaches.	Custody Services
09 December 2013	Lloyds Banking Group plc	Lloyds TSB Bank plc	43701	Lloyds Banking Group 2013 fine of £28 million for serious incentive failings.	Insurance
19 December 2013	Jardine Lloyd Thompson Group plc	JLT Specialty Limited	2924	JLT fined £ 1.8 million by the FCA for unacceptable approach to bribery & corruption risks from overseas payments.	Insurance
23 January 2014	Standard Bank Plc	Standard Bank Plc	11908	Standard Bank PLC fined £7.6m for failures in its anti-money laundering controls.	Commercial Banking

Appendix A1 : Description of Misconduct Cases (Continued)

FineDate	Company Name	Subsidiary Name	Fine Amount ('000)	Nature of Misconduct	Service Line
30 January 2014	State Street Corporation	NA	35669	State Street overcharging scheme for transition management services.	Asset Management
24 March 2014	Banco Santander, S.A.	Santander UK Plc	19292	Santander fined £12.4m for widespread investment advice failings.	Investment Advisory
23 May 2014	Barclays PLC	Barclays Bank PLC	40576	Barclays fined £26m for failings surrounding the London Gold Fixing.	Trading & Sales
16 June 2014	Credit Suisse Group AG	Credit Suisse International (CSI)	3738	Credit Suisse & Yorkshire Bulding Society Financial Promotions Fine.	Wealth Management & Investment Advisory
07 August 2014	Aegon N.V.	Stonebridge International Insurance Limited	13051	FCA fines Stonebridge £8.4m in relation to sales of insurance policies.	Insurance
27 August 2014	Royal Bank of Scotland	NA	22560	RBS and NatWest 2014 fines for failures in mortgage advice process.	Mortgage
22 September 2014	Barclays PLC	Barclays Bank PLC	58829	Barclays fined £38 million for putting £16.5 billion of client assets at risk.	Custody Services
24 February 2015	Aviva plc	Aviva Investors Global Services Limited	27442	Aviva Investors FCA fine for conflicts of interest	Asset Management
14 April 2015	National Australia Bank Limited	Clydesdale Bank PLC	32229	Clydesdale Bank fined £20,678,300 for serious failings in PPI complaint handling.	Insurance
14 April 2015	The Bank of New York Mellon Corporation	NA	196384	FCA fines BNY Mellon London branch £126 million for failure to comply with the Custody Rules.	Custody Services
22 April 2015	Bank of America Corporation	Merrill Lynch International	20707	FCA fines Merrill Lynch International £13.2 million for transaction reporting failures.	Support Services
25 November 2015.	Barclays PLC	Barclays PLC	112327	FCA fines Barclays £72 million for poor handling of financial crime risks	Wealth Management & Investment Advisory
25 November 2015	Standard Bank Plc	Standard Bank Plc	50773	SFO fines Standard Bank for Bribery.	Commercial Banking
22 February 2016	WH Ireland Group plc	WH Ireland Limited	1870	FCA fines and restricts WH Ireland Limited for market abuse risks.	Wealth Management & Investment Advisory
07 April 2016	Qatar Islamic Bank	Qatar Islamic Bank (UK) Plc	2159	The PRA imposed a fine of £ 1,384,950 on Qatar Islamic Bank for failings in assessing, maintaining and reporting about its financial resources to the regulator.	Support Services
17 January 2017	HSBC Holdings plc	NA	6234	HSBC voluntarily agrees to provide approximately £4 million redress for historical debt collection practices.	Retail Banking
30 January 2017	Deutsche Bank AG	Deutsche Bank AG	254171	FCA fines Deutsche Bank £ 163 million for serious anti-money laundering controls failings.	Brokerage
25 January 2018	Interactive Brokers Ltd	Interactive Brokers (UK) Limited	1282	FCA fines IBUK for failure to report suspicious transactions and internal control.	Brokerage
19 December 2018	Banco Santander, S.A.	Santander UK	42640	FCA fines Santander UK a fine of £32.8 million for failing to return deceased customers' money.	Custody Services
21 June 2019	Lloyds Banking Group plc	HBOS	55611	Lloyds fined £45.5mln by FCA for failing to disclose HBOS fraud suspicions.	Support Services

Appendix A1 : Logistic Regression to determine the propensity of receiving an enforcement action by the FCA

Appendix A2 reports results of logit regressions to determine the propensity of receiving a propensity sanction by the FCA. The logistic regression is described as - $Pr(Y_{ijt} = 1|X) = \frac{e^{\alpha+\beta X_{ijt}+\delta+\gamma}}{1+e^{\alpha+\beta X_{ijt}+\delta+\gamma}}$ Here, i, j, t stand for firm, month and year respectively. The set of matching covariates, X, are observed in the year *t-1*. δ stands for the year-fixed affects and γ for the four digit SIC code. The dependent variable, TREATMENT is a dummy variable that equals one if the firm has received an enforcement action by FCA and zero otherwise. We obtain our independent variables that can characterise the determinants of receiving a sanction as indicated in Chernobai et. al(2012).'Log(Market Cap)' is the natural logarithm of the total number of outstanding shares multiplied by the share price.'Cash& Short term to TA' is the measure of liquidity in the institution where TA is defined as Total Assets. 'ROE' stands for 'Return on Equity'. 'Capital Adequacy Ratio ' is the ratio of bank's available capital to the risk weighted assets. 'RetSD' stands for the standard deviation on returns. 'Market to Book' is the ratio of market value of equity to the book value of equity. The first model does not account for the Year and SIC fixed effects. The second model only accounts for the Year fixed effects where as the third model accounts for both Year and SIC fixed effects. The data-set spans from 2007-2019. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels respectively. T-stat is reported in parentheses below the coefficients.

	Dependent variable:		
	Treatment		
	(1)	(2)	(3)
Log(MarketCap)	0.284***	0.304***	0.249***
	(9.827)	(10.210)	(7.050)
Cash&Short term to TA	-0.039	0.249	-0.034
	(-0.063)	(0.405)	(-0.049)
ROE	-0.001	-0.001	-0.001
	(-0.018)	(-0.022)	(-0.013)
Capital Adequacy Ratio	0.046***	0.051***	0.036***
	(3.905)	(4.028)	(2.593)
RetSD	1.307***	0.986**	1.103**
	(3.769)	(2.271)	(2.532)
Market to Book	-0.001	-0.001	-0.001
	(-0.261)	(-0.292)	(-0.244)
Enforcement_Action$_{t-1}$	0.766***	0.721***	0.618***
	(4.072)	(3.727)	(3.234)
Constant	-5.955***	-6.134***	-5.284***
	(-19.193)	(-12.778)	(-9.054)
Pseudo R-Squared	0.291	0.304	0.321
Fixed effects?	None	Year	Year and Sic
Observations	3910	3910	3910

Appendix A3 : Distribution of Event and peer firms by four digit SIC code

Appendix A3 (Panel A) reports the distribution of all Enforcement Actions by event and peer firms. The frequency of the event firms by SIC code and the matched peer firms on four digit SIC code is reported. The peer firms are obtained from the Compustat Banking Universe.
Appendix A4 (Panel B) reports the distribution of Pure Enforcement Actions by event and peer firms. The frequency of the event firms by SIC code and the matched peer firms on four digit SIC code is reported. The peer firms are obtained from the Compustat Banking Universe.

Panel A

	Industry	Event Firms	Matched Peer Firms
Commercial banks	6020	68	697
Personal finance companies	6141	3	18
Business finance companies	6153	1	1
Brokers and dealers	6200	4	90
Investment banks	6211	22	360
Investment advice	6282	14	271
Insurance Carriers	6300	1	3
Life insurers	6311	10	66
Property and casualty insurers	6331	2	9
Title insurance firms	6361	1	3
Insurance agents	6411	1	4
Investment Offices	6722	1	10
Data Processing (Financial)	7370	1	5
Business Services (Financial)	7389	1	14
	Total	130	1551

Panel B

	Industry	Event Firms	Matched Peer Firms
Commercial banks	6020	41	407
Personal finance companies	6141	0	0
Business finance companies	6153	0	0
Brokers and dealers	6200	2	27
Investment banks	6211	12	171
Investment advice	6282	8	129
Insurance Carriers	6300	0	0
Life insurers	6311	8	49
Property and casualty insurers	6331	2	9
Title insurance firms	6361	0	0
Insurance agents	6411	1	4
Investment Offices	6722	1	10
Data Processing (Financial)	7370	0	0
Business Services (Financial)	7389	0	0
	Total	75	806

Internet Appendix for

Innocent unless proven guilty? Regulatory risk contagion in financial institution peer firms

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May 8, 2021

This Internet Appendix reports the results of supplementary and robustness tests as described below:-

Table IA1- CARs around Enforcement Actions for mixed enforcements (Restriction 3).

Table IA2: CARs around Enforcement Actions (Restriction 4).

Table IA3: Table IA3: CARs around Enforcement Actions for peer firms matched on the four digit SIC codes (Restriction 3).

Table IA4: CARs around Enforcement Actions for the recipient and peer firms matched on Propensity Score Matching (Robustness).

Table IA5: CARs around Enforcement Actions for the 'pure announcements' (Robustness).

Table IA1: CARs around Enforcement Actions for mixed enforcements

Table IA1 (Restriction 3) reports CARs around the announcement of enforcement action. The CARs is reported for the total sample in 3 event windows (0), (0, 1), (-1,1). The t-stats is reported for the CARs with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. The whole sample contains 130 enforcement actions. These sanctions exclude the enforcement actions on the individuals within the firm. The enforcement actions are levied by FCA and SFO. They only include firms with SIC codes beginning with '6' and '7' i.e. financial firms only.

Sample Size	Window Size	Market Reaction	t-stats
2009-2019	(0)	-0.13%	-0.95
	(0,1)	-0.37%	-1.73*
	(-1,1)	-0.23%	-0.87

Table IA2: CARs around Enforcement Actions

Table IA2 (Restriction 4) reports CARs around the announcement of enforcement action. These enforcement actions are 'exogenous' in nature as neither the management nor the shareholder's knew about the potential sanction. The CARs are reported for the total sample in 3 event windows (0), (0, 1), (1,1). The t-stats is reported for the CARs with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. The table reports it for the whole sample, for the time period between 2009-2019. The whole sample contains 75 regulatory events which were associated with the firms having SIC codes '6' or '7'. This sample contains one announcement by the SFO. Any non-financial firm was removed from this sample.

Sample Size	Window Size	Market Reaction	t-stats
2009-2019	(0)	-0.38%	-1.71*
	(0,1)	-0.96%	-3.36***
	(-1,1)	-1.29%	-3.71***

Table IA3: CARs around Enforcement Actions for peer firms matched on the four digit SIC codes

Table IA3 (Restriction 3) reports CARs around the announcement of enforcement action. The CARs are reported for the total sample in 3 event windows (0), (0, 1), (-1,1). The t-stats is reported for the CAR with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. The table reports it for the whole sample, for the time period between 2009-2019. The enforcement actions are levied by FCA and SFO. The model 'a' contains CARs for all the 'peer' firms pertaining to financial institutions with four digit SIC code beginning with '6 and 7'. This includes all the enforcement actions on the financial institutions with and without prior public knowledge. The model pertains to 130 enforcement actions.

Sample Size	Window Size	Market Reaction	t-stats
2009-2019[a]	(0)	0.05%	0.73
	(0,1)	-0.06%	-0.58
	(-1,1)	-0.14%	-0.95

Table IA4: CARs around Enforcement Actions for the 'recipient' and 'peer' firms matched on Propensity Score Matching (Robustness)

Table IA4 reports CARs around 'recipient' and'peer' firms which were obtained by a Propensity Score Matching. The event firm in the sample was firms with pure announcement effects. The CARs are reported for the total sample in 3 event windows (0), (0, 1), (-1,1). The t-stats is reported for the CAR with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. Model 'a' reports CARs post winsorizing the abnormal returns at 90% as a robustness check for all the 36 'peer firms' matched using propensity scores with the 'recipient firms'. Model 'b' reports CARs post winsorizing the abnormal returns at 90% as a robustness check for all the 'recipient' matched using propensity scores.

Sample Size	Window Size	Market Reaction	t-stats
2009-2019[a]	(0)	-0.67%	-4.45***
	(0,1)	-0.86%	-3.53***
	(-1,1)	-1.01%	-3.51***
2009-2019[b]	(0)	-0.74%	-3.17***
	(0,1)	-1.21%	-4.66***
	(-1,1)	-1.77%	-5.75***

Table IA5: CARs around Enforcement Actions for the 'pure announcements' (Robustness)

Table IA5 reports CARs post winsorizing the abnormal returns at 90% as a robustness check. The CARs are reported for the total sample in 3 event windows (0), (0, 1), (-1,1). The t-stats is reported for the CAR with the significance level of *, ** and *** depicting 10%, 5% and 1% respectively. The table reports it for the whole sample, for the time period between 2009-2019.

Sample Size	Window Size	Market Reaction	t-stats
2009-2019[a]	(0)	-0.38%	-2.12**
	(0,1)	-1.05%	-4.99***
	(-1,1)	-1.38%	-5.79***