Three Essays on the Role of Information and Monitoring Intermediaries in Capital Markets

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Janja Brendel, M.Sc.

President of Humboldt-Universität zu Berlin:
Prof. Dr.-Ing. Dr. Sabine Kunst
Dean of the School of Business and Economics:
Prof. Dr. Daniel Klapper

Reviewers:
1. Prof. Dr. Joachim Gassen
2. Prof. Dr. Ulf Brüggemann

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Janja Brendel

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Introductory Summary

Literature has begun to explore the relation of financial development and economic performance that indicates a positive role for capital markets and institutions (e.g., Levine and Zervos [1998], Rajan and Zingales [1998]). However, we still do not fully understand the mechanisms that are in place through which the capital markets, its participants, and the related institutions could have an impact on the economic performance of firms and hence, the real sector. As pointed out by Zingales [2003], this lack of understanding has made it difficult to draw policy conclusions from prior literature. It remains important to examine possible mechanisms and channels through which capital markets operate, and how they could influence economic performance.

Generally, capital markets satisfy two important roles in an economy. Firstly, they can facilitate the allocation of capital. Secondly, they may help to promote governance and control by offering various mechanisms for information gathering and monitoring decision-makers inside the firms. In its allocation function, it ideally should help to channel resources to agents with the most profitable investment opportunities, and it should help to offer risk pooling and risk-sharing. Via its governance function, the financial system allows monitoring and information production services being offered that help to mitigate various agency problems, such as the lemons problem (Akerlof [1978]) which creates demand for information intermediaries (e.g., equity research analysts, institutional investors, media) who are incentivized to engage in information production to uncover managers' information. Information intermediaries and other institutions may help to mitigate the consequences of imperfect information and moral hazard by facilitating and engaging in monitoring and information production.

Prior literature has covered different players in the capital markets, such as banks (e.g., Fama [1985], Shan, Tang, and Winton [2019], and Marshall, McCann, and McColgan [2014]), equity research analysts as "gate keepers" (e.g., Moyer, Chatfield, and Sisneros [1989], and Yu [2008]), but also investors, such as activist investors (Brav, Jiang, and Kim [2015]) and short sellers (e.g., Efendi, Kinney, and Swanson [2005], Desai, Krishnamurthy, and Venkataraman [2006], Drake, Rees, and Swanson [2011], Karpoff and Lou [2010], Massa, Zhang, and Zhang [2015], and Pownall and Simko [2005]) that may engage in the monitoring and information gathering and production in the capital markets. Early work on information intermediaries has

already shown that intermediaries can shape the information environment in capital markets (e.g., Brennan and Subrahmanyam [1995], and Piotroski and Roulstone [2004]).

With the last-mentioned group, the short sellers, there has been an ongoing unsolved debate on their role as potential information intermediaries in the capital markets. On the one hand, prior literature describes short sellers as sophisticated, relatively more informed market participants compared to other investors (e.g., Drake et al. [2011], Reed [2013]). They are recognized to play an important role in correcting mispricing and identifying corporate malfeasance. Like equity research analysts, short sellers spend a substantial amount of their time and resources in analyzing companies and may well help to close the information gap, especially when other intermediaries such as equity research analysts are missing (Pownall and Simko [2005]). On the other hand, critics say that short sellers may engage in over-selling activities and that some short sellers may be exposed to limited cognitive processing abilities (e.g., Henry and Koski [2010], Sun and Xu [2018]). Also, regulators have acted against short sellers. The SEC named manipulators as a motivation for proposing short-position disclosure regulations, noting that short selling bear raids were thought by some to have caused the 1929 market crash and the subsequent inability of the market to recover.[1]

Apart from short sellers, other market participants, such as institutions have been linked to the role of information and monitoring intermediaries. With regards to institutions in general and their role in monitoring in the capital markets, a great body of the prior literature has defined institutions primarily as institutional investors as described in Chen, Harford, and Li [2007] who offer the monitoring in the capital markets to other participants. In addition, literature has started to focus on governmental institutions and their relation to corporate governance issues and monitoring (e.g., Lederman, Loayza, and Soares [2005], Gilson [1996]), but mainly with a focus on national regulators. After the recent financial crisis, we saw an increase in the need for additional monitors to provide policymakers with regular assessments of the financial system's vulnerabilities and by assisting in information gathering and monitoring.

In the first and second essay, I focus on short sellers to understand, firstly how heterogeneous they are in their investing behavior and their usage of observable, potentially predictive information. The second essay focuses on a subgroup of short sellers who publish reports on target firms thereby disclosing their investment thesis. The essay studies how these

[1] "The Commission will vigorously investigate and prosecute those who manipulate markets with this witch's brew of damaging rumors and short sales," said SEC Chairman Christopher Cox. SEC Charges Wall Street Short seller with Spreading False Rumors (April 24, 2008), available at https://www.sec.gov/news/press/2008/2008-64.htm

activist short sellers may trigger firms' reactions to their disclosed reports. The third essay shifts focus to a newly installed supranational monitor in the European Union, the so-called Monitoring Trustees (MT), where the focus is shifted away from market participants to monitors that are introduced by the European Commission, the supranational executive body of the European Union (EU), to supervise firms. All three essays are empirical in nature and aim at gaining insight into the mechanisms in place in the capital markets, that may or may not, facilitate the monitoring and information production services that help mitigate the various agency problems of the firms. All essays benefit from exploiting interesting settings with data sources of sufficient level of detail that also benefited from hand-collecting data and thereby adding granularity to the existing academic studies. As a result, settings range from single countries, like the United States (US) in the second essay, to a broader set of countries in the first and third essay. These essays aim not to answer whether a particular intermediary, investor, or governmental institution fulfills the monitoring position in a better way.

In the first essay, I investigate observable characteristics and attributes of target firms that different types of short seller choose in a large, international sample. To my knowledge, this study is the first exploratory study that provides descriptive evidence in line with the idea that short sellers are not a homogenous group of investors but rather consist of heterogeneous subsets of investors with different preferences for targets and agendas, including the different use of predictive information. By classifying short sellers into different types, this study fills an open gap in the literature (Jiang, Habib, and Hasan [2020]) by putting a structure on this heterogeneous group of investors. I make use of the data made available through the EU Regulation on short selling that has detailed information about each single short selling transaction including the short sellers' identity, location, and the target firms. With this data, it is possible to differentiate between heterogenous types of short sellers which I group mainly into three groups, namely hedge funds, investment managers, and banks. The data allows to structure short sellers who have mostly been described as a homogenous group of investors in prior literature (e.g., Dechow, Ge, and Schrand [2010]).

Moreover, the decision process of short sellers, which is difficult to observe, has only been scantily addressed in a handful of studies (e.g., Dechow et al. [2001]) and, hence, I examine in this paper which observable firm characteristics of target firms are used by these different types of short sellers to identify overvalued firms. This may help to better understand the role of short sellers as information intermediaries because we may better understand the information set that is deployed by short sellers, especially when there seems to be evidence that different types of short sellers seem to have different revealed preferences as findings of

this study show: Hedge funds and investment managers on average share the preference for larger and younger with investment managers focusing also on lower return on assets and lower book-to-market ratios of target firms. The outcome of being targeted by banks, instead, is significantly only associated with lower restatements but higher leverage on average. Also, hedge funds and investment managers seem to prefer less risky firms abroad, which is in line with long investors who avoid more risky foreign firms due to information asymmetries (e.g., Coval and Moskovitz [1999]).

The second essay studies a subset of short sellers, so-called activist short sellers that publish reports claiming the target firms are overvalued, and the types of responses firms make in response to these short seller reports. It is important to understand the target firm responses to activist short seller reports because these reports have become increasingly prominent in recent years and they significantly impact targeted firms (e.g., Ljungqvist and Qian [2016], Jiang et al. [2020]). Also, this study links back to point of better understanding whether and when short sellers can serve as information intermediaries for other investors and other participants in the capital markets, as those reports represent a negative information event for the target firm, like a sell recommendation of equity research analysts. What makes this setting particularly interesting is that we can see an observable investment thesis by the short seller. This disclosed report may help other market participants to adjust and/or confirm their own beliefs, and thereby short sellers may not only follow their profit-making agenda but also function as information and monitoring intermediaries in the capital markets. The recent collapse of Wirecard AG has shown even more how crucial activist short sellers may be. In 2016, some activist short sellers had already posted a report that contained valuable information regarding the fraudulent activities of the firm but that was neglected, even downplayed, by regulators, equity research analysts, and other market participants.

Using a hand-collected sample of reports that target US-listed firms and collecting the matching responses, this study offers new evidence about the association of those reports with significant firm outcomes. 31% of firms in the sample respond by denying the activists' claims, threatening, or launching lawsuits against the activist, providing additional disclosures, and launching internal investigations. Firms are also more likely to respond when the activist report is accompanied by more negative abnormal returns and when the report contains new information that was not already available in public disclosures. Not only do the results highlight the impact of these short sellers on target firms, but additionally that launching an internal investigation as a response is an important action, as firms electing this option are more

likely to be delisted, more likely to receive a fraud enforcement action, and less likely to be acquired.

The third essay shifts focus away from short sellers in their role as information and monitoring intermediaries to a supranational monitoring mechanism, namely monitoring trustees (MT) that has been deployed to some banks that have obtained state aid during the last financial crisis. Using a hand-collected sample of 76 banks that have received state aid in the EU, I am the first one to study what duties they have and how those supranational monitors may change bank reporting behavior. Whereas some academics (e.g., Gerhardt and Vennet [2017]) have been silent about the role of supranational regulators and monitors during the financial crises at state aid banks, my findings suggest that MT may change in loan loss reporting and restatements through their power to curtail management's discretion and through imposing further supervision. My findings present the first comprehensive economic analysis to study the potential impact on banks through these new supranational monitors. Prior literature mainly investigated how national bank supervisors and regulators have shaped the financial reporting properties of banking systems (e.g., Bushman and Williams [2012], Costello, Granja, and Weber [2019]). By focusing on supranational supervisors, this paper shifts focus away from national supervisors and regulators and contributes to the literature by studying these new supranational monitors.

Since the last financial crisis, external stakeholders have been seeking additional governance mechanisms to encourage bank managers to establish adequate reserves, thus leading to a more stable and healthier banking system. In this regard, the findings of this essay should be of interest to regulators, researchers, and, most importantly, the policymakers at the EC, as my findings contribute to the lively debate on the extent to which additional monitoring mechanisms should be implemented to foster financial stability or to which extend assigning these supervisors should become the norm.

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How do Different Short Sellers Select their Target Firms?

Janja Brendel
Humboldt-Universität zu Berlin

Abstract

I investigate observable characteristics and attributes of firms that different short seller types pick when they select their target firms in a large, international sample. I provide new descriptive evidence using data made available through the EU Regulation on short selling that has detailed information about the short sellers' identity, location, and the target firms. With this dataset, it is possible to differentiate between heterogeneous types of short sellers (e.g., hedge funds, banks) and to observe their revealed target preferences. I find that hedge funds and investment managers on average share preferences for larger and younger firms with investment managers being also associated with a lower return on assets and lower book-to-market ratios. Target firms of banks, instead, are significantly associated with lower restatements but with higher leverage on average. Based on a subsample analysis, short sellers prefer firms with different observable characteristics at home versus abroad, with hedge funds and investment managers, seeming to favor less risky firms abroad.

JEL Codes: *G10, G14, G11*

Keywords: *Short Sellers, Heterogeneous Investors, Hedge Funds, International Financial Markets*

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1. Introduction

How do short sellers identify the companies they invest in? Most of the time, prior literature describes target firms as being overvalued in comparison to firms that are not shorted (e.g., Dechow, Hutton, Meulbroek, and Sloan [2001], Nagel [2003]) or in comparison to the target firm's estimated intrinsic firm value. Additionally, short selling activities are associated with weak target firm fundamentals, such as a low book-to-market ratio, (e.g., Dechow et al. [2001]) or low future returns (e.g., Seneca [1967], Boehme, Danielsen, and Sorescu [2006], Desai, Krishnamurthy, and Venkataraman [2006]). However, the empirical evidence is still relatively meager on how short sellers identify their target firms – besides a few studies (e.g., Desai et al. [2006]) that ask whether accounting information plays a role as an input in short sellers' analyses – and on which firm characteristics they prefer and whether different short sellers share similar preferences or not. Hence, this paper addresses this gap in the literature by exploring additional observable characteristics and attributes that short sellers reveal when they select potentially overvalued target firms by using a sample of short selling transactions across European countries from 2013 to 2015 with 413 target firms. Moreover, the paper provides new, topical descriptive evidence on the revealed preferences of different types of short sellers which directly addresses the recent call made by scholars for more research on "the heterogeneities of short sellers" (Jiang, Habib, and Hasan [2020], p.44).

Generally, short sellers are often described as the relatively more informed market participants compared to other investors (e.g., Drake, Myers, Scholz, and Sharp [2015], Diamond and Verrecchia [1987], and Reed [2013]) and they are seen as important market participants that help to improve market efficiency (e.g., Boehmer, Jones, and Zhang [2008], Diether, Lee, and Werner [2009], and Fang, Huang, and Karpoff [2016]). However, critics say that some short sellers also engage in over-selling activities and that some short sellers may make prices less efficient or may be exposed to limited cognitive processing abilities (e.g., Henry and Koski [2010], and Sun and Xu [2018]). Apart from knowing more about activist short sellers and their observed target preferences through recent studies (e.g., Chen [2016], and Ljungqvist and Qian [2016]), we still know little about how the bigger remaining subset of short sellers identifies target firms. Do all short sellers share similar revealed preferences regarding a target firm's characteristics?

Since the decision process of short sellers has only been scantily addressed in a handful of studies (e.g., Dechow et al. [2001]), I examine in this paper which observable target firm

characteristics are used by short sellers and to what extent these characteristics vary across different types of short sellers, such as banks or hedge funds. By using a more granular dataset which was obtained from each of the national competent authorities in the European Union, I can observe individual short selling transactions including the respective short seller as well as the target firm.[1] The data structure has several advantages. First, the structure of the dataset used in this study allows me to allocate the short sellers to different groups, such as banks, investment managers, or hedge funds because I can identify the short sellers at the institutional level (like Bushee and Noe [2000]) (see Appendix for details). Hence, the data allows me to put more structure on short sellers who have mostly been described as a faceless, homogenous group of investors in prior literature (e.g., Boehmer and Wu [2013], Dechow, Ge, and Schrand [2010]). The location of each short seller is also observable which helps to categorize the short sellers into different groups based on the country of origin which is used in the subsample analyses. Second, due to the more granular data, I can now observe every single transaction made by a short seller at the institutional level (see figure 1) on a one-to-one level. This means that a specific short seller can be paired with its target firm and target firms are identified via the name and the provided International Securities Identification Number (ISIN) for each transaction. Hence, the one-on-one relation between a short seller and target firm allows me to investigate the revealed target preference in greater detail. This has not been possible with data in prior studies in the United States where short interest is disclosed but aggregated across different investors. Hence, prior evidence has provided rather inconclusive results about how short sellers seek out their targets due to highly aggregated data on short interest (e.g., Desai et al. [2006]) or daily data that has severe limitations due to a particular provider (e.g., Daske, Richardson, and Tuna [2005]).

The main findings suggest after controlling for year- and firm-fixed effects in the ordinary least squares regression specification for the short panel (2013-2015) that the outcome of being targeted is positively associated with larger firms as well as younger firms that are often riskier compared to more mature firms. Considering the different subgroups of short sellers, hedge funds seem to prefer larger and younger firms like investment managers. The focus on size seems consistent with the preference for easy to short, more liquid firms (Reed [2013]). Investment managers also seem to account for a lower return on assets ratio and a

[1] Due to a regulatory change on the level of the European Union (EU) regarding the disclosure of short selling trades above a threshold of 0.5%, short sellers must disclose their transactions to the national regulator in the country in which they engage in short selling transactions. Information on the national competent authorities and their dataset have been obtained from the following link https://www.esma.europa.eu/sites/default/files/library/ssr_websites_ss_positions.pdf (access date: 08.12.2017)

lower book-to-market ratio. In contrast, banks prefer leveraged firms and fewer restatements. Looking at differences between how short sellers invest at home versus abroad, I observe that short sellers at home (tested for the UK investors only[2]) reveal differences in target preferences of firms at home compared to target firms abroad: Hedge funds and investment managers prefer target firms abroad that appear to be less risky, which is in line with findings regarding long investors (e.g., Coval and Moskovitz [1999]) that are explained by higher information asymmetries abroad.

This study contributes, firstly, to the literature on short sellers (e.g., Boehmer and Wu [2013], Christophe, Ferri, and Angel [2004], Desai et al. [2006], Drake, Rees, and Swanson [2011], Efendi, Kinney, and Swanson [2005], Engelberg, Reed, and Ringgenberg [2012], Fang et al. [2016], Jones, Reed, and Waller [2016], Reed [2013], and Von Beschwitz, Chuprinin, and Massa [2017]) by adding new descriptive evidence regarding the determinants of the target selection of different short sellers across a large sample of firms in different countries. Secondly, it also contributes to our understanding of the short selling activities of different short seller types and their revealed preferences, thus providing a deeper understanding of this group of investors (e.g., Jiang et al. [2020], Bushee [2001], and Bushee [2004]), which addresses a recently voiced need to conduct more research on these heterogeneous investors (Jiang et al. [2020]). This way, it also connects to the literature (e.g., Bushee [2001], and Bushee [2004]) that has asked whether there are significant differences among investors in trading practices and what kinds of firms tend to attract each type of investors (e.g., Bushee [2001], and Bushee [2004]) but here, the primary focus is on short sellers.

[2] The subsample analyses are conducted only for the UK because it is the country in the sample with highest number of target firms covered and a country that has a large pool of different short sellers.

2. Background and Related Literature

Short selling is a trading strategy that aims to benefit from a decline of a stock price or of another asset price and can be used to speculate or to hedge against downside risks of long positions. Given that short selling often involves leveraged positions, margin calls, and substantial downside risks for the short seller, short selling is distinct from other types of trades and hence, plays a unique and important role in financial markets.

Given its importance, the last decades have produced widespread public and academic interest in short selling activities and interest in its potential consequences for market participants. So far, the existing literature has suggested that the underlying fundamentals of the different target firms seem to make up most of the motivation for short selling (e.g., Dechow et al. [2001]). Short sellers seem to prefer target firms that underperform (e.g., Asquith and Meulbrook [1995], Desai et al. [2002], and Dechow et al. [2001]) which suggests that short sellers use valuation-related signals to identify overpriced firms. Richardson [2003] further investigates whether short selling transactions are linked to the target firms' magnitude of accruals (based on Sloan [1996]) and finds no significant relation between short interest and accruals. Nevertheless, it is not obvious how short sellers distinguish between target firms and non-target firms: Prior literature has been rather silent on providing a better understanding of the underlying determinants that short sellers select and which observable firm characteristics short sellers reveal as preferred firm characteristics.

Much of the prior literature has concentrated on the presence of short sellers around specific corporate events (e.g., Christophe et al. [2004], and Boehme et al. [2006]) that finds that short selling transactions concentrate prior to disappointing earnings announcements, equity analyst forecast revisions, and equity analysts' downgrades. Other studies (e.g., Desai et al. [2006], and Efendi et al. [2005]) show that short interest increases in the months just prior to an earnings restatement or disclosures that correct prior disclosures, suggesting that short sellers select firms that are more likely to be related to doubtful financial reporting practices. However, the ambiguity about short sellers' information set remains and the ambiguity about the preferred targets' characteristics, too. For example, Engelberg et al. [2012] find no evidence that short sellers engage in abnormal trading activities prior to bad news events. Interestingly, Drake et al. [2015] find that short sellers prefer to target rather smaller companies with potentially weaker information environments, which goes against the intuition that target firms are rather large to provide short sellers with enough liquidity needed to conduct a short selling

transaction. Their results also suggest that short sellers respond to, but do not anticipate, restatement announcements of target firms (Drake et al. [2015]).

Recent work on short selling has focused on a special subset of investors, namely activist short sellers (Chen [2016], and Ljungqvist and Qian [2016]) who publicly reveal their information, usually in the form of publicly available reports, to induce a sale of the targets' shares. Chen [2016] finds that this special subset of short sellers focuses on firms with financial reporting red flags but with "good" operating performances and stock valuations. The word "good" implies an operating performance that is deemed to be too good to be true by the reports of short sellers. However, given the specific business model of those short sellers, their own legal risk, i.e., being sued by the companies they target, these short sellers could be incentivized to focus on a special subset of companies.[3] Also, these short sellers seem to make up only a small portion of the overall population of short sellers who do not disclose their investment, making the generalization of these results difficult.

Given that researchers have provided persuasive evidence that institutional investors are not a homogeneous group – they differ greatly in terms of investment styles (value stocks vs. growth stocks), trading frequency, competitive pressures, and legal restrictions (e.g., Bushee [2004]), it may follow that different groups of short sellers also differ in their target firm selection. Using the currently available more granular data set on different short seller types, I can help to better differentiate determinants in the target selection of this heterogeneous group of short sellers and contribute to the literature (e.g., Jiang et al. [2020], Bushee [2001], and Bushee [2004]) in the main part of this paper that tries to examine whether there are significant differences among short sellers in trading practices.

In addition, in a subsample analysis, I examine whether short sellers select their targets differently abroad than at home to see whether the "home bias" behavior is also observable among short sellers. Here, I also investigate whether I see differences for the main subgroups of short sellers. As indicated in prior literature (e.g., Ahearne, Griever, and Warnock [2004]),

[3] In line with Lamont (2012), who provides evidence of firms use lawsuits to block short selling activities, Carson Block, the founder of Muddy Waters Research, mentions: "Every time I publish a report, I assume two things. One is that the company is going to sue me, and I am going to face a hostile regulator. I have only been sued twice. I have never had to file a response. But I assume that I will be sued. And I have never faced a regulator that is hostile. But when I say hostile there are political forces behind the scenes pushing them to come down on us. So, every word that I write in the report must be written to that standard of, "Can I support this in court?", "Can I support this in front of a regulator?" We always know more than we publish." This article discusses what short sellers look for in stocks their short. Link via https://moneyweek.com/495473/what-a-short-seller-looks-for-in-a-stock-and-what-to-short-now/ (access date: 12.12.2019 09:50 pm)

outside long investors face higher informational barriers and, hence, higher information costs concerning foreign firms. When compared to their investments abroad, we know that long investors show a strong preference for more risky firms at home (Coval and Maskowitz [1999]). For short sellers we do not know whether the same holds, yet.

Overall, the paper aims to relate to prior studies that analyze short sellers (e.g., Von Beschwitz et al. [2017], Boehmer et al. [2013], Christophe et al. [2004], Desai et al. [2006], Drake et al. [2011], Efendi et al. [2005], Engelberg et al. [2012], Fang et al. [2016], Jones et al. [2016], and Reed [2013]) in general and their observable target selection procedure (e.g., Dechow et al. [2001], and Drake et al. [2015]) in particular with a focus on the heterogeneity of short sellers (Jiang et al. [2020]) and heterogenous investors (e.g., Bushee [2001], and Bushee [2004]).

3. Data and Research Design

To provide further insights into the process of how short sellers select their targets, I analyze relatively newly available data on short selling transactions, covering a period from November 2012 to July 2016, on short selling activities with regards to target companies across the European Union. The main analysis will only focus on full-year periods, from the beginning of January 2013 to the end of December 2015. The core data sets have been obtained from the respective national regulators where available.[4] Where no short selling was taking place, no data sets were available from the regulator. Due to the new EU regulations, short sellers are asked to disclose their single short selling positions to regulators in the respective country of their target firm. Investors must disclose positions to respective regulators from 0.2% of the net short position, and all positions from 0.5% must be made public since November 2012.

In prior empirical academic literature (e.g., Karpoff and Lou [2010]), the most widely used source of short selling data has included the aggregated short interest of firms in the United States, which consists of a monthly or bimonthly snapshot of open short positions at brokerages. More recent empirical academic papers (e.g., Drake et al. [2015]) have used intra-day data points on short-sale transactions conducted on stock exchanges in the United States. A nice feature of the data that I use is that I can observe each single transaction made by an investor, including the investor's identity, the investor's location, the transaction date, and the publication date as well as the target's identity (see figure 1). Using these disclosed data points, I can classify the short sellers into different groups and determine what kinds of firms are more likely to attract each of the different types of short sellers. Across 16 European Union countries with the available disclosures (see table D), 806 target firms were identified, as well as 383 short sellers (see table 1) and a total of underlying 47,019 transactions. 413 unique target firms remain for the regression specifications in table 5.

I begin the sample selection by obtaining the lists of transactions from the respective national regulators that include all transactions starting with the period November 2012. The main sample will only include the full years 2013-2015 due to data availability at the time data was collected and to circumvent later macroeconomic risks related to the announced Brexit in June 2016. I use the names of each firm and its ISIN to be able to link it to company-specific CapitalIQ financial data and the respective CapitalIQ universe of listed firms in each of the countries. Table 1 describes my sample selection procedure in greater detail. Company-specific

[4] Information on the national competent authorities have been obtained from the following link: https://www.esma.europa.eu/sites/default/files/library/ssr_websites_ss_positions.pdf (access date: 08.12.2017)

data used in the analyses have been retrieved from CapitalIQ and SDC Platinum for the M&A activity data and the variable definitions are described in greater detail in Appendix A.

To classify the short sellers, I have used investor types disclosed with third-party data from CapitalIQ and Bloomberg (see Appendix B, figure B). The classification considers investor types on the institutional level, including hedge funds, banks, investment managers, family offices, pension funds, and others. I choose to use the legal type to classify the short sellers as it is deemed a common approach (Bushee [2004]). The general idea behind this approach is that I assume that, for instance, banks may invest differently than pension funds. The investment practices of both may also differ significantly from those of investment management firms and hedge funds. This approach also entails that each of these types is governed by different fiduciary responsibility laws: banks and pension funds usually must follow stricter fiduciary standards than investment managers and hedge funds, which are less regulated, can follow more complex trading and risk management techniques, and tend to move their portfolios toward safer stocks (Del Guercio [1996]). Also, the competitive pressures faced by each type may differ which may also be reflected in a different target selection approach. Investment managers often tend to have much more "churn", meaning sources flow in and out more often in their funds, than, for instance, pensions and endowments, which results in trading that is more sensitive to the performance of portfolio companies (e.g., Lang and McNichols [1997]). The advantage of my chosen classification approach is that legal type is readily available in most financial databases, too. One of the major disadvantages is that there may exist tremendous variation within these groups in terms of investment horizons and sensitivity to short-term news (Bushee [2005]). However, I deem the parent's legal entity to be important in setting strategies for the overall unit which may not be the case. Also, disclosed investor types may change over time which I cannot capture with my data, and the data may be based on self-disclosed information by investors which may be erroneous. This is probably the biggest limitation of this study because the key dependent variable is constructed based upon the constructed short seller types. Any systematic error in the grouping may harm the results in the main analysis.

Determining the geographical classification of investor types has turned out to be less difficult as the location of investors at the city level can be easily obtained from the disclosures provided (figure 1). In the data set, a short seller's parent's company location is important to identify the distribution of short sellers across countries. For example, a British subsidiary of investors located in the United States is regarded as being an investor located in the United

States. For example, J.P. Morgan's UK subsidy is summarized under the parent's country of origin, here the United States.

The primary model will be fitted by an ordinary least squares' regression specification including year- and firm-fixed effects with standard errors clustered by firm. The dependent variable at firm-year level is equal to either one in the case of being selected as a target by a specific investor group in a given year indicating a positive outcome or zero otherwise.

I estimate the following model at the firm-year level for my ordinary least squares' regression specification with year and firm fixed effects[5]:

$$Target_{i,t} = \beta_0 + \beta_1 Size_{i,t} + \beta_2 Age_{i,t} + \beta_3 Loss_{i,t} + \beta_4 Book\ to\ Market_{i,t} + \\ + \beta_5 RoA_{i,t} + \beta_6 Leverage_{i,t} + \beta_7 Growth_{i,t} + \beta_8 Capital\ intensity_{i,t} + \\ \beta_9 Big4_{i,t} + \beta_{10} Restatements_{i,t} + \beta_{11} Litigation\ risks_{i,t} + \beta_{12} M\&A\ activity_{i,t} + \\ \sum \beta_i Fixed\ effects_i + \sum \beta_t Fixed\ effects_t + \varepsilon_{i,t} \qquad (1)$$

All explanatory variables are included in the model as lagged, winsorized values (at the top and bottom 10%) and measured at the data-year ends (details in Appendix A). First, as an exploratory analysis, I account for basic firm-level characteristics and short sale constraints by including firm size, measured by the log of total assets (*size*) and leverage (*leverage*), measured by the ratio of total liabilities to total assets, expecting that targeted firms have higher leverage as reported in prior literature (e.g., Jank and Smajlbegovic [2017], Massoud, Nandy, Saunders, and Song [2011]). With regards to the size variable, the existing evidence points to two different directions: Jank, Roling, and Smajlbegovic [2021] find that targeted firms are of larger size, which is in line with the short sale constraint argument which states that short sellers prefer larger and more liquid target firms, whereas Drake et al. [2015] find in their sample that short sellers target smaller companies which are said to prefer to operate in weaker information environments. Furthermore, I account for age in the regression specification because I want to explore whether short sellers in a larger sample prefer firms at a certain stage of their life cycles. Recent prior research on activist short sellers finds that this subgroup of short sellers seems to target firms that recently IPOed (e.g., Brendel and Ryans [2021]), i.e., often younger firms. For simplicity reasons, I only consider two firm-age groups: firms that are less than five years old and firms that are five years old or older. I end up with two groups - young and mature firms - by accounting with a binary indicator variable *age* that equals one when a firm is mature and zero otherwise.[6] Additionally, I account for loss-making firms (via a binary *loss* indicator variable), as it is reasonable to assume that firms that are not doing economically well attract

[5] ß$_0$ is not estimated when fixed effects are being used.
[6] Mature is defined as being 5 years old or older (as in Fort, Haltiwanger, Jarmin, and Miranda [2013]).

more short sellers than firms that are not loss-making because short sellers are generally betting that the stock of the firm they short sell will drop in price. As for the overvaluation features, I account for the lagged value of the book-to-market ratio (*book-to-market*), the asset growth (*growth*) (Cooper Cooper, Gulen, and Schill [2008]) which is defined as $Assets_t/Assets_{t-1,}$ and profitability as proxied by the return on assets (*RoA*). With regards to prior expectations, I presume to find targets with a lower book-to-market ratio compared to non-target firms because a lower book-to-market indicates overvaluation. Also, target firms may be likely to be less profitable than non-target firms and may exhibit a lower asset growth relative to non-target firms (e.g., Cooper et al. [2008], Dechow et al. [2001], Jank et al. [2017]). Moreover, I add capital intensity as a potential explanatory variable (*capital intensity*) because, following Kedia and Philippon [2006], there seems to exist a higher likelihood of overvaluation for firms that have a recent history of increased hiring and capital investments. Like Zhao [2018], I account for uncertainty features via the following variables: the existence of Big4 auditors (*Big4)* which is defined as a binary indicator variable counting one for Big4 auditors and zero otherwise, restatements (*restatements*) which indicate whether a firm had recent substantial restatements of their financials or zero otherwise, and the litigation risk (*litigation risk*) as defined by Kim and Skinner [2012]. With regards to the Big4 auditors, I expect target firms to be less transparent than the non-target firms (e.g., Drake et al. [2015]), though considering the risks involved in short selling transactions, one could also argue that short sellers prefer more transparent targets to minimize potential noise trader risk. Lastly, like Beneish and Nicholas [2009], who try to identify overvalued equity, I am adding a variable that tries to capture whether a firm engages in M&As (*M&A activity*). The reasoning behind this variable is that for firms with a recent history of acquisitions, investors may face value destruction via overvalued target firms and a higher uncertainty via a more difficult-to-value firm (e.g., Jensen and Ruback [1983], Travlos [1987], Fuller, Netter, and Stegemoller [2002], and Moeller, Schlingemann, and Stulz [2004]). Some anecdotal evidence supports this variable through a recent example that occurred in February 2021 where a short seller started questioning Kerry Group's acquisition track record and claimed it had overpaid for low-yielding acquisitions.[7] A more detailed description of the variables used in the main specification can be found in Appendix A. I run the main regression analysis in table 5 for all major groups of different short sellers, namely hedge funds, investment managers, and banks. Due to fewer observations, the following

[7] Kerry Group's acquisition track record was question by a short seller in 2021. Link: https://www.irishtimes.com/business/agribusiness-and- food/kerry-shares-slide-as-short-seller-questions-m-a-record-1.4482394 (access date: 10.03.2021)

groups are not analyzed further: pension funds, family offices, and individual investors. The main analysis hence focuses only on the three topmost frequent short seller types.

In an additional analysis, I explore in a subsample analysis whether short sellers, once categorized by their countries of origin, behave differently abroad than at home because one may assume that their information set may vary across countries, and hence, so may their preferences for target firms. Prior literature (e.g., Coval and Moskowitz [1999]) suggests that long investors exhibit a strong preference for locally established firms to take advantage of asymmetric information between local and non-local investors. It also shows that they prefer smaller and more leveraged firms at home, which would be riskier in a setting with lower information asymmetries. For the sub-analysis, I make use of the fact that I, first, have a substantial number of short sellers from the United Kingdom (see table B that describes the UK as the biggest market for hedge funds) in my sample. Second, I have many target firms located in the United Kingdom and abroad that are targeted by short sellers from the United Kingdom (see table C panel B, table D, table 1 panel B). Hence, I use this larger subsample to explore whether short sellers at home in the United Kingdom prefer different target firm characteristics than abroad, expecting to see more target firms with riskier characteristics at home than abroad to be in line with prior literature (Coval and Moskowitz [1999]). The specification follows the same ordinary least squares regressions as in table 5, column (3) where year- and firm-fixed effects are accounted for, and standard errors are clustered by firms only. I also conduct the same analyses for the two largest subgroups, hedge funds, and investment managers, to investigate potential differences across the subgroups.

4. Empirical Results

The sample selection procedure results in 806 target firms and 383 different short sellers with 47,019 transactions (see table 1 for details) in the EU after keeping only transactions of EU firms in the years 2013 to 2015. The main analysis in table 3 to table 6 is based upon 413 target firms that remain after deleting target firms with missing financials and after outlier treatments (e.g., winsorizing at the top and bottom 10%) to minimize the influence of outliers. Out of those 413 firms, the majority of firms are located in the United Kingdom (approximately 33.7%), Germany (approximately 14.8%), France (approximately 9.9%), and Sweden (approximately 9.7%).

According to 47,019 transactions grouped by short seller types in table 2, hedge funds account for the most active group of investors, with a total number of 24,620 transactions (approximately 52% of all transactions), followed by investment managers with 18,087 transactions (approximately 39% of all transactions). Banks make up roughly 8% of all transactions with 3,908 transactions. "Others" is the least active group with a total number of 404 transactions in the period from 2013 to 2015. This group consists of all remaining subgroups such as pension funds, individual investors, etc.; due to the limited number of transactions, these groups are ignored in further analyses. Overall findings are in line with Jank et al. [2021] who find that hedge funds are the largest group, accounting for 66% of their sample and banks only accounting for 2% of the observations. Jank et al. [2021] explain the small visible share of banks with the fact that banks may use an exemption rule for market makers to avoid disclosing their positions because they may face higher reputational costs.[8] Also, my higher percentage share could be explained by a different classification. Unfortunately, I do not observe the classification process of Jank et al. [2021], but I, for example, classified J.P. Morgan Asset Management as a bank and not as an investment manager because it is part of the bank JPMorgan Chase & Co and not a stand-alone investment manager. Additionally, out of the top ten list of short sellers with the most frequent disclosures in table A of the Appendix, only hedge funds, investment managers, and banks are represented which supports my later approach to later focus only on these three core groups in the main analyses. With regards to the origin of the investors in table C in the Appendix, most transactions come from investors located in the United States with 57.8% of the total transactions, followed by short sellers from the United

[8] ESMA publishes a list of market makers (link: https://www.esma.europa.eu/sites/default/files/library/list_of_market_makers_and_primary_dealers.pdf, access date 15.03.2017; this list is frequently updated by ESMA) that are excempted from disclosing their positions.

Kingdom (UK), with 31.7% of all transactions. Among the remaining European Union countries, only France ranks fourth with 1.4% of the 47,019 transactions. Not surprisingly, most transactions from the United States come from hedge funds with 14,607 transactions, followed by investment managers with 10,871 transactions. The United Kingdom is the country with the highest amount of hedge funds and investment managers in Europe as shown in table C panel B. The focus on the United Kingdom in my subsample analyses is also supported by table 1 panel b where the United Kingdom has the most target firms with 139 companies (approximately 33.7% out of the total sample).

Table 3 compares univariate yearly firm-level differences in observable characteristics between target and non-target firms in the universe of listed companies in the respective European Union countries. The data is based on yearly observations of the 413 target firms and 2,041 non-target firms. Generally, target firms are significantly larger (at the 1% significance level) with a log value of Euros 7.81 billion of assets than the average of non-targeted firms with a log value of Euros 6.10 billion assets; comparing medians, target firms are still significantly larger than non-targeted firms (moods test untabulated). This result is in line with target firms being larger, more liquid, and hence easier to short for investors (e.g., Massoud et al. [2011]) than non-targeted firms. In line with prior research (e.g., Jank et al. [2017], and Massoud et al. [2011]), target firms are also significantly more leveraged (at the 1% significance level), implying a riskier firm profile. The book-to-market ratio is also, as expected, lower than the ratio of non-target firms indicating potential overvaluation of the target firms, but the difference remains insignificant. Target firms have on average a significantly higher return on assets and but are not more mature on average, with the age difference being not statistically significant. The finding on the return on assets can be seen as consistent with the finding by Chen [2016] who finds that some short sellers focus on firms that report good operating performances but have red flags related to their financial reports, which he calls as to be “too good to be true” (Chen [2016], p. 1453) firms. Growth and loss indicators are not significantly different between the groups in the univariate comparison. Target firms have significantly more Big4 auditors and a significantly higher capital intensity (both at 1% significance level) than the non-target firms. The higher capital intensity may indicate (Kedia and Philippon [2006]) a higher likelihood of overvaluation for these firms. Another overvaluation feature approximated by M&A activity does not differ from non-target firms on a univariate basis. The only other metric that differs significantly (at the 5% significance level) is the litigation risk where target firms have a lower litigation risk on average. For the different short seller subgroups in panel

B, all subgroups prefer larger target firms with higher leverage, higher capital intensity, and a higher share of Big4 auditors on average in a univariate comparison with non-target firms. Banks seem to additionally prefer older firms, more loss-making firms as well as firms with fewer restatements. Investment managers additionally avoid firms with higher litigation risk but prefer firms with a lower book-to-market ratio. They also prefer firms with a higher return on assets which is similar to hedge funds. Regarding the different industries of target firms, the most frequently targeted industries are the manufacturing and financial services sector (table 3 panel C), which reflects the structure of the overall industry composition of the whole sample of target and non-target firms.

Table 4 provides both the Spearman and Pearson correlation coefficients for all variables included in the regression models as well as the target indicators. The Spearman correlation coefficients that account for non-linearities indicate significantly positive correlations (all at the 1% level) between being an overall target and the variables like size, age, return on assets, leverage, capital intensity, the Big4 auditor indicator variable, and the M&A activity, but the correlation coefficients remain mostly below 0.10 which indicates a rather weak or small association – only size, age, and the Big4 indicator are above 0.10 in the Spearmen specification in column (1). Size, age, return on assets, capital intensity, and the Big4 indicator are significantly positively correlated with being targeted by banks but correlations are still rather weak in terms of the size of the coefficient. Leverage significantly positively correlates for firms that are being targeted by hedge funds and investment managers but again with a rather small correlation coefficient. The book-to-market ratio seems to be only positively correlated with target firms of investment managers but again with a weak association. The M&A activity is only significantly positively correlated with investment managers but again with a weak association regarding the correlation coefficients.

In table 5, the main analyses, I examine the associations between key observable firm characteristics and the outcome of being targeted by different short sellers. Table 5 reports the ordinary least squares specification results from a multivariate regression which accounts for year- and firm-fixed effects as well as clustered robust standard errors. Results in table 5 panel A column (1) suggest that being targeted by all short sellers is positively associated with size, the loss-making indicator, and Big4 indicator but negatively with the book-to-market ratio. After accounting for year- and firm-fixed effects as in column (3), the only two characteristics that remain significant are size and age. Size remains significantly positively associated but age becomes significantly negatively associated with the outcome. This implies that larger firms

and younger firms are more likely to be associated with being a target, which makes sense, as short sellers may prefer more liquid, larger firms to avoid costly short selling constraints (Drake et al. [2011], and Reed [2013]) and to reduce the risk losing their own capital. This finding is also aligning with the suggestion that short sellers are motivated by well-accepted patterns, including size (Reed [2013]). The preference for younger firms is supported by recent findings of activist short sellers that show a preference for recently IPOed firms, hence often younger, firms (Brendel and Ryans [2021]), which is consistent with a preference for riskier firms.

Panel B explores the association between the observable target firms' characteristics and the outcome of being targeted by hedge funds. One can observe that the outcome is positively associated with size and negatively with age in column (3) as in panel A. Similarly, the association between being targeted by an investment manager in panel C and firm size is also positively associated and negatively with age in column (3). Additionally, the outcome is also negatively associated with the return on assets and the book-to-market ratio, indicating that investment managers may prefer firms with lower profitability and signs of overvaluation. In contrast, the outcome of being targeted by a bank, as can be seen in panel D column (3), seems to be primarily positively associated with leverage but negatively with restatements after controlling for year and firm fixed effects. This may indicate that banks use additional predictive information to identify the risk profile of firms; this may also hint at a different information set, given their access to information as capital providers.

In the subsample analyses of the short sellers from the United Kingdom (UK) in table 6 panel A, the biggest non-US group of short sellers in my sample, I explore whether the associations regarding the target firm selection differ at home versus abroad (all other countries combined). In table 6 column (1), one can observe that the association between the outcome of being targeted by UK investors at home is only significantly negatively associated with capital intensity, the overvaluation feature according to Kedia and Philippon [2006]. In column (2), when I account for the UK investors' target selection abroad, only the easy-to-observe loss-making attribute is associated positively with the outcome of being targeted. Litigation risk, however, is negatively associated with the outcome which is in line with the finding by Coval and Moskowitz [1999] where only the investors at home had a strong preference for the riskier local firms. Not only long investors exhibit a preference for less risky foreign firms due to information asymmetries, but short sellers seem to do the same. Results in table 6 panel b support the results from panel a because being targeted by UK hedge funds or UK investment managers abroad is also significantly associated with foreign firms that are less risky because

they have a lower litigation risk. Apart from the litigation risk, UK investment managers also seem to target larger, loss-making firms which is consistent with a less risky short selling strategy. Restatements of firms seem only to matter for UK investment managers at home where they might be more capable to manage existing information asymmetries.

Overall, the results suggest that different short seller types seem to show different revealed preferences that may help them to analyze the fundamental state of a firm and to identify target firms that are expected to realize negative returns in the future.[9] But results also indicate that short sellers cannot be treated by researchers as well as regulators as a homogenous group of investors. Moreover, apart from Dechow et al.'s [2001] findings that short sellers use fundamental-to-valuation ratio, further company indicator variables, such as age, capital intensity or restatements, or litigation risk seem to matter when identifying target firms.

[9] It must be clear that we can only observe revealed preferences and not the actual information used/processed by the short sellers.

5. Conclusion

In this study in general, I am the first to investigate whether different groups of short sellers reveal different preferences for target firms with different observable firm characteristics to better understand this heterogeneous group of investors and their usage of information.

When comparing different types of short sellers, I find significant differences in displayed target firm characteristics that vary across these different short seller types, with hedge funds and investment managers showing revealed preferences for younger but also larger firms. Additionally, investment managers seem to focus on a negative return on assets ratio and lower book-to-market ratios, as fundamental-to-value ratios. Apart from the mentioned attributes, only banks seem to be associated with target firms that have higher leverage and fewer restatements. Across the UK subsample analyses, UK investors seem to exhibit different preferences for foreign and local firms. Especially, hedge funds and investment managers seem to avoid firms abroad that have a higher risk profile which is in line with the behavior of long investors (Coval and Moskowitz [1999]) that avoid riskier foreign firms due to potentially higher information asymmetries.

This study is subject to several important caveats. This study is purely exploratory in nature, and it needs to be clear that this analysis does not claim to document any causal effects. The results are based on the data that may be potentially limited by the reporting errors or biases that may be present in individual short sellers' reports. The regulators' diligence in analyzing the obtained positions, however, provides some assurance as to its integrity. Also, I observe the institutional level of investors only and not the single fund level. Assuming that house policies of these institutions are in place, this might be less of a concern, but this is a strong assumption. One needs to see this study as a complementary exploratory study aiming to fill the current gaps in the existing literature with regards to the activities conducted by short sellers and potential observable determinants of their choice process. Also, due to the threshold upon which the trades are made public, in this case of 0.5%, it is not possible to observe the whole universe of shorted firms. Nevertheless, even with only having obtained the truncated sample, the analysis remains in line with prior research (Dechow et al. [2001]) where firms with over 0.5% of outstanding shares were classified as "high short" positions to emphasize on large short positions because they seem more likely to represent a consensus among short sellers that a stock is overpriced. Also, given the findings by Jank et al. [2017], as mentioned briefly above, differences in firm characteristics between targeted firms above and below the average seem

non-existent, and hence the subset of firms observed above the threshold of 0.5% can be deemed to be representative for the overall population of targeted firms. Lastly, the categorization of investors is based on the investors' own disclosures and a comparison with the investors' descriptions delivered at CapitalIQ. The characterization of types may not be stable over time and the self-declaration may not always be true, which may lead to a wrong classification of short seller types. The chosen approach leaves room for future research to find more elaborate ways to categorize short sellers with data of large amounts of transactions into different groups.

Altogether, this paper contributes to the existing literature in the following way: This paper contributes to the literature on short selling (e.g., Boehmer et al. [2013], Christophe et al. [2004], Desai et al. [2006], Drake et al. [2011], Efendi et al. [2005], Engelberg et al. [2012], Fang et al. [2016], Jones et al. [2016], Reed [2013], and Von Beschwitz et al. [2017]) by expanding our understanding of different short sellers types and their revealed preferences with regards to their observable target selection and target selection procedure. Research on short sellers' use of information, in general, has been limited (Drake et al. [2011]), apart from Dechow et al. [2001]. Hence, this paper studies the connection of the observable short sellers' preferences, the short sellers' use of information, and the target firm characteristics to these different heterogeneous subgroups of short sellers (Jiang et al. [2020]). This study is the first study, to my knowledge, that provides topical evidence in line with the idea that short sellers are not a homogenous group but rather consist of heterogeneous subsets of investors with different preferences for targets, different information sets, and agendas. It is the first paper that classifies these heterogenous short sellers in a large, international sample into different groups to study them in greater detail, and thereby, it directly answers the latest call by Jiang et al. [2020] to provide more insights into this heterogeneous group of investors.

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Appendix

Appendix A: Variable Definitions

Variable	*Definition and Source*
Dependent Variables	
Target	Indicator variable, equal to one when the target firm is targeted by a particular short seller type in a given year, e.g., hedge funds and zero otherwise; when a target firm is only shorted by banks and hedge funds in a given year, both short seller groups are assigned a one for the indicator variable and zero otherwise. *For example, if for a specific target firm, hedge funds account for 350 transactions after the adjustment, investment managers for 200 transactions, and banks for 0 transactions, the first two short seller groups are assigned a one and the last group is assigned a zero. Data source: National regulators.*
Targeted by Hedge Funds	Indicator variable, equal to one when the target firm is targeted by a hedge fund in a given year, e.g., hedge funds and zero otherwise. *Data source: National regulators; CapitalIQ, Bloomberg and Company Information*
Targeted by Investment Managers	Indicator variable, equal to one when the target firm is targeted by an investment manager in a given year, e.g., hedge funds and zero otherwise. *Data source: National regulators; CapitalIQ, Bloomberg and Company Information*
Targeted by Banks	Indicator variable, equal to one when the target firm is targeted by a bank in a given year, e.g., hedge funds and zero otherwise. *Data source: National regulators; CapitalIQ, Bloomberg and Company Information*
Explanatory Variables	
Size	The lagged value of the log of total assets at the fiscal end of the data year; for this position, the following CapitalIQ ticker was used: IQ_TOTAL_ASSETS (e.g., Zhao [2018]); the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
Age	The lagged value is the number of years since foundation; for this position, the following CapitalIQ ticker was used: IQ_YEAR_FOUNDED and the difference calculated between the year founded and the observation years (2013-2015). Then a binary indicator was assigned as a 1 for firms five years old or older and zero otherwise; the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
Loss	The lagged value is an indicator variable of 1 if the net profit of the previous year was negative and zero otherwise. The net profit was pulled from CapitalIQ via IQ_NI; the variable was winsorized at the

	top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
Book-to-Market	The lagged value of the book value per share was obtained via IQ_BV_SHARE; generally high book-to-market stocks earn significant positive excess returns while low book-to-market stocks earn significant negative excess returns (implying overvaluation); the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
RoA	The lagged value is based on the following CapitalIQ ticker: IQ_RETURN_ASSETS; the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
Leverage	The lagged value of the ratio of total liabilities to total assets at the fiscal end of the data year (total liabilities / total assets); for the positions the following CapitalIQ tickers were used: IQ_TOTAL_ASSETS and IQ_TOTAL_DEBT (e.g., Brav, Jiang, Partnoy, and Thomas [2008]; Massa, Zhang and Zhang [2015]; Zhao [2018]); the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
Growth	The lagged value of the yearly asset growth is defined as $Assets_t/Assets_{t-1}$ (in %) (e.g., Zhao [2018]). The logged value has been used and the CapitalIQ variable: IQ_TOTAL_ASSETS; the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
Capital intensity	The lagged value of PPE / total assets ratio based on the following CapitalIQ variables, IQ_NPPE, and IQ_TOTAL_ASSETS; the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
Big4	The lagged value of the indicator variable, equal to one when the auditor in the data year is among the Big-4 auditors and zero otherwise (Zhao [2018]); IQ_AUDIOR_NAME in CapitalIQ was used to identify the auditor for each respective firm; the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
Restatements	The lagged value of the indicator variable, equal to one when the company had restatements that were fundamentally different (RS output under CapitalIQ) from original, i.e., Net Income, Retained Earnings or Cash from Operations is different and zero otherwise, CapitalIQ provided the data via IQ_RESTATEMENT_IS, IQ_RESTATEMENT_IS and IQ_RESTATEMENT_CF; the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
Litigation risk	The lagged value of the indicator, equal to 1 when primary SIC-codes is in the set (2833:2836, 3570:3577, 3600:3647, 5200:5961, 7370:7374, 8731:8734) as in Kim and Skinner [2012]; data was

	obtained via CapitalIQ: IQ_SIC; the variable was winsorized at the top and bottom 10% of the distribution to reduce the effect of outliers. *Data source: CapitalIQ*
M&A activity	The lagged value of the indicator variable, equal to one when the number of all M&A transaction conducted by a firm in each year exceed the yearly median value and zero otherwise (e.g., Hoitash, Hoitash, and Bedard [2009]; Ogneva Subramanyam, and Raghunandan [2007]). *Data source: SDC Platinum*

Appendix B: Additional Background Information

Table A: Short Seller Composition – Top 10 Short Sellers with the Highest Number of Disclosures

This table shows the top 10 short sellers based on the 47,019 transactions in the European Union, including the country of origin, investor type, and average net short position across the sample period of 2013-2015. An example of how the investor type was identified can be found in Appendix figure B.

Overview of Position Holders in the European Union						
#	Position Holder	Investor Type	Country	# Disclosures	*% of Total*	*Average NSP*
1	Blackrock Inc.	Investment Manager	US	6,038	*12.8%*	*0.82*
2	Marshall Wace LLP	Hedge Fund	UK	4,464	*9.5%*	*0.84*
3	AKO Capital LLP	Hedge Fund	UK	2,192	*4.7%*	*1.20*
4	J.P. Morgan Chase & Co.	Bank	US	1,618	*3.4%*	*0.85*
5	Pennant Capital Management LLC	Hedge Fund	US	1,480	*3.1%*	*0.96*
6	Perceptive Advisors LLC	Hedge Fund	US	1,257	*2.7%*	*2.78*
7	Citadel Advisors LLC	Hedge Fund	US	1,147	*2.4%*	*1.08*
8	BNP Paribas S.A.	Bank	FR	1,103	*2.3%*	*0.96*
9	Millennium International Management LP	Investment Manager	US	1,040	*2.2%*	*0.74*
10	Worldquant LLC	Hedge Fund	US	976	*2.1%*	*0.89*

Appendix C: Tables

Table B: Hedge Fund Industry by Location

This table shows the breakdown of hedge fund manager assets under management by location and aims to highlight the importance of the UK for the subsample analysis in table 6. According to the 2015 Preqin Global Hedge Fund Report (link:https://docs.preqin.com/samples/2015-Preqin-Global-Hedge-Fund-Report-Sample-Pages.pdf, access data 22.04.2021), hedge fund managers managed over $2tn in assets in 2015 in the United States (US) and the US accounts for 71% of all industry assets held worldwide. The United Kingdom (UK) ranked second with assets at $413bn and it accounted for 14% of total industry assets worldwide. Hong Kong, Australia, and Singapore are the three largest locations in the Asia-Pacific region to feature in the top 10 largest countries by assets under management (AUM). According to the Preqin Special Report (Hedge Funds in Europe published in 2017): Europe is the second-largest region in terms of hedge fund activity across the globe and $657bn accounts for 20% of AUM held by the industry.

#	Country of Hedge Fund Manager	Assets ($bn)	European Country	# of Hedge Fund Managers	European Country	Assets under Management
1	United States	2,154	United Kingdom	529	United Kingdom	47%
2	United Kingdom	413	Switzerland	123	Switzerland	29%
3	Jersey	62	Sweden	41	France	8%
4	Hong Kong	61	France	66	Italy	4%
5	Brazil	51	Netherlands	27	Sweden	3%
6	Sweden	39	Germany	36	Luxembourg	2%
7	Australia	36	Italy	15	Jersey	2%
8	Canada	31	Luxembourg	35	Netherlands	2%
9	Singapore	29	Spain	16	Other	3%
10	France	25	Norway	10		

Table C: Comparison of Short Sellers – Country Composition

These tables show the origin of the short selling transactions in Panel A and the origin of the different short seller types by country in Panel B. Others in Panel A includes countries Cayman Islands, Sweden, Germany, Isle of Man, Luxembourg, Finland, Australia, Denmark, Japan, Russia, Norway, Brazil, Canada, and Jersey. Others in Panel B includes all other investor types, such as private equity and venture capital firms, family offices, pension funds, arbitrageur, and private investors. The table is based upon the sample that contains 47,019 transactions in total from the observed full years 2013-2015 for the whole European sample.

Panel A: Short Sellers in the European Union by Country of Origin

#	Country	# of Transactions	*Average NSP*	*% of Total*
1	United States	27,185	*1.00*	*57.8%*
2	United Kingdom	14,892	*0.85*	*31.7%*
3	Switzerland	1,784	*0.83*	*3.8%*
4	France	1,384	*1.02*	*2.9%*
5	Hong Kong	665	*0.72*	*1.4%*
6	Bermuda	208	*1.48*	*0.4%*
7	Italy	193	*0.53*	*0.4%*
8	Spain	111	*0.65*	*0.2%*
9	The Netherlands	104	*0.91*	*0.2%*
10	Ireland	102	*0.56*	*0.2%*
11	Others	391	*0.85*	*0.8%*
	Total	47,019		

Panel B: Short Sellers in the European Union by Country and Investor Group

#	Country	Hedge Funds	Investment Managers	Banks	Others
1	United States	14,607	10,871	1,661	46
2	United Kingdom	9,695	5,083	50	64
3	Switzerland	17	919	837	11
4	France	5	96	1,228	55
5	Hong Kong	189	19	0	0
6	Bermuda	0	661	0	4
7	Italy	0	136	52	5
8	Spain	0	0	0	111
9	The Netherlands	28	26	0	50
10	Ireland	0	102	0	0
11	Others	79	174	80	58

Table D: Distribution of Publicly Disclosed Net Short Selling Positions (2013-2015) in the European Union Across Member States

This table displays the distribution of the number of observable transactions across countries that have the NSP disclosures available. The sample contains 47,019 transactions in total from the observed full years 2013-2015 for the whole European sample.

Distribution across Countries		
Country	% of all Transactions	*% of all Firms*
Belgium	53.3%	*3.3%*
United Kingdom	12.2%	*34.9%*
Italy	8.9%	*11.5%*
Sweden	5.9%	*11.1%*
Germany	5.0%	*13.1%*
France	4.9%	*9.4%*
Spain	4.8%	*5.2%*
Finland	1.9%	*3.1%*
Denmark	1.5%	*3.0%*
Austria	0.7%	*1.9%*
The Netherlands	0.4%	*0.6%*
Hungary	0.3%	*0.5%*
Ireland	0.2%	*1.6%*
Luxembourg	0.1%	*0.5%*
Ireland	0.0%	*0.1%*
Greece	0.0%	*0.2%*

Appendix D: Figures

Figure A: Stock Market Capitalization (as % of GDP) in 2013 in each EU28 Country

This table presents the stock market capitalization as % of GDP in 2013 across all 28 countries of the European Union and is directly taken from a report "Capital Markets in the EU" by the European Commission. Link to PDF: CMU_Infographics_A4_printing.pdf (access date: 01.12.2018)

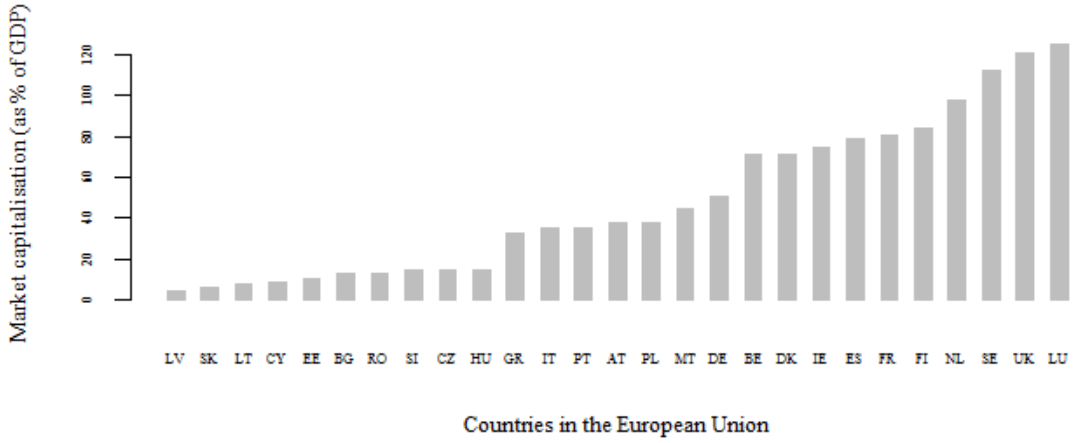
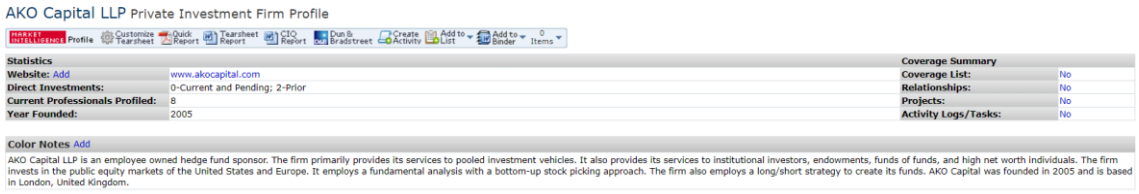


Figure B: Examples of the Investor Identification

These snapshots were taken from CapitalIQ during the data collection period in 2016 to show how short seller types were identified. Apart from CapitalIQ, information from Bloomberg or Company Information was also used.

Example 1: Hedge Fund



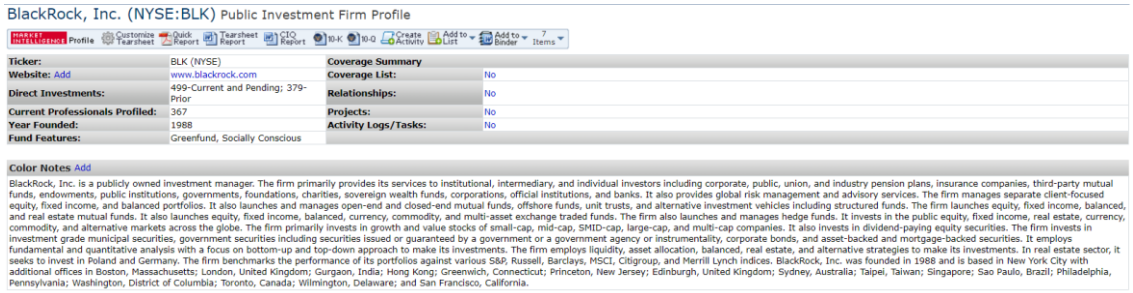
AKO Capital LLP Private Investment Firm Profile

Statistics		Coverage Summary	
Website: Add	www.akocapital.com	Coverage List:	No
Direct Investments:	0-Current and Pending; 2-Prior	Relationships:	No
Current Professionals Profiled:	8	Projects:	No
Year Founded:	2005	Activity Logs/Tasks:	No

Color Notes Add

AKO Capital LLP is an employee owned hedge fund sponsor. The firm primarily provides its services to pooled investment vehicles. It also provides its services to institutional investors, endowments, funds of funds, and high net worth individuals. The firm invests in the public equity markets of the United States and Europe. It employs a fundamental analysis with a bottom-up stock picking approach. The firm also employs a long/short strategy to create its funds. AKO Capital was founded in 2005 and is based in London, United Kingdom.

Example 2: Investment Manager



BlackRock, Inc. (NYSE:BLK) Public Investment Firm Profile

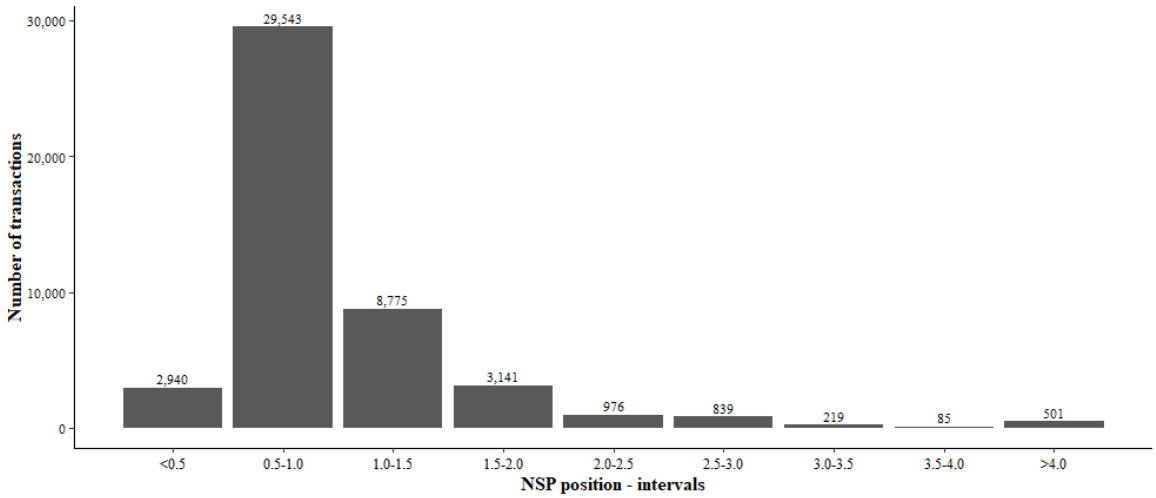
Ticker:	BLK (NYSE)	Coverage Summary	
Website: Add	www.blackrock.com	Coverage List:	No
Direct Investments:	499-Current and Pending; 379-Prior	Relationships:	No
Current Professionals Profiled:	367	Projects:	No
Year Founded:	1988	Activity Logs/Tasks:	No
Fund Features:	Greenfund, Socially Conscious		

Color Notes Add

BlackRock, Inc. is a publicly owned investment manager. The firm primarily provides its services to institutional, intermediary, and individual investors including corporate, public, union, and industry pension plans, insurance companies, third-party mutual funds, endowments, public institutions, governments, foundations, charities, sovereign wealth funds, corporations, official institutions, and banks. It also provides global risk management and advisory services. The firm manages separate client-focused equity, fixed income, and balanced portfolios. It also launches and manages open-end and closed-end mutual funds, offshore funds, unit trusts, and alternative investment vehicles including structured funds. The firm launches equity, fixed income, balanced, and real estate mutual funds. It also launches equity, fixed income, balanced, currency, commodity, and multi-asset exchange traded funds. The firm also launches and manages hedge funds. It invests in the public equity, fixed income, real estate, currency, commodity, and alternative markets across the globe. The firm primarily invests in growth and value stocks of small-cap, mid-cap, SMID-cap, large-cap, and multi-cap companies. It also invests in dividend-paying equity securities. The firm invests in investment grade municipal securities, government securities including securities issued or guaranteed by a government or a government agency or instrumentality, corporate bonds, and asset-backed and mortgage-backed securities. It employs fundamental and quantitative analysis with a focus on bottom-up and top-down approach to make its investments. The firm employs liquidity, asset allocation, balanced, real estate, and alternative strategies to make its investments. In real estate sector, it seeks to invest in Poland and Germany. The firm benchmarks the performance of its portfolios against various S&P, Russell, Barclays, MSCI, Citigroup, and Merrill Lynch indices. BlackRock, Inc. was founded in 1988 and is based in New York City with additional offices in Boston, Massachusetts; London, United Kingdom; Gurgaon, India; Hong Kong; Greenwich, Connecticut; Princeton, New Jersey; Edinburgh, United Kingdom; Sydney, Australia; Taipei, Taiwan; Singapore; Sao Paulo, Brazil; Philadelphia, Pennsylvania; Washington, District of Columbia; Toronto, Canada; Wilmington, Delaware; and San Francisco, California.

Figure C: Distribution of Publicly Disclosed Net Short Selling Positions (2013-2015) in the European Union

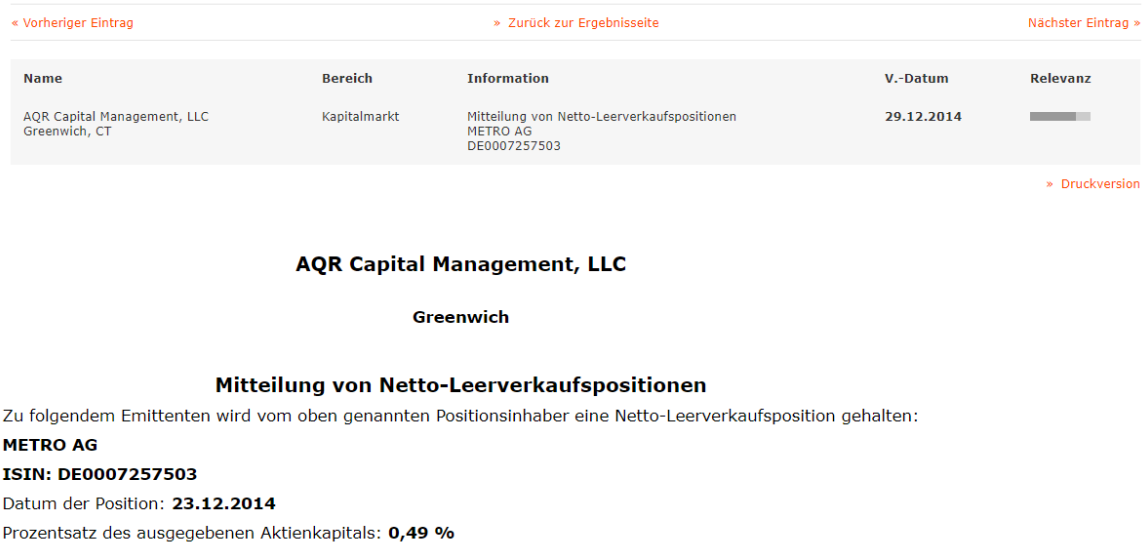
This figure displays the distribution of the number of open short positions across reporting intervals and the relative frequency for each interval with truncation at 0.5%. Reporting intervals are in 0.5 steps, starting from 0.5%. Positions above 0.2% but below 0.5% are reported to the regulator but are not disclosed to the public and hence not visible in this figure. The sample contains 47,019 transactions in total from the observed full years 2013-2015 for the whole European sample. Most transactions locate in the 0.5-1.0 bracket and 1.0-1.5 bracket.



Figures

Figure 1: Example of a Publicly Available Short Selling Disclosure

This figure shows an example of the publicly available disclosures provided by the regulators. It was taken from the German bundesanzeiger.de (access date: 28.09.2017); the data set obtained from the regulator in Germany consists of a similar data structure. All other links to identify the short selling notifications from other European countries were taken from here: https://www.esma.europa.eu/sites/default/files/library/ssr_websites_ss_positions.pdf (access date: 12.03.2017)



« Vorheriger Eintrag » Zurück zur Ergebnisseite Nächster Eintrag »

Name	Bereich	Information	V.-Datum	Relevanz
AQR Capital Management, LLC Greenwich, CT	Kapitalmarkt	Mitteilung von Netto-Leerverkaufspositionen METRO AG DE0007257503	**29.12.2014**	

» Druckversion

AQR Capital Management, LLC

Greenwich

Mitteilung von Netto-Leerverkaufspositionen

Zu folgendem Emittenten wird vom oben genannten Positionsinhaber eine Netto-Leerverkaufsposition gehalten:

METRO AG

ISIN: DE0007257503

Datum der Position: **23.12.2014**

Prozentsatz des ausgegebenen Aktienkapitals: **0,49 %**

Tables

Table 1: Sample Details

Panel A: Sample selection

This table describes the sample selection procedure. Only short selling transactions from 2013 to 2015 are kept in the sample and firms with missing data points in 2012-2015 are also excluded. For identifying the transactions, all countries that have recorded short selling transactions in the respective years are included. The main analyses are based on 413 target firms which are in the European Union. All independent variables are trimmed with the top 10% and bottom 10% of observations being removed in the final sample; additionally, the 2% of firms with abnormally high book-to-market ratios are deleted to arrive at the 413 target firms of the final sample.

Sample Composition – European Union			
Sample Selection Criteria – Target Firms	# of Firms	# of Investors	# of Transactions
Total of Number of Targets	1,224	551	9,075
Less: firms not targeted between 2013-2015	*418*	*168*	*43,056*
Firms in the Targeted Sample	806	383	47,019
Less: firms with not enough firm data available and firms that are deleted due to outlier treatments	*393*	-	-
Targeted Firms in the Final Analyses	413		

Panel B: Country origin of the target firms

This table shows the country of origin of the 413 target firms.

Country	# of Target Firms	*% of Total*
United Kingdom	139	*33.7%*
Germany	61	*14.8%*
France	41	*9.9%*
Sweden	40	*9.7%*
Italy	35	*8.5%*
Spain	26	*6.3%*
Belgium	18	*4.4%*
Denmark	17	*4.1%*
Finland	14	*3.4%*
Austria	10	*2.4%*
Ireland	4	*1.0%*
The Netherlands	4	*1.0%*
Hungary	2	*0.5%*
Luxembourg	2	*0.5%*
Total	413	

Table 2: Short Seller Composition in the European Union

This table shows the distribution of the 47,019 transactions across different short seller types and years 2013-2015 for the whole European sample. Others include pension funds, family offices, and individual investors.

Transactions per Investor Type – European Union				
	N	*2013*	*2014*	*2015*
Hedge Funds	24,620	7,587	8,957	8,076
% of Total	*52.4%*	*56.4%*	*66.6%*	*60.0%*
Average NSP		1.22	1.05	0.93
Investment Managers	18,087	5,017	5,238	7,832
% of Total	*38.5%*	*37.3%*	*38.9%*	*58.2%*
Average NSP		0.84	0.90	0.79
Banks	3,908	643	1,264	2,001
% of Total	*8.3%*	*4.8%*	*9.4%*	*14.9%*
Average NSP		0.77	0.88	0.88
Others	404	203	79	122
% of Total	*0.9%*	*1.5%*	*0.6%*	*0.9%*
Average NSP		1.05	0.72	0.95
Total Transactions	47,019	13,450	15,538	18,031

Table 3: Observable Firm Characteristics of Target Firms (2013-2015)

Panel A: Target firms' comparison with non-target firms

This table reports the summary statistics of the firm characteristics for the target firms and non-target firms in the overall sample of 413 target firms and 2,041 non-target firms in the sample over the years 2013-2015. It divides the sample into firms that are being targeted at least once by any short seller and all other non-targeted firms that have never been targeted in the EU for the period from January 1, 2013 to December 31, 2015, respectively. The sample contains all firms that have data available to calculate the firm characteristics over 2012-2015 as the firm characteristics are based on lagged values. CapitalIQ was used as the source for all financial data points. The table reports time-series averages of cross-sectional means, median, and standard deviation for the targeted and non-targeted firms. For more detailed information regarding the calculations of the firm characteristics and variables used, see Appendix A. All variables are trimmed with the top 10% and bottom 10% of observations being removed. ∗, ∗∗ and ∗∗∗ indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Firms in selected countries in the European Union							
Summary Statistics							
	Target Firms			Non-Target Firms			Difference with Non-Target Firms
Firm Characteristics	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	*Avg. Diff. in Means*
Size	7.813	7.784	1.694	6.084	5.822	2.518	*1.730****
Age	0.991	1.000	0.095	0.985	1.000	0.121	*0.006*
Loss	0.221	0.000	0.415	0.232	0.000	0.422	*-0.010*
Book-to-Market	0.094	0.044	0.130	0.096	0.039	0.146	*-0.002*
RoA	0.037	0.036	0.056	0.026	0.032	0.078	*0.010****
Leverage	0.256	0.246	0.159	0.239	0.212	0.172	*0.018****
Growth	0.041	0.036	0.182	0.040	0.047	0.602	*0.001*
Capital intensity	0.196	0.101	0.226	0.164	0.056	0.230	*0.032****
Big4	0.931	1.000	0.253	0.716	1.000	0.451	*0.216****
Restatements	0.155	0.000	0.362	0.158	0.000	0.365	*-0.003*
Litigation risk	0.018	0.000	0.133	0.028	0.000	0.166	*-0.010**
M&A activity	1.106	0.000	3.283	1.778	0.000	50.170	*-0.671*

Panel B: Comparison of means across different short seller groups with non-target firms

This table reports the univariate differences in means of all firms targeted by each short seller group compared with the non-targeted firms in the sample; all variables are based on lagged values, for more detailed information regarding the calculations of the firm characteristics and variables used, see Appendix A. All variables are trimmed with the top 10% and bottom 10% of observations being removed. ∗, ∗∗ and ∗∗∗ indicate significance at the 10%, 5%, and 1% levels, respectively.

	Firm targeted by		
	Hedge Funds	Investment Managers	Banks
Firm Characteristics	*Differences in Means*	*Differences in Means*	*Differences in Means*
Size	2.255***	1.535***	1.491***
Age	0.001	0.005	0.010*
Loss	0.020	0.001	0.085**
Book-to-Market	0.017**	-0.014**	0.003
RoA	0.007**	0.010***	0.001
Leverage	0.030***	0.015**	0.042***
Growth	-0.005	-0.003	0.006
Capital intensity	0.028**	0.035***	0.067***
Big4	0.245***	0.212***	0.217***
Restatements	-0.025	0.014	-0.049**
Litigation risk	-0.011	-0.011*	-0.007
M&A activity	-0.362	-0.946	-0.803

Panel C: Distribution of target firms according to industries by SIC codes

This table reports the distribution of target firms across different industries in the EU based on the primary sic code focusing on the industry groups for the overall sample of 413 target firms and 2,041 non-target firms in the sample over the years 2013-2015. The industry classification is based on the major two-digit SIC codes.

Industries by SIC code		
Division	Target Firms in %	Non-Target Firms in %
Manufacturing	46.5%	39.1%
Finance, Insurance and Real Estate	13.7%	23.1%
Services	11.8%	16.0%
Wholesale Trade and Retail Trade	10.9%	6.9%
Transportation, Communications, Electric, Gas, and Sanitary Service	9.6%	7.7%
Mining and Construction	7.4%	6.5%
Other	0.0%	0.7%
Agriculture, Forestry and Fishing	0.0%	0.1%

Table 4: Correlation Table of Target Firms Attributes and Characteristics

This table shows the Spearman (lower part) and Pearson (upper part) correlations for the firm attributes based on the sample of N= 6,414 firm-years; numbers in old are indicated statistical significance at the 1% level.

Correlation table																	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16
(1)	Target					**0.225**	**0.080**	-0.008	-0.005	0.044	0.034	0.000	0.045	**0.160**	-0.003	-0.020	-0.005
(2)	Target of Hedge Funds					**0.090**	0.052	0.036	0.004	-0.002	0.041	0.002	0.048	**0.077**	-0.024	-0.007	-0.003
(3)	Target of Investment Managers					**0.198**	0.038	0.012	0.029	0.017	0.039	-0.002	0.026	**0.121**	-0.017	-0.015	-0.001
(4)	Target of Banks					**0.159**	0.057	0.002	-0.029	0.036	0.022	-0.002	0.041	**0.127**	0.012	-0.018	-0.006
(5)	Size	**0.260**	**0.112**	**0.217**	**0.191**		**0.334**	**-0.237**	**0.346**	**0.219**	**0.171**	0.023	**0.157**	**0.441**	**0.092**	**-0.090**	0.040
(6)	Age	**0.106**	**0.074**	**0.070**	**0.080**	**0.409**		**-0.121**	**0.212**	**0.102**	**-0.019**	-0.014	0.031	**0.191**	0.030	**-0.072**	0.010
(7)	Loss	-0.008	0.036	0.012	0.002	**-0.242**	**-0.185**		**-0.132**	**-0.534**	**0.057**	**-0.072**	-0.023	**-0.100**	0.000	0.007	-0.015
(8)	BTM	0.039	0.020	**0.077**	-0.006	**0.517**	**0.339**	**-0.247**		0.054	0.024	0.006	**0.127**	**0.142**	0.044	-0.032	0.038
(9)	RoA	**0.041**	-0.012	-0.003	**0.043**	**0.135**	**0.140**	**-0.593**	**0.108**		-0.012	**0.079**	**0.058**	**0.096**	-0.032	-0.028	0.022
(10)	Leverage	**0.048**	**0.046**	**0.046**	0.036	**0.201**	0.039	**0.046**	0.013	**-0.072**		-0.003	**0.302**	0.050	0.054	**-0.066**	-0.009
(11)	Growth	-0.031	-0.019	-0.036	-0.023	-0.026	**-0.125**	**-0.264**	-0.010	0.291	-0.039		0.003	0.012	0.001	0.013	0.003
(12)	Capital intensity	**0.090**	**0.065**	**0.059**	**0.076**	**0.240**	**0.156**	**-0.037**	**0.182**	**0.088**	**0.242**	**-0.078**		**0.119**	0.026	**-0.067**	-0.015
(13)	Big4	**0.160**	**0.077**	**0.121**	**0.127**	**0.466**	**0.256**	**-0.100**	**0.237**	**0.103**	**0.055**	**-0.053**	**0.189**		-0.009	-0.034	0.015
(14)	Restatements	-0.003	-0.024	-0.017	0.012	**0.086**	0.019	0.000	**0.058**	**-0.062**	**0.054**	**-0.044**	0.012	-0.009		-0.035	-0.008
(15)	Litigation risk	-0.020	-0.007	-0.015	-0.018	**-0.093**	**-0.096**	0.007	**-0.041**	0.000	**-0.068**	0.029	-0.033	-0.034	-0.035		-0.004
(16)	M&A activity	**0.062**	0.019	**0.055**	0.034	**0.187**	**0.044**	**-0.121**	**0.091**	**0.120**	0.015	**0.133**	-0.002	**0.078**	0.006	0.017	

Table 5: Targeted Firms by Different Short Sellers Across all Countries

Panel A: Regression analysis of targeting – All short sellers

This table presents the ordinary least squares specifications with year and firm fixed effect. The binary dependent variable is defined as one when the respective firm in the sample is targeted by any of the short sellers in a given year (2013-2015) and zero otherwise. The results for pension funds, family offices, and others are not tabulated since observations are too few. The definitions of all explanatory variables are given in Appendix A. The models accounted for clustered robust standard errors, clustered by year in column (2) and firms in column (3). ∗, ∗∗ and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Regression Analysis of Targeting – All Short Sellers			
European Union sample			
		OLS	
	(1)	(2)	(3)
DV = Target by Investor Type	*Targeted by*	*Targeted by*	*Targeted by*
Firm Characteristics	All Investors	All Investors	All Investors
Size	0.030***	0.030***	0.048*
Age	0.062*	0.058	-0.049**
Loss	0.042***	0.043***	0.017
Book-to-Market	-0.209***	-0.210***	-0.178
RoA	0.100	0.110	0.002
Leverage	-0.026	-0.027	0.020
Growth	-0.001	-0.002	-0.007
Capital intensity	0.025	0.025	-0.145
Big4	0.053***	0.053***	0.007
Restatements	-0.017	-0.010	0.003
Litigation risk	-0.002	-0.003	-0.005
M&A activity	0.016	0.015	0.004
Year FE	*No*	*Yes*	*Yes*
Firm FE	*No*	*No*	*Yes*
Observations	6,414	6,414	6,414
R^2	0.067	0.069	0.713
Adj. R^2	0.065	0.067	0.566

Panel B: Regression analysis of targeting – Hedge funds

This table presents the ordinary least squares specifications with year and firm fixed effect. The binary dependent variable is defined as one when the respective firm in the sample is targeted by hedge funds in a given year (2013-2015) and zero otherwise. The definitions of all explanatory variables are given in Appendix A. The models accounted for clustered robust standard errors, clustered by year in column (2) and firms in column (3). ∗, ∗∗ and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Regression Analysis of Targeting – Hedge Funds			
European Union sample			
		OLS	
	(1)	(2)	(3)
DV = Target by Investor Type	*Targeted by*	*Targeted by*	*Targeted by*
Firm Characteristics	Hedge Funds	Hedge Funds	Hedge Funds
Size	0.019***	0.019***	0.031**
Age	0.011	0.009	-0.026***
Loss	0.034***	0.034*	0.016
Book-to-Market	-0.064***	-0.065**	-0.147
RoA	-0.001	0.005	0.084
Leverage	0.003	0.003	0.042
Growth	-0.001	-0.001	-0.003
Capital intensity	-0.004	-0.004	-0.047
Big4	0.020***	0.020*	-0.014
Restatements	-0.021***	-0.018	-0.009
Litigation risk	0.002	0.002	-0.002
M&A activity	0.010	0.010	0.013
Year FE	*No*	*Yes*	*Yes*
Firm FE	*No*	*No*	*Yes*
Observations	6,414	6,414	6,414
R^2	0.047	0.049	0.700
Adj. R^2	0.046	0.047	0.546

Panel C: Regression analysis of targeting – Investment managers

This table presents the ordinary least squares specifications with year and firm fixed effect. The binary dependent variable is defined as one when the respective firm in the sample is targeted by investment managers in a given year (2013-2015) and zero otherwise. The results for pension funds, family offices, and others are not tabulated since observations are too few. The definitions of all explanatory variables are given in Appendix A. The models accounted for clustered robust standard errors, clustered by year in column (2) and firms in column (3). ∗, ∗∗ and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Regression Analysis of Targeting – Investment Manager			
European Union sample			
		OLS	
	(1)	(2)	(3)
DV = Target by Investor Type	*Targeted by*	*Targeted by*	*Targeted by*
Firm Characteristics	Investment Manager	Investment Manager	Investment Manager
Size	0.018***	0.018***	0.034**
Age	0.039	0.036*	-0.052**
Loss	0.032***	0.033**	0.014
Book-to-Market	-0.181***	-0.181***	-0.167*
RoA	0.102*	0.108	-0.118*
Leverage	-0.027	-0.027	0.019
Growth	-0.002	-0.002	-0.006
Capital intensity	0.028*	0.028	-0.106
Big4	0.043***	0.042**	0.005
Restatements	0.002	0.005	0.014
Litigation risk	-0.006	-0.007	-0.007
M&A activity	0.004	0.004	-0.003
Year FE	*No*	*Yes*	*Yes*
Firm FE	*No*	*No*	*Yes*
Observations	6,414	6,414	6,414
R^2	0.040	0.042	0.650
Adj. R^2	0.038	0.040	0.471

Panel D: Regression analysis of targeting – Banks

This table presents the ordinary least squares specifications with year and firm fixed effect. The binary dependent variable is defined as one when the respective firm in the sample is targeted by banks in a given year (2013-2015) and zero otherwise. The results for pension funds, family offices, and others are not tabulated since observations are too few. The definitions of all explanatory variables are given in Appendix A. The models accounted for clustered robust standard errors, clustered by year in column (2) and firms in column (3), ∗, ∗∗ and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Regression Analysis of Targeting – Bank			
European Union sample			
		OLS	
	(1)	(2)	(3)
DV = Target by Investor Type	*Targeted by*	*Targeted by*	*Targeted by*
Firm Characteristics	Bank	Bank	Bank
Size	0.006***	0.006	0.010
Age	0.025	0.022*	0.011
Loss	0.025***	0.026*	0.009
Book-to-Market	-0.034**	-0.034	-0.044
RoA	0.015	0.024	-0.083
Leverage	0.014	0.013	0.097**
Growth	0.001	0.001	0.000
Capital intensity	0.023**	0.023	-0.072
Big4	0.016***	0.016*	0.005
Restatements	-0.015**	-0.009	-0.017**
Litigation risk	0.003	0.002	0.005
M&A activity	0.003	0.002	-0.008
Year FE	*No*	*Yes*	*Yes*
Firm FE	*No*	*No*	*Yes*
Observations	6,414	6,414	6,414
R^2	0.017	0.023	0.516
Adj. R^2	0.015	0.021	0.269

Table 6: UK Investors at Home and Abroad

Panel A: All UK investors

This table presents the binary choice model fitted with an ordinary least squares specification. The binary dependent variable is defined as one when the respective firm in the sample is targeted by UK investors at home (1) and abroad (2) in a given year and zero otherwise. The definitions of all explanatory variables are given in Appendix A. The models accounted for clustered robust standard errors, clustered by firms. ∗, ∗∗ and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively. I chose to present the results only for the UK as here the number of observations for investing at home and abroad is big enough. See table C in the Appendix for more details.

Regression Analysis of Targeting – UK Investors		
	OLS	
	(1)	(2)
DV = Target by Investor Type	*Targeted by*	*Targeted by*
Firm Characteristics	UK Investors at Home	UK Investors Abroad
Size	-0.003	0.019
Age	0.004	-0.076
Loss	0.011	0.025**
Book-to-Market	-0.030	-0.055
RoA	0.046	-0.024
Leverage	-0.009	-0.054
Growth	-0.010	-0.001
Capital intensity	-0.315**	0.027
Big4	0.047	0.000
Restatements	0.024	0.003
Litigation risk	-0.016	-0.033**
M&A activity	0.002	0.011
Year FE	*Yes*	*Yes*
Firm FE	*Yes*	*Yes*
Observations	1,816	4,598
R^2	0.497	0.566
Adj. R^2	0.235	0.343

Panel B: UK investors by short seller types

This table presents the binary choice model fitted with an ordinary least squares specification as in panel A with year- and firm-fixed effects. The binary dependent variable is defined as one when the respective firm in the sample is targeted by either a UK located hedge fund or investment manager at home (1), (3) or abroad (2), (4) in a given year, and zero otherwise. UK banks are neglected due to their small number in the sample. The definitions of all explanatory variables are given in Appendix A. The models accounted for clustered robust standard errors, clustered by firms. ∗, ∗∗ and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively. I chose to pick only the UK as here the number of target firms is large, and the UK has a large pool of different short seller types. See table 1 panel B or table C in the Appendix for more details.

Regression Analysis of Targeting – UK Investors				
Short Seller Subgroups				
	OLS			
	(1)	(2)	(3)	(4)
DV = Target by Investor Type	*Targeted by*	*Targeted by*	*Targeted by*	*Targeted by*
Firm Characteristics	UK Hedge Funds at Home	UK Hedge Funds Abroad	UK Investment Managers at Home	UK Investment Managers Abroad
Size	-0.004	0.011	-0.006	0.020*
Age	0.000	-0.072	0.002	-0.043
Loss	0.006	0.015	0.014	0.028***
Book-to-Market	-0.012	-0.042	-0.030	-0.019
RoA	-0.016	-0.005	0.058	-0.017
Leverage	0.023	0.001	-0.014	-0.018
Growth	0.003	-0.001	-0.009	-0.002
Capital intensity	-0.069	0.063	-0.313**	0.009
Big4	-0.020	-0.003	0.046	-0.001
Restatements	0.001	0.005	0.024*	0.008
Litigation risk	-0.001	-0.022**	-0.016	-0.017*
M&A activity	0.012*	0.014*	-0.005	0.001
Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Firm FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	1,816	4,598	1,816	4,598
R^2	0.410	0.580	0.494	0.453
Adj. R^2	0.101	0.365	0.230	0.173

Responding to Activist Short Sellers: Allegations, Firm Responses, and Outcomes

Janja Brendel
Humboldt-Universität zu Berlin

James Ryans
London Business School

Abstract

This study provides descriptive evidence on how firms respond to activist short seller reports and how these responses are associated with outcomes for the targeted firms. We show that the frequency of these reports has grown substantially in recent years. While we find that firms respond only 31% of the time, this rate increases substantially when the report is accompanied by significantly negative abnormal returns and when the report contains new evidence. Not responding is associated with a less negative stock price response at report release and fewer adverse outcomes. Firms that launch internal investigations following the report release have significantly higher subsequent rates of stock exchange delisting and SEC enforcement actions, and lower rates of being acquired. Overall, our results highlight the impact of activist short sellers on target firms and that firm responses are associated with material outcomes.

JEL Codes: *D82, G14, G34, M41, M42, M48*

Keywords: *activist short sellers; internal investigations; fraud; voluntary disclosure; delisting; restatements*

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1. Introduction

We present descriptive evidence of target firms' responses to activist short seller reports. Activist short sellers are hedge funds or individuals who take short positions in a company's stock prior to publishing research reports that claim the target firm is overvalued. Their reports frequently allege accounting issues and fraud, and the reports are accompanied by significant negative abnormal stock returns on average and higher rates of outcomes such as stock exchange delistings and SEC enforcement actions. It is important to understanding target firm responses to activist short seller reports because these reports have become increasingly prominent in recent years and they significantly impact targeted firms (e.g., Ljungqvist and Qian [2016], Jiang, Habib, and Hasan [2020]). Despite the growing importance of activist short sellers, little is known about how firms respond to these reports. We provide new evidence about the types of responses firms make when targeted by activist short sellers and associations among these responses and firm outcomes.

Our analysis proceeds in four steps. First, we collect an extensive sample of activist short seller reports and manually classify their allegations, including the presence of business and accounting issues, if the activist provides new evidence not already available in public filings, and if the activist alleges securities fraud. Our sample includes 351 activist short seller reports released between 1996 and 2018. We find that the number of short seller reports has grown substantially in recent years, from an average of 2.5 reports per year during the period from 1996 to 2009, to 35 reports per year from 2010 to 2018.

Second, we collect and classify all observed firm responses to these reports. The most frequent type of response is a public denial of the activists' claims through a press release or conference call, which we observe in response to 28% of activist reports. Firms can make more than one type of response, and we also observe that firms provide additional information to investors (following 12% of reports), file or threaten to file lawsuits against the short seller (6% of reports), and launch internal investigations conducted by outside counsel (4% of reports). Overall, the firms in our sample respond to 31% of the activist reports using one or more of these approaches.

Our third area of analysis is to provide evidence on factors associated with the decision to respond. We find a strong relationship between the tendency of firms to respond and returns at the release of the short-seller report. Firms that do not respond have insignificant abnormal

returns on average at the report release, but a response becomes more likely when abnormal returns are more negative: only 24% of firms respond when their abnormal returns surrounding report release is in the highest three quartiles, increasing to 52% of firms responding for lowest quartile returns. Firms are also more likely to respond when the reports contain new information not already available in securities filings, a characteristic that Ljungqvist and Qian [2016] use to proxy for report credibility. Management may be better positioned to use the activist's report data to verify or refute the allegations more easily when the activist presents new evidence, compared to when the report is based on opinions based on the company's filings. Consistently, we find that firms are significantly less likely to respond when the activist's report only discusses overvaluation based on business issues and does not provide new evidence.

Our fourth and final area of analysis is whether firms' responses are associated with adverse outcomes, specifically, we consider stock exchange delisting, SEC Auditing and Accounting Enforcement Releases (AAERs), financial statement restatements, auditor changes, and being the target of an acquisition. Firms that launch internal investigations in response to the short seller report release are significantly more likely to be delisted, to receive an AAER, and are less likely to be acquired compared to other target firms which respond in other ways. Taken together, our study finds that firms' responses to activist short seller reports vary systematically with characteristics of the report and are associated with firm outcomes. The majority of firms do not respond to activist short sellers, and not responding is associated with a less negative stock price response to the report release and fewer adverse outcomes. Thus, the initial market response to the report appears to be an effective indicator of a report's merit.

Our results are relevant to several streams of academic research. We contribute to the limited literature on activist short sellers and firm responses to their reports. Lamont [2012] uses media reports of target companies engaging in lawsuits and related actions against short sellers between 1977 and 2002 and finds significantly negative abnormal returns following these media reports. However, Lamont [2012] is limited to firms that responded and were covered in the press, it does not examine factors associated with the decision to respond or outcomes for firms that do not respond. Ljungqvist and Qian [2016] examine a sample of all research reports from a set of activist short sellers, released between 2006 and 2011. They demonstrate that activist short seller reports presenting new information are associated with target company price declines, but they do not consider firm responses. We provide new evidence on target firms' response decisions and the relation with firm outcomes, including more recent time periods when activist short seller reports have become more frequent and

widely available to investors and the media through social media and other report distribution websites.

We also contribute to the literature on the duties of managers and directors to investigate allegations of wrongdoing. The legal literature describes the Delaware Doctrine standard for board members' fiduciary duties (Pan [2010]). Managers and directors must investigate credible red flags for fraud or other criminal activity, usually by means of an internal investigation conducted by outside counsel (e.g., Duggin [2003], Pearson and Mark [2007], Mark and Pearson [2007]). Firms use this structure to maintain the confidentiality of the internal investigation's findings by virtue of attorney-client privilege, giving the firm an option to waive privilege and reveal the information to the public or cooperate with authorities. To our knowledge, there are no extant studies providing empirical evidence on the determinants of internal investigations into fraud allegations or their association with firm outcomes. Our study provides evidence that firms responding to short seller reports by launching internal investigations are associated with higher subsequent rates of AAERs, delisting, are less likely to be acquired.

Finally, we contribute to the literature on accounting fraud, restatements, and related adverse outcomes. Miller [2006] examines AAER firms and finds that the press often reports accounting fraud prior to the firm or SEC revealing the information. Dyck, Morse and Zingales [2010] examine various sources of fraud information, using short interest to infer the involvement of short sellers. We also consider other adverse events that are associated with negative returns upon their announcement, such as restatements (e.g., Palmrose, Richardson, and Scholz [2004]). We extend this literature by giving new evidence about the role of activist short sellers as information intermediaries, firm responses, and adverse outcomes.

2. Background and Conceptual Framework

2.1. Target firm responses to activist short sellers

The term activist short seller refers to hedge funds or individuals who disclose having a short position in a target company's stock. Activists establish a short position in target companies' shares prior to publishing their research reports describing the target firms' overvaluation. Ljungqvist and Qian [2016] provide evidence that these activists, despite having limited capital, are able to precipitate stock price declines with the publication of their research reports, indicating that the reports are on average effective. The activists intend to cover their short positions at a profit after the reports are released and the targets' stock price falls. Theory suggests that activist short sellers will make generally truthful reports, since a track record for accuracy is expected to increase the market response to subsequent reports, increasing the profitability of trading in advance of these reports in a repeated game. Benabou and Laroque [1992] show that the reporters' optimal strategy involves issuing false reports with non-zero probability. Mitts [2020] provides empirical evidence that anonymous short-oriented posting on chat boards contain such distorted reports, which aim to profit from the resulting temporary price declines.

Making false statements in a written research report is risky for short sellers, as it gives rise to potential securities fraud liability under SEC rule 10b-5.[1] Short sellers can also be sued for defamation by target firms (e.g., Lamont [2012], Mitts [2020]). Successful defamation claims require the target firm to prove four elements: that the short seller made a false statement purporting to be fact, communicated that false statement to a third party, that the false statement was negligent or malicious, and that the target firm suffered damages as a result.[2] Firms can sue short sellers for defamation even when the report is accurate, as a bluffing strategy to try and force the short seller to withdraw the report rather than incur the legal costs of defending the action. Short sellers have successfully defended themselves against defamation lawsuits by

[1] "The Commission will vigorously investigate and prosecute those who manipulate markets with this witch's brew of damaging rumors and short sales," said SEC Chairman Christopher Cox. SEC Charges Wall Street Short seller with Spreading False Rumors (April 24, 2008), available at https://www.sec.gov/news/press/2008/2008-64.htm

[2] Overstock.com v. Gradient Analytics, 151 Cal.App.4th 688 (Cal. Ct. App. 2007) is an example of a successful defamation action brought against short sellers.

demonstrating that their analysis was either accurate or an expression of opinion rather than fact.[3]

Overall, the foregoing discussion suggests that activist short sellers are incentivized to provide generally accurate reports, but that some reports will be intentionally distorted. Therefore, firms may be able to influence investors and regulators by undertaking a response that credibly communicates that a report's allegations lack merit. Despite the increase in activist short seller reports in recent years, and evidence that activists have a significant impact on target firms' share price, there is little evidence about when firms respond and whether those responses are informative.

Our study is most closely related to Lamont [2012] which examines returns for a set of firms identified from media articles to have engaged in anti-shorting actions against short sellers, such as lawsuits. However, Lamont [2012] only looks at cases where the target firm's response was reported in the media, and so does not examine the response choice itself. Also, Lamont's [2012] sample is taken from media reports between 1977 and 2002, a period with little overlap with the modern concept of activist short selling, given the significant expansion of internet publishing and social media distribution since 2002. Modern activists are now able to rapidly reach a wide audience and have a significant impact on target firms. Furthermore, Lamont [2012] considers stock returns following the media report, while we look at a range of adverse outcomes including AAERs, delisting, restatements, and being acquired, which represent significant events for targeted firms and its managers (e.g., Dechow et al. [2001], Palmrose, Richardson, and Scholz [2004], Walsh [1989], Clark and Ofek [1994]). We also examine auditor changes as prior literature finds that auditors associated with fraud firms have higher litigation risk (Bonner, Palmrose, and Young [1998]).

The majority of prior research into short sellers has generally been based on indirect evidence of short seller activity, such as aggregate short interest. Heavily shorted firms experience negative abnormal returns indicating that short sellers are effective in identifying overvaluation (e.g., Dechow et al. [2001], Desai et al. [2002], Asquith, Pathak, and Ritter [2005], and Karpoff and Lou [2010]). Some direct evidence on large individual short positions has become available in the European setting, where public disclosure of these positions has

[3] GTX Global Corp. v. Left, 2007 WL 1300065 (Cal. Ct. App. May 4, 2007) is an example of a successful defence mounted by a short seller.

been required since 2012. Jones, Reed, and Waller [2016] show that the initial disclosure of these short positions is followed by negative abnormal returns. However, research based on short interest as well as European evidence on individual short positions does not examine either the short sellers' rationale for shorting the target firms or the firms' responses.

2.2. Internal investigations conducted by outside counsel

Firms are not obligated to respond to activist short seller reports. When credible allegations of fraud and misconduct are presented, the firm's directors have a fiduciary duty to investigate to protect the firm and its shareholders by maintaining oversight of the firms' compliance with laws and regulations. Pan [2010] describes the Delaware Doctrine standard for directors' fiduciary obligations. This standard directly applies to the 58% of listed firms that are incorporated in Delaware, and Bebchuk and Cohen [2003] show that Delaware corporation law strongly influences legislation and case law in other jurisdictions. Under the Delaware Doctrine, directors are only required to investigate potential wrongdoing when clear red flags regarding fraudulent or criminal activity are present. Investigations of business risk issues are not required, except in extreme cases (Pan [2010]).

Directors primarily exercise their fiduciary duty to investigate allegations of fraud and malfeasance by launching an internal investigation conducted by outside counsel. Duggin [2003] notes that the purpose of internal investigations is both to evaluate risk exposure and mitigate legal liability and potential penalties through cooperation with authorities. A key benefit of utilizing outside counsel is to protect the investigation's findings with attorney-client privilege, allowing the firm to avoid having to disclose any resulting findings either to shareholders or to authorities unless the firm elects to waive this privilege. Mark and Pearson [2007] and Pearson and Mark [2007] discuss the framework whereby prosecutors and government agencies encourage companies to cooperate with authorities and reveal the results of internal investigations with sentencing guidelines that favor cooperation. However, Leone, Li, and Liu [2020] provide empirical evidence from SEC enforcement actions that target firm cooperation is associated with higher penalties. This conflicting empirical result could reflect that firms cooperate when they have engaged in more severe misbehavior, or it may reflect that cooperation is not rewarded in practice. The literature does not currently provide empirical evidence about the decision to conduct internal investigations or the relation of investigations to short seller activity and firm outcomes.

2.3. Conceptual framework

The timeline of the moves made by the activist and the target firm is illustrated in figure 1. At time 1, the activist observes a noisy private signal about the target firm's value and issues a report indicating the firm has a low value. There exists an equilibrium that maximizes expected profits for the activist where a fraction of reports is strategically distorted, indicating low value when in fact the activist's private signal indicated high value (Benabou and Laroque [1992]).

At time 2, the market responds to the activist's report with a negative abnormal return if the report presents credible new information. At time 3, the target firm observes the market reaction to the activist's report and its own private signal of firm value. Since there is an expectation that not all reports are accurate, there is scope for the firm to respond to try and persuade investors to discount the activist's report. The motivation to respond arises from the firm's interest in reversing a stock price decline that followed the release of the report. Responding managers may also want to forestall an enforcement investigation that might arise from the report's allegations. The SEC performs a cost-benefit analysis before deciding to open an investigation, including factors such as the potential monetary penalties and the cost to mount an investigation in the decision to proceed (Dechow et al. [2011], Blackburne et al. [2020]). A response that signals the firm is innocent or will be costly to pursue may therefore deter an investigation.[4]

In cases when the firm's share price does not decline significantly, the firm has little incentive to respond. In some instances, the firm may not even notice that the report was released. If the firm is aware of the report, there is relatively little benefit to responding, as there is no share price decline to try to reverse. Responding carries both direct costs to create and disseminate a public statement and gives rise to liability if the statement is ultimately found to contain errors. Finally, acknowledging the report can be counterproductive if it signals that the firm believes the activist is sufficiently important to warrant a response, thereby increasing the activist's credibility.

[4] General Electric Company (GE) presents an illustrative anecdote: in August 2019, analyst Harry Markopolos published a report alleging accounting fraud at GE, and the shares fell 11% on the day the report was released. GE responded with a rebuttal of the activists claims and the stock price subsequently recovered. However, the SEC was not dissuaded from investigating, and subsequently found that GE engaged in securities violations related to issues raised in the Markopolos report. In December 2020, GE agreed to pay a $200 million penalty to settle the resulting action (AAER 4194, available at https://www.sec.gov/litigation/admin/2020/33-10899.pdf, retrieved February 21, 2021).

If the firm's share price declines following the report's release, it is more likely that the firm's managers will become aware of the report, and this naturally gives rise to a higher probability of responding in some way. When the activist provides data and logical conclusions, and the firm has the ability to verify and dispute the data, a clear denial of the activists' claims is feasible, both to try and repair the share price decline and to forestall regulatory action. When managers are more certain their information is accurate, they should face a lower risk of making a false statement, and thereby be more likely to respond. Another important response seen in Lamont [2012] is to threaten or initiate a lawsuit against the short seller, which benefits the firm by winning damages if it prevails in the lawsuit. Lawsuits are costly, however, involving a significant investment of time and resources, and require the firm to reveal potentially sensitive information to the activist in the discovery process and to the public if the case proceeds to trial. Litigation in this scenario, when the firm believes the activist's report is false, presents a costly and, therefore potentially credible signal that the activist's report is false.

There are nevertheless incentives not to respond. First, the activist may simply report opinions of overvaluation based on an interpretation of the firm's public filings. The firm cannot dispute the source or accuracy of the information, and again acknowledging the activist by engaging in lends the activist credibility. Second, managers may not have high confidence in their position, and avoid responding if the risk of making a false statement is material, which could open them up to liability. A negative stock price reaction may inform managers and directors that the report contains important information, reducing their certainty about the true state of their firm (e.g., Edmans, Goldstein, and Jiang [2015], Zuo [2016]).

When the market declines following the publication of the short seller's report, and the firm's private signal indicates that the allegations are accurate, the decision not to respond is more attractive than revealing the truth because investors only place a partial weight on the activist's allegations (Benabou and Laroque [1992]). Empirically, we do not observe any disclosures in our sample that simply acknowledge the veracity of the short seller's allegations.[5] The firm's managers could choose to issue their own false report, a material possibility when management is involved in a fraud, as the additional liability for an additional false statement may be small relative to the existing liability. The firm may respond by suing

[5] We are aware of one such example outside of our sample. Let's Gowex SA CEO made just such an admission immediately after publication of a report from Gotham City Research. "I made a voluntary confession … I will face the consequences," from the *Financial Times*, "WiFi provider Gowex goes bankrupt and admits falsifying accounts," Buck, T. July 7, 2014. While Gotham City Research is an activist short seller in our sample, Let's Gowex is not included because it was not listed in the United States.

the short seller for defamation as a bluffing strategy, and if the activist has insufficient financial resources to mount a legal defense, they may be forced to settle by agreeing to retract the report. A litigious target firm also signals to regulators and other short sellers that the firm is an expensive target to pursue, reducing the odds that authorities launch an investigation into the firm's activities (Dechow et al. [2011], Blackburne et al. [2020]).

The approach most consistent with the fiduciary duties of independent directors is to launch an internal investigation in cases when the allegations present sufficient red flags to management and/or the board of directors to trigger a duty to investigate (Pan [2010]). It is unlikely that firms conduct such investigations as a routine matter to respond to frivolous allegations, because internal investigations are costly, both in terms of management attention and in terms of out-of-pocket costs for outside law firms to conduct extensive interviews with staff and conduct forensic audits of the firm's books and records. These costs become warranted when the firm expects to benefit materially from either using the findings to secure reduced penalties through cooperation or to mount a vigorous defense (Duggin [2003], Mark and Pearson [2007]).

Internal investigations are unlikely to be a credible commitment to disclose the investigation's findings because the structure includes outside counsel specifically to avoid having to disclose the results, under the protection of attorney-client privilege. The internal investigation then affords the firm an option to either maintain confidentiality or to waive privilege and provide the results to interested parties such as shareholders or the authorities (Mark and Pearson [2007]).[6] Therefore, we predict that firms launch internal investigations when the firm's directors either have significant uncertainty about whether or not fraud has taken place or suspect that fraud has occurred, and the purpose of the investigation is to limit liability and penalties.

At time 4, the accuracy of the activist's report is revealed. We use various firm outcomes to proxy for the report's accuracy. Exchange delisting is evidence of lack of compliance with listing standards, and materially increases the firms' cost of capital (e.g., Schumway [1997]). Allegations of fraud can be validated by subsequent AAERs (e.g., Dechow,

[6] In addition to confirming this prediction in discussions with a partner at a leading activist defense law firm and general counsel at a publicly traded company, industry publications highlight that "…internal investigation protected by the attorney-client privilege can benefit the company in a number of ways" including "insulating management and/or the board…". ("Corporate Internal Investigations: Best Practices, Pitfalls to Avoid" Jones Day, 2013.) Available at https://www.jonesday.com/en/insights/2013/01/corporate-internal-investigations-best-practices-pitfalls-to-avoid (access date: 15.02.2021)

Sloan, and Sweeney [1996], Dyck, Morse, and Zingales [2010]). Target firms may resort to seeking strategic alternatives, i.e., being acquired, which we do not consider to be a good or bad outcome per se.. On one hand, being acquired is material to the firm, represents a potential distress outcome, and often results in managers' employment being terminated (Walsh [1989], Clark and Ofek [1994]). On the other hand, an acquisition implies that an acquirer believes the target firm has sufficiently valuable assets and limited liabilities to be an attractive purchase. In either case, however, it is a significant event for the firm because its existence as an independent entity ends.

Overall, this discussion indicates that several response types are supportable both when the firm believes the activist's report is correct or not. Denials and lawsuits can be an appropriate course of action in either case. The foregoing discussion does provide two clear empirical predictions: First, making any type of response is more likely when there is a significant negative abnormal return around the publication of the activist's report since the firm is more likely to be aware of these reports and has the incentive to try and reverse the price decline and forestall enforcement inquiries. Second, the launching of an internal investigation is more likely when the short seller allegations credibly relate to fraud or other criminal activity and present the target's board of directors with sufficiently compelling red flags to trigger a duty to investigate, and we expect internal investigations to be associated with significant firm outcomes.

3. Data and Overview

3.1. Sample construction

We start with the sample of activist short seller reports used in Ljungqvist and Qian [2016] which includes 126 reports from 17 short sellers from 1994 through 2011. This sample was created by selecting all reports published by all known professional short sellers that satisfied three criteria: the report makes public claims of overvaluation, discloses that the short seller has a short position in the targeted firm, and is made available to the public either on the activist's own website or through a publicly accessible web site such as Seeking Alpha. The short seller must have released more than one report to be included in the sample. We extend this sample using the same methodology to include additional short sellers who issue multiple reports through 2018.

Our extended sample consists of 421 initial short selling reports by 25 repeat short sellers from 1996 to 2018. We limit our search to US-listed targets to provide for a consistent legal, regulatory, and market framework so that our outcome measures, including delisting and enforcement activities, are consistently applied. Excluding 33 unlisted firms and another 37 that lack the financial data needed to compute our control variables, we obtain a final sample of 351 initial reports on unique activist-company events. We manually verify that we have captured all reports issued by these short sellers using the short sellers' websites, the Internet Archive, and the platforms on which the short sellers' reports are distributed, including SeekingAlpha. Of the 351 reports in our sample, 56 are published by anonymous authors, and in untabulated tests, we do not find evidence that anonymity is associated with differences in response rates or outcomes.

After collecting all initial reports, two research analysts coded the allegations made in the reports according to our coding manual which is illustrated with an example report in the Online Appendix A. One or both of the authors reviewed the coding of every report. We observe and record the following major categories of allegations: accounting issues (i.e., issues with revenues, expenses, income, cash flows, assets, liabilities, non-GAAP presentations, auditor issues), disclosure issues (incomplete disclosures, serious errors in disclosures), product and business issues (product quality, Ponzi schemes, inherently unprofitable products, related party transactions, fabricated customers, poor acquisitions or divestitures), management issues (past frauds, management turnover, competence). We also code an indicator variable for

short sellers' specific allegation that the firm is committing securities fraud, (e.g., "… management of Textura is committing FRAUD [sic] on the investing public"). Finally, we code the activist reports with an indicator variable for reports that include new information, as opposed to basing the analysis only on the company's SEC filings. Such new information typically arises when the short seller provides material gathered using private investigators or from local or foreign regulatory filings that are not readily available online. We combine the report characteristics data with returns data from CRSP, financial statement data from Compustat, and media counts from FactSet.

We collect the target firms' responses to the short seller reports by searching for press releases and news articles from Factiva, conference call transcripts from Thomson Reuters Eikon, litigation from Audit Analytics, and 8-Ks from EDGAR. After observing the complete set of responses from these sources, we categorized the responses according to the criteria described in the Online Appendix B. The responses that we observe belong to one or more of five categories. First, firms issue denials of the accuracy of allegations made by the short seller. Second, the firm may disclose additional information, to respond to or rebut the activist's allegations. Third, the target firm may threaten or file a lawsuit against the short seller. Fourth, the firm may announce an internal investigation into the short seller's allegations, conducted by outside counsel. We record an indicator variable for each type of publicly disclosed response made by the firm if it occurs within two weeks of the short seller report date and addresses the report or any allegations made in the report. We record a fifth category, no response, if the firm does not take any of these actions.

Data on firm outcomes were collected from several sources: AAER data is from the USC Leventhal School of Accounting and is described in Dechow et al. [2011]. Delisting and acquisition outcomes are from CRSP, and restatements and auditor changes are from Audit Analytics.

3.2. Descriptive statistics

Table 1 presents descriptive statistics for the activist short sellers and report characteristics. Panel A presents descriptive statistics for each of the activists in our sample. The mean CAR from one day prior to the report's issuance through 60 days following the report issuance is -17%, broadly consistent with the returns observed by Ljungqvist and Qian [2016]. Figure 2 plots the average cumulative abnormal returns surrounding the activist report release

and the significant price decline at the time the report is released which consistent with prior research into the effect of activist short seller reports on target firm returns (Ljungqvist and Qian [2016], Appel and Fos [2020]). We find significant positive cumulative abnormal returns over the 90 days preceding the report's disclosure, consistent with short sellers screening for stocks that might be overvalued based on recent price increases and stock promotions (Aggarwal and Wu [2006]).

We find that firms respond in at least one way to 31% of short seller reports. We also observe variation in report characteristics, depending on the activist, with some alleging fraud in 100% of reports, others in as few as 27% of reports. The presentation of new evidence varies by activist from 0% to 100%. Target firm response rates vary from 0% to 86%. Overall, the activists appear to be a heterogeneous group of investors that make varied allegations and engender different response rates.

Panel B of table 1 presents the frequency of the various allegations and issues we observe in the activist reports. On average there are 5.71 different issues raised per report, including 1.82 accounting issues and 1.38 business issues. At least one business issue occurs 87% percent of reports, and accounting issues occur in 65% of reports. Overall, fraud is alleged in 54% of reports and new evidence is presented in 55% of reports.

Panel C of table 1 presents descriptive statistics on the most commonly bundled sets of allegations present in short seller reports, which helps to understand the scope and style of typical reports. The most common bundle of allegations, comprising 84 of the 351 activist reports in the sample, includes all categories of allegations and provides new evidence. This report style could reflect that the short seller identified serious and fundamental flaws in all aspects of the business, presenting a particularly compelling case of overvaluation including allegations of fraud. The strategy might also be designed to lessen the risk of a defamation claim by making a large number of claims, only some of which need to be true for a reasonable defense. The second most common bundle contains only allegations of overvaluation based on business issues, without giving any new information.

Panel D of table 1 provides descriptive evidence of the evolution of the activist report sample over time. We provide evidence that the number of reports issued increased dramatically in recent years, in particular since 2009. While we do not attempt to identify underlying causes for this rise in activism, we note that the distribution of activist reports using social media, in particular Seeking Alpha (founded in 2004) and Twitter (founded in 2006)

likely increases the reach and publicity of existing activist short sellers, encouraging more analysts to release short-oriented reports. Prior to social media distribution, activists primarily relied on their own websites and in some cases the financial press to rebroadcast their analyses. The target firm response rate has varied from 13% to 46% of reports each year, with an overall average response rate of 31%. We find that the prevalence of new information has become a significant feature of activist short seller reports only since 2007. A general movement by governments and private enterprise to make more data available online in recent years likely provided greater access to new evidence for short sellers.

Table 2 provides descriptive statistics about the target firm's responses and outcomes. Panel A shows that the response rate also varies among firms associated with different outcomes. Only 6% of AAER firms respond to the reports, while 47% of firms that do not have a significant outcome respond, giving initial indications that responses may be associated with less severe outcomes.

To provide descriptive evidence of when firms respond to the activist reports, in figure 3, we plot a histogram of the firm responses relative to the report release day. Most responses happen during the first week following the activist report, with relatively few responses observed more than two weeks following the report release.

Panel A of table 2 shows that 25% of target firms are delisted following the activist report release, and in figure 4 we plot the histogram of delisting events relative to the report release day. This figure illustrates that some firms are suspended from trading and delisted as soon as the same day the activist report is released. [7] The rate of delisting proceeds at a rate of 0.28 to 0.85% of target firms per day over the two weeks following the report release. Although the overall percentage of firms affected on a daily basis is small, the cumulative delisting of 25% of target firms provides evidence that targeted firms frequently violate listing standards.

Panel A of table 2 also illustrates the fraction of firms electing to use each of the various response categories, with univariate outcome rates tabulated for each response option. 31% of firms respond with at least one of the categories we observe. The most common response is a denial of the activist claims, an action taken following 28% of activist reports. 12% of firms

[7] When we manually inspect the reasons for rapid delistings following the short seller report, we find that they are initiated by the NYSE or NASDAQ exchanges on a discretionary basis "for the protection of investors" (e.g., NASDAQ Listing Rule 5101, and Section 1009(d) of the NYSE Company Guide), and the determination is supplemented by other listing rules such as for failure to provide adequate responses to exchange inquiries, or failure to file required forms with the SEC when due.

provide additional disclosures, 6% threaten or file lawsuits against the short seller, and 4% launch internal investigations.

Of firms that launch internal investigations, 29% have subsequent AAER enforcement actions, more than four times the overall of 6% for the sample. Interestingly, these firms that receive fraud actions make denials in response to only 3% of activist reports, compared to a 28% denial rate for the full sample. These firms provide additional information in only 2% of activist reports, compared to a 12% rate for all reports. Collectively this indicates that firms with subsequent fraud findings are much more likely to launch internal investigations and much less likely to make statements that could create additional liability for the firm. Firms launching internal investigations are acquired at a rate of 7%, less than half the 18% rate for the overall sample, and are twice as likely to be delisted, at a rate of 50%, compared to the sample average of 25%, indicating that these firms are harder to value or may bring significant liabilities to an acquirer. We confirm the statistical significance of several of these univariate results in multivariate tests below.

Panel B of table 2 tabulates the univariate association between response options and abnormal returns. Consistent with our predictions, the market response to the short seller's report publication is associated with response choices. The mean announcement return over the three days surrounding the report release (CAR [-1,1]) for all reports is -4%, the mean return associated with response firms is -14%, and the mean return for no-response firms is 0%, suggesting that firms targeted with unfounded reports optimally choose not to respond. Firms that launch internal investigations have announcement returns of -24%, indicating that the set of reports associated with internal investigation firms provided material new information. The application of the Delaware Doctrine implies that these reports raised sufficient evidence of red flags for fraud or other wrongdoing amongst the target firms' management and/or directors to trigger a duty to investigate.

Figure 5 plots average abnormal media attention, with media mentions spike more than 261% on the day of the report's disclosure, suggesting that the activists in our sample are able to reach a wide audience on average, and these reports are likely to gain the attention of investors and managers.

Panel C of table 2 provides descriptive statistics of the firm characteristics for responding and non-responding firms. The univariate difference in firm characteristics is generally statistically insignificant, except for profitability, with responding firms being more

profitable (RoA of -0.01) compared to non-responding firms (RoA of -0.12), indicating that responses are likely related to the characteristics of the report, rather than observable characteristics of the firm.

4. The Activist Short Seller's Targeting Decision

In table 3, we provide a descriptive analysis of the types of firms targeted by activist short sellers. We provide new evidence about the characteristics of target firms, using a probit regression including all listed firms in CRSP and Compustat with the necessary data availability to calculate all the covariates, from 1996 to 2018. The dependent variable is an indicator equal to one for firm-years with an activist report in our sample, and zero otherwise.[8]

Panel A of table 3 provides descriptive statistics for targeted firms and the Compustat universe. Firms targeted by short sellers are smaller than the Compustat average in the mean ($2,241 million for targeted firms versus $3,847 million for the full sample) but are somewhat larger using the median, at $531 million for targeted firms compared to $283 million for all firms. Targeted firms are different on other dimensions, consistent with prior literature on overvaluation, short sellers, and fraud: they have lower book-to-market ratios, lower leverage, are more likely to be foreign-headquartered, have higher short interest, higher Tobin's Q, and are more likely to be earnings manipulators (e.g., Beneish [1999], Lee, Li, and Zhang [2015], Dechow, Sloan, and Sweeney [1996], Dechow et al. [2001]).

Panel B of table 3 presents a probit regression with a dummy variable for being targeted as the dependent variable, and the inferences are generally consistent with panel A, although size is not a statistically significant targeting factor in the multivariate regression. panel B confirms that targeted firms have higher Tobin's Q and lower profitability than the Compustat average. These coefficients have the opposite sign compared to the targeting decision for long activists studied by Brav et al. [2008], who aim to identify undervalued firms. Overall, short sellers appear to target firms with traditional indications of overvaluation, as target firms are significantly more likely to be labeled as manipulators using the M-score, to have recently undergone an IPO, and to be foreign. These factors are associated with the potential for fraud and distorted earnings (Beneish [1999], Lee, Li, and Zhang [2015]). Targeted firms have higher short interest, which is associated with greater limits to arbitrage, and therefore, the publication of a report is a more attractive way to resolve the overvaluation of these firms in a short period of time (Ljungqvist and Qian [2016]).

[8] In a contemporaneous working paper, Appel and Fos [2020] conduct a test of activist short seller targeting, using predictor variables based on Brav et al. [2008], and find that short interest, Tobin's Q, and size are associated with activist reports. Because we expect long and short activists look at different factors, we include variables that are shown in the prior literature to be associated with accounting manipulation, fraud, and restatements.

Figure 6 plots the average short interest for targeted firms in the days surrounding report release, and it illustrates that targeted firms have 9% of shares outstanding sold short 90 days prior to the activist report releases, increasing to 12% at the release date. This can be compared to the Compustat population average short interest of 2%. Short interest remains high over the following 90 days, consistent with Appel and Fos [2020].

Figure 7 presents longer-term plots of several outcome measures, with comparison plots between targeted firms on the left and matched peers on the right. Peer firms are matched using the nearest neighbors from the probit specification in table 3 and are limited to a caliper of 0.1 standard deviations for the independent variables used in the model.

Panel A of figure 7 shows the average rate of delisting from 36 months prior to 36 months following the report release. We observe 3% of targeted firms delisting in the month immediately of the release, with generally 1% to 3% per month being delisted over the following 36 months. The matched firms have a delisting rate between 1% and 2% per month, so for targeted firms, delistings appear significantly more pronounced in the months immediately following the report release compared to peer firms.

Panel B of figure 6 illustrates how targeted firms are significantly more likely than peer firms to face enforcement actions with a histogram of AAER violation periods and announcement dates. The plot on the left shows AAER dates for targeted firms, with light-colored bars used to identify the end of the fraud period cited in the AAER. Dark-colored bars represent the histogram of AAER release dates, which all occur after the activist report release. AAER release dates more than 36 months following the event are included in the 36-month bar. AAERs for peer firms are negligible over the same period. The picture that emerges is that short seller reports are issued generally following or during periods of fraud but before SEC enforcement actions are disclosed. This is not necessarily causal evidence that the SEC identifies fraudulent activity from the short seller reports, the pattern could also be consistent with short sellers and the SEC observing the same warning signs that prompt investigation of the firm, but with the SEC taking longer to complete their investigation and issue an order. We manually examine all the AAERs that follow the activist report and find that 64 percent specifically address issues raised in the short seller reports, indicating that the enforcement actions have a strong relation to the short sellers' allegations, even though we cannot comment on the specific mechanism involved (Dyck et al. [2010]).

Panel C of figure 3 shows that restatements rates are consistent over the event period, but they are somewhat more frequent in the six months following the short seller event for targeted firms, indicating the activist report may prompt auditors to reevaluate previously issued financial reports (e.g., Bockus and Gigler [1998], Krishnan and Krishnan [1997]). Panel D illustrates a 52% increase in auditor resignations from the pre-release period to the post-release period for targeted firms, with lower rates of auditor resignations in both periods for matched firms. In summary, the monthly time series patterns indicate a significant association between the report release and the outcomes we examine.

5. Target Firm Responses and Outcomes

5.1. Report characteristics and target firm responses

We next examine factors associated with the decision to respond and the type of response in a multivariate setting. Panel A of table 4 presents a summary of probit and OLS regressions of firm response types on indicator variables for the major categories of report allegations and an indicator variable if the abnormal return in the three days surrounding report issuance is in the lowest quartile. We include the full set of control variables used in Table 3 panel B in all regressions. Column 1 presents a probit regression specification, and columns 2 through 4 present OLS specifications with no fixed effects, year fixed effects only, and year and activist fixed effects, respectively.

Panel A provides evidence that bottom quartile abnormal returns are significantly associated with making any response, with the previous discussion. Firms in the bottom quartile of returns are between 18 and 29 percentage points more likely to respond, compared to the overall average, consistent with the univariate results. Reports containing new evidence are also a predictor of responding, with a 11 to 17 percentage point increase in the likelihood of responding, significant in all specifications other than the no-fixed-effects OLS specification. It is plausible that when the activist presents data and conclusions using new evidence, management may be better positioned to use the data to verify or refute the allegations more easily than reports based on the opinion of existing data.

Considering specific report characteristics, we find that firms are less likely to respond with lawsuits when reports allege business issues, consistent with these issues presenting opinions that are less actionable in a defamation suit. Internal investigations are strongly associated with first quartile announcement returns, providing evidence that negative returns are associated with reports that present target firms with credible red flags for fraud or other serious wrongdoing.

In Panel B of table 4, we present a similar analysis using the most common report bundles as independent variables. We run separate regressions with an indicator for each bundle included in a stepwise fashion and the full set of control variables from table 3 panel B. The reported coefficients on each bundle, therefore, represent the marginal effect of that bundle compared to all other reports. The results of this analysis show that bundles containing all issues are more likely to be associated with some response, whereas reports that only allege

business issues are associated with a lower likelihood of making any response, as well as lower chances of denials, lawsuit, and additional disclosure responses.

5.2. Target firm responses and significant outcomes

In our final analyses, we examine the association between responses and firm outcomes. Table 5 presents a summary of the probit and OLS regression coefficients of significant firm outcomes regressed on indicators for the firm response types and the full set of control variables.

Table 5 provides no statistically significant evidence that non-response is associated with any of the outcomes we consider. This is consistent with our prediction that there are plausible reasons not to respond both when the firm agrees and disagrees with the activist allegations. Non-responses appear to provide little information to investors about the accuracy of the activists' claims, insofar as they are realized through these outcome measures.9 Lawsuit responses are positively associated with delisting in most specifications, which is not an association we predicted but is consistent with these firms suffering significant damages that they may attempt to recover through litigation.

Internal investigations are associated with a 16 to 22 percentage point greater likelihood of delisting, a 7 to 20 percentage point greater rate of receiving an AAER, and a 9 to 24 percentage point lower rate of being acquired, and these results are statistically significant in all specifications, providing evidence that the internal investigation response is associated with firms that have more adverse outcomes following the report release. We examine each firm that launches an internal investigation (untabulated) and find that of the 14 internal investigations in the sample, only 3 result in a public disclosure that the investigation cleared the firm of wrongdoing, 6 cases disclosed findings that wrongdoing did occur, and in the remaining 5 cases, the firm did not release the investigation results and is also delisted, indicating a finding of wrongdoing likely occurred. Considered together, these results are consistent with firms announcing internal investigations when the activist presented a sufficiently credible case to trigger directors' duty to investigate.

[9] In untabulated tests, we examine if these responses are associated with post-report returns but cannot reject the hypothesis of no effect of response on subsequent returns at standard levels of significance.

6. Conclusion

How firms respond to activist short seller reports is an important question because short activism is an increasingly frequent phenomenon that significantly impacts target firms. Our study provides new evidence about the types of responses firms make in response to short seller reports, and the association of those reports with significant firm outcomes. While the majority of firms choose not to respond publicly to the activist, 31% of firms respond by denying the activists' claims, threatening or launching lawsuits against the activist, providing additional disclosures, and launching internal investigations. Firm response choices are associated with report characteristics and its market impact, as firms are significantly more likely to respond when the activist report is accompanied by more negative abnormal returns and when the report contains new information not already available in public disclosures. Conversely, not responding is associated with more muted stock price response to the report release and fewer adverse outcomes. Launching an internal investigation is an important action, as firms electing this option are more likely to be delisted, more likely to receive a fraud enforcement action, and less likely to be acquired. We extend the literature on internal investigations by providing empirical evidence on the decision to conduct internal investigations and the relation of investigations to short seller activity and firm outcomes. Our study highlights the impact that activist short sellers have on target firms and that firms' responses are associated with firm outcomes.

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Appendix

Appendix A: Variable Definitions

See online appendixes A for example coding of short seller reports, and B for example coding of a target firm response.

Accounting issues	
Revenue	*Indicator variable of value 1 if the target company overstates its revenues, and 0 otherwise.*
Expense	*Indicator variable of value 1 if the target company understates its expenses, and 0 otherwise.*
Income	*Indicator variable of value 1 if the target company overstates its income (e.g., operating income, net income), and 0 otherwise.*
Cash flow	*Indicator variable of value 1 if the target company overstates or misclassifies its cash flow, and 0 otherwise.*
Assets	*Indicator variable of value 1 if the target company overestimates its assets, and 0 otherwise; or if it conducted improper asset recognition, failure to write down the asset or overestimated goodwill.*
Liabilities	*Indicator variable of value 1 if the target company underestimates its liabilities (e.g., off-balance sheet liabilities), and 0 otherwise.*
Non-GAAP	*Indicator variable of value 1 if the target company inadequately uses/discloses Non-GAAP measures (e.g., EBITDA, EBIT, adj. EBITDA, adj. EBIT), and 0 otherwise.*
Audit and internal controls	*Indicator variable of value 1 if the target has a weak auditor, frequent changes of auditors or other internal control issues, and 0 otherwise.*

Disclosure issues	
Incomplete disclosure	*Indicator variable of value 1 if the target company makes vague or inadequate disclosures, and 0 otherwise.*
Errors in disclosure	*Indicator variable of value 1 if the target company makes disclosures that are inconsistent with the law, e.g., fraudulent disclosures, missing documents that are demanded by law/regulation, and 0 otherwise.*

Business issues	
Product	*Indicator variable of value 1 if the target company has bad/fake products, and 0 otherwise.*
Business	*Indicator variable of value 1 if the target company has a flawed business model, e.g., inherent unprofitability due to a competitive market, related party transactions, missing clients and contracts, production facilities non-existing, and 0 otherwise.*
Acquisitions and divestitures	*Indicator variable of value 1 if the target company has made poor or improper acquisitions and divestitures, and 0 otherwise.*
Management issues	

Management	*Indicator variable of value 1 if the target company has issues with the management, incl. past fraud participation, frequent changes of top management (CEO, CFO), and 0 otherwise.*

Securities fraud	*Indicator variable of value 1 if the short seller alleges material lie or omission in connection with the purchase or sale of a security, insider trading. Filings that included false reports (annual report, quarterly reports), and 0 otherwise. Do they use the word "fraud"?*
New evidence	*Indicator variable of value 1 if the short seller provides new information, not in existing securities filings or produces a sufficiently novel analysis of filings to present strong evidence of the alleged improper activity (e.g., photos, legal documents, new analysis, and interpretations), and 0 otherwise.*

Response variables	
Press release	*Indicator variable of value 1 if the target company issues a press release, and 0 otherwise.*
Form 8-K	*Indicator variable of value 1 if the target company issues 8-K filing, and 0 otherwise.*
Conference call	*Indicator variable of value 1 if the target company issues a conference call, and 0 otherwise.*
Denial	*Indicator variable of value 1 if the target company makes a hostile response, incl. insulting the short seller, and 0 otherwise.*
Lawsuit	*Indicator variable of value 1 if the target company makes or threatens to file a lawsuit, and 0 otherwise.*
Internal investigation	*Indicator variable of value 1 if the target company announces to conduct internal investigations, e.g., setting up a special committee, and 0 otherwise*
Additional disclosure	*Indicator variable of value 1 if the target company discloses additional information, and 0 otherwise.*

Outcome variables	
AAER	*Indicator variable of value 1 if the target company has an increase of Accounting and Auditing Enforcement Releases (AAER) after the EVENT_DATE, and 0 otherwise. AAER dataset from the USC Leventhal School of Accounting at the Marshall School of Business (Dechow et al. [2011]).*
Delisting	*Indicator variable of value 1 if the target company is delisted after the EVENT_DATE, and 0 otherwise. CRSP.*
Acquired	*Indicator variable of value 1 if the target company is acquired after the EVENT_DATE, and 0 otherwise. CRSP.*
CAR[-1,+1]	*Is the cumulative abnormal return (CAR) over the window (-1/+1) surrounding the activist short seller report disclosure. cumulative abnormal returns are calculated using the market model:* $CAR[a,b]_i = \prod_{d=a}^{b}(1 + AR_{id}) - 1$, *where* $CAR[a,b]_i$ *is the cumulative*

	abnormal return for firm i for day a through day b. AR_{id} *is calculated as* $AR_{id} = r_{id} - \left[\widehat{\alpha_i} + \widehat{\beta_1}RMRF_d + \widehat{\beta_2}SMB_d + \widehat{\beta_3}HML_d + \widehat{\beta_4}UMD_d\right]$ *, where* AR_{id} *is the abnormal return for firm i on day d,* r_{id} *is the excess return of the stock i for day d over the one month Treasury Bill rate,* $RMRF_d$ *is the excess market return for day d using the value-weighted CRSP index of all firms traded on the NYSE, NASDAQ, and Amex exchanges,* SMB_d*,* HML_d*, and* UMD_d *are the portfolio returns on the size, book-to-market, and momentum portfolios on day d, and* $\widehat{\alpha_i}$ *and the* $\widehat{\beta}$*s are estimated from the equation:* $r_{id} = \alpha_i + \beta_1 RMRF_d + \beta_2 SMB_d + \beta_3 HML_d + \beta_4 UMD_d + \varepsilon_{id}$*, using a pre-event period from event day -252 trading days to event day -20 trading days. Observations with less than 70 days of returns data in the estimation period are dropped. CRSP.*
CAR[+2,+60]	*Is the cumulative abnormal return (CAR) over the window (+2/+60). Firms that are delisted during the post-event window CAR calculate up through the delisting date. CRSP.*
CAR[+2,+252]	*Is the cumulative abnormal return (CAR) over the window (+2/+252). Firms that are delisted during the post-event window CAR calculate up through the delisting date. CRSP*
Severe outcome	*Is an indicator if AAER, delisting, or acquired equals 1.*
Restatements	*Indicator variable of value 1 if the target company had a restatement filed over the subsequent 12 months after the EVENT_DATE, and 0 otherwise. Audit Analytics.*
Auditor change	*Indicator variable of value 1 if the target company had a change of the auditor filed over the subsequent 12 months after the EVENT_DATE, and 0 otherwise. Audit Analytics.*
Abnormal media count	*Use count of media mentions and calculate abnormal media pct in days -65 to -20. Factset, all news sources.*
Daily short interest	*Is the daily percentage of shares outstanding that are shorted. Compustat short_pre/csho/1,000,000*

Control variables	
Log market cap	*Is the log of the market value of equity at the beginning of the fiscal year in which the short seller report is published (Compustat, csho*prcc_f).*
BTM	*Is the ratio of the target company's book value of equity to its market value of equity as of the beginning of the fiscal year in which the short seller's report was published. Compustat, Book/MktCap, where Book is defined as seq-pstk and MktCap as csho*prcc_f.*
Leverage	*Is the ratio of long-term debt to the sum of debt and market value of equity. Compustat, calculated via as (long term debt (dltt)+debt in current liabilities(dlc))/total assets(at).*
Analysts	*Is the log number of equity analysts issuing earnings forecasts for the fiscal quarter in which the short seller's report is published. Compustat and calculated as log(numan + 1).*
Institutional ownership	*Is the percentage of the target company's stock held by institutional investors as of the beginning of the quarter in which the short seller's report is published. Thomson Insider.*

Foreign	*Indicator variable of value 1 if the target company is foreign headquartered. Compustat loc is not "USA".*
Litigation risk	*Kim and Skinner [2011]. Indicator equal to 1 if primary SIC-codes is in the set (2833:2836, 3570:3577, 3600:3647, 5200:5961, 7370:7374, 8731:8734). Compustat*
Short interest	*Is the percentage of shares outstanding that are shorted prior to the short seller's report publication date. Compustat short_pre/csho/1,000,000.*
Q	*Tobin's Q. Compustat ((Long term debt (dltt)+ debt in current liabilities (dlc) + price times shares outstanding (prc*shrout))/(Long term debt (dltt) + debt in current liabilities (dlc)+ (shareholders' equity (seq) – preferred stock (pstk)).*
Dividend yield	*The dividend yield. Compustat (dvp+dvc)/(MktCap+pstk.*
RoA	*Return on Assets. Compustat ibadj/shift(at,1,NA,"lag")?*
Manipulator	*Indicator variable equal to 1 if the M-score is greater than -1.78, and where the M-score is calculated as -4.84 + .920 * dsri + .528 * gmi + .404 * aqi + .892 * sgi + .115 * depi - .172 * sgai + 4.679 * tata - .327 * lvgi (see Beneish [1999] for the calculation of the underlying ratios.) Compustat.*
IPO	*Indicator variable equal to 1 if the report is filed during the first year the company is listed in Compustat.*
Earnings announcement	*Indicator variable of value 1 if the target company's response is within five days of a quarterly earnings announcement date, and 0 otherwise.*
Avg pre-returns	*Cumulative abnormal returns in the (-5/-1) relative to the event date. CRSP.*
Pre-AAER	*Indicator variable of value 1 if the target company had a change of the auditor filed over the prior 12 months after the EVENT_DATE, and 0 otherwise. AAER dataset from the USC Leventhal School of Accounting at the Marshall School of Business (Dechow et al. [2011]) and SEC.*
Pre-Restatement	*Indicator variable of value 1 if the target company had a restatement filed over the subsequent 12 months prior the EVENT_DATE, and 0 otherwise. Audit Analytics.*
Pre-Auditor change	*Indicator variable of value 1 if the target company had a change of the auditor filed over the subsequent 12 months prior the EVENT_DATE, and 0 otherwise. Audit Analytics.*
1st quartile of CAR[-1,+1]	*Indicator variable of value 1 if the target company is in the lowest CAR[-1,+1] quartile, and 0 otherwise. CRSP.*

Figures

Figure 1: Timeline

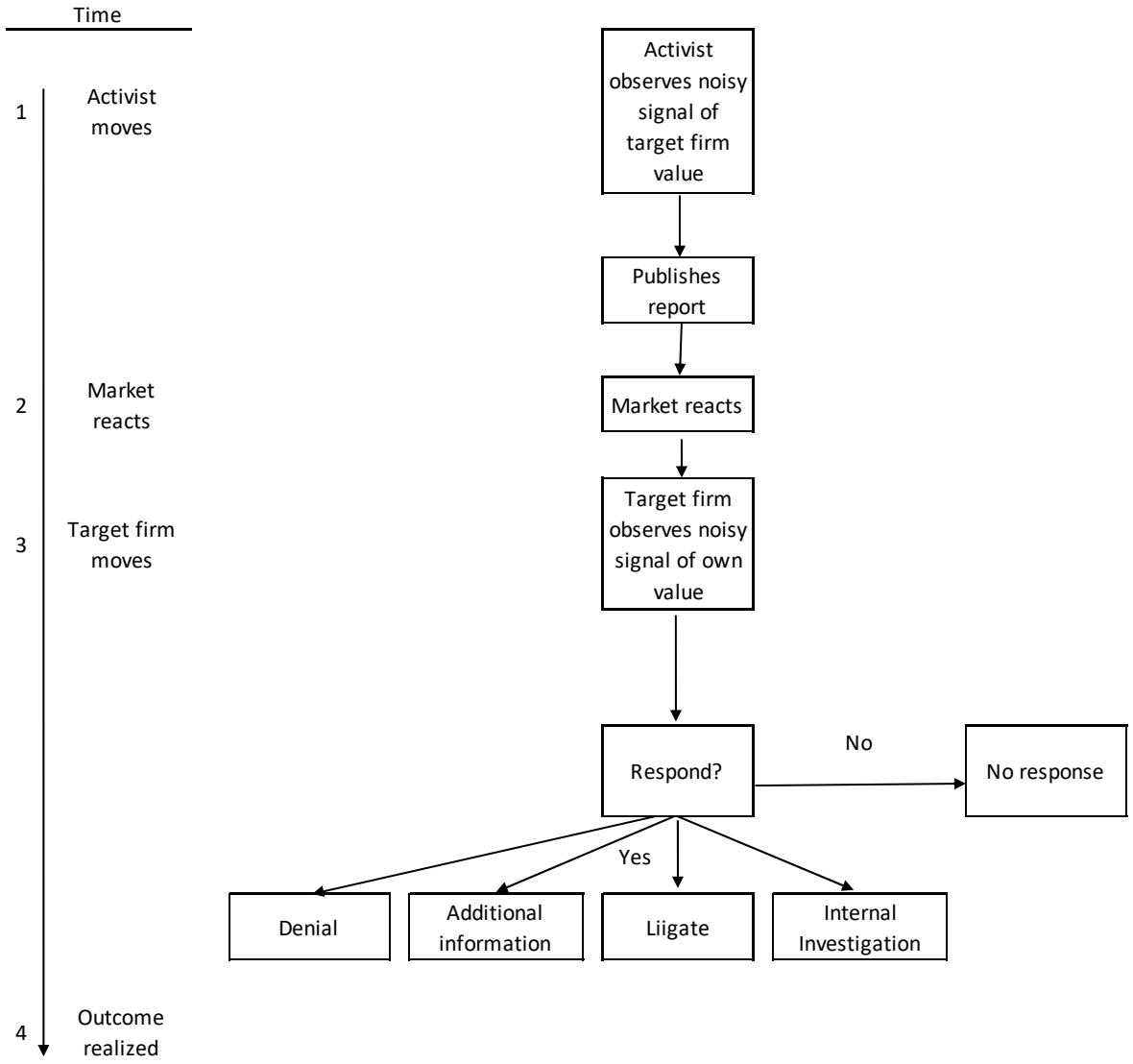


Figure 2: Cumulative Abnormal Returns Around Report Releases

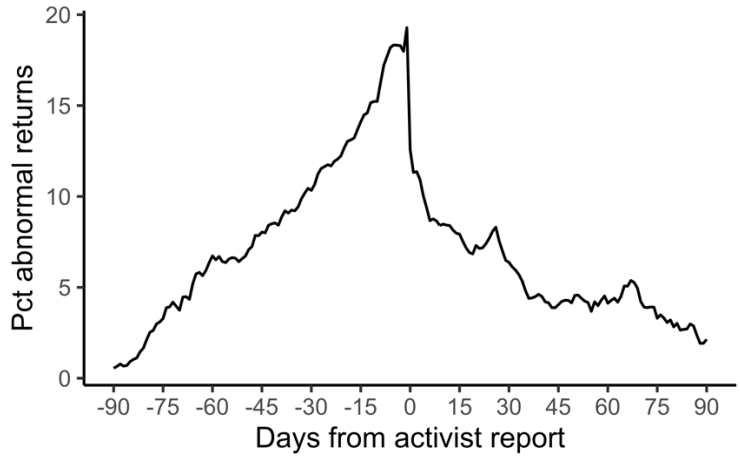


Figure 3: Target Firm Responses Around Report Releases

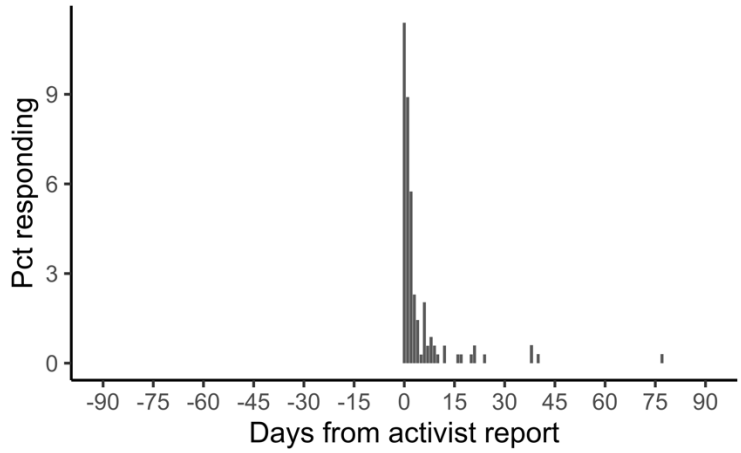


Figure 4: Targeted Firm Delisting Around Report Releases

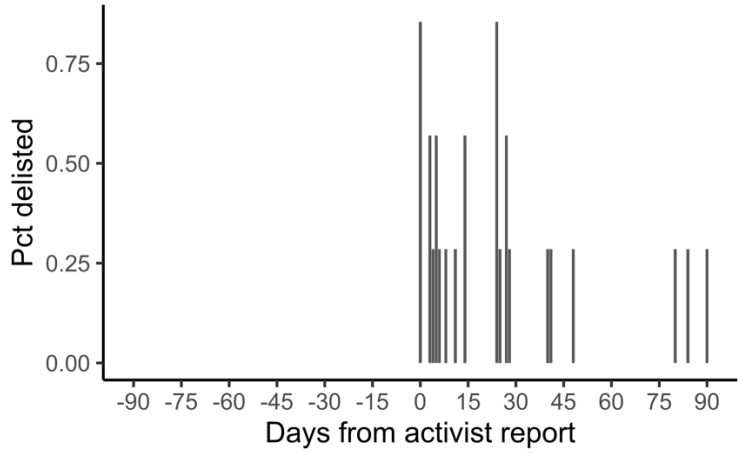


Figure 5: Abnormal Media Mentions Around Report Releases

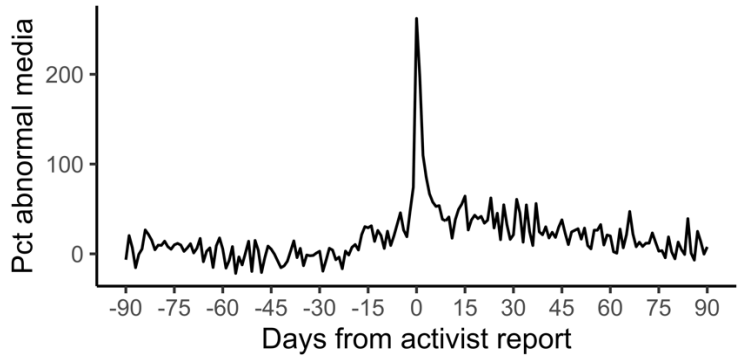


Figure 6: Average Short Interest Around Report Releases

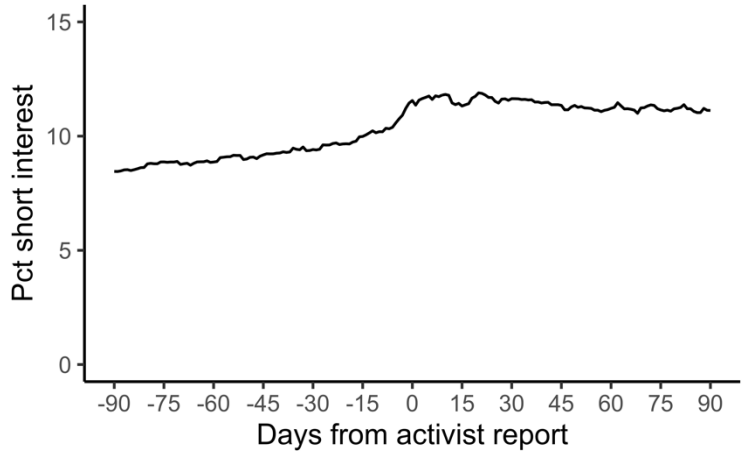
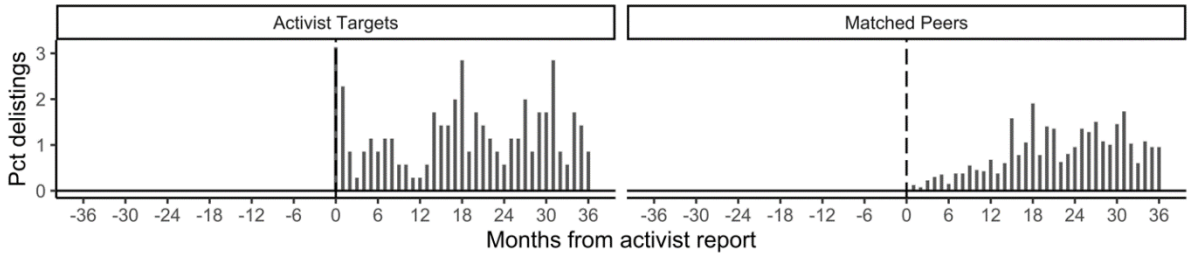
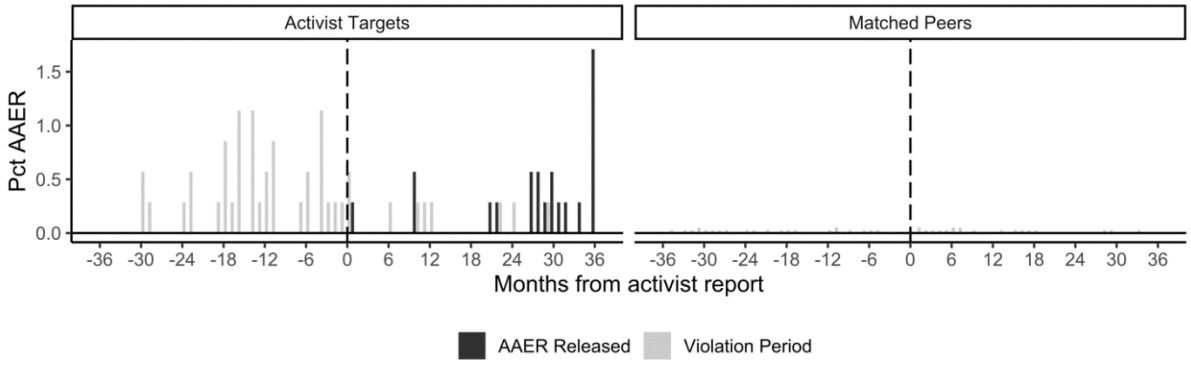


Figure 7: Monthly Descriptive Statistics Surrounding Report Dates

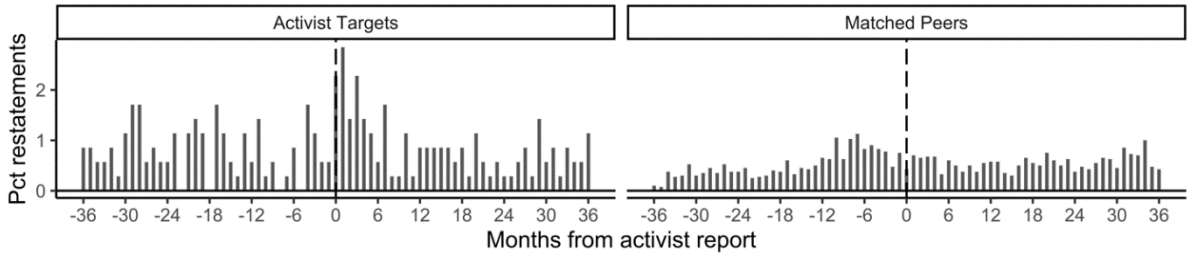
Panel A: Delistings



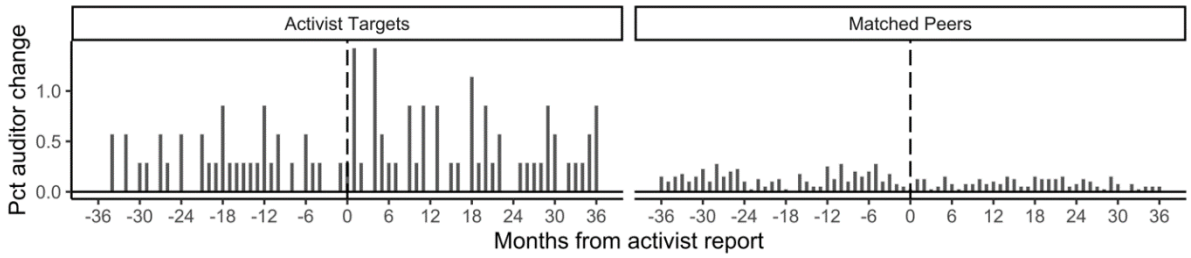
Panel B: AAERs



Panel C: Restatements



Panel D: Auditor changes



Tables

Table 1: Descriptive Statistics of Activist Short Sellers and Report Allegations

The sample contains details of the 351 reports from 25 activist short sellers on US-listed target firms from 1996 to 2018, with available data to calculate required control variables. Fraud allegations, new evidence, and any response are the proportion of reports that allege securities fraud, that present new evidence, and to which companies respond to the short seller's allegations via press releases, conference calls, or Form 8-K filings, respectively. See Appendix A for variable definitions.

Panel A: Activist short seller characteristics

#	*Activist short seller*	*# of reports*	*Fraud allegation*	*New evidence*	*Any response*	*Mean CAR [-1,+60]*
1	Spruce Point	42	0.64	0.93	0.21	-0.14
2	Richard Pearson	41	0.59	0.56	0.15	-0.19
3	GeoInvesting	34	0.47	0.35	0.32	-0.26
4	Citron Research	29	0.41	0.59	0.34	-0.23
5	Asensio & Co.	24	0.46	0.00	0.50	-0.33
6	Kerrisdale Capital	23	0.30	0.35	0.26	-0.25
7	Bleecker Street Research	17	0.59	0.59	0.12	-0.24
8	Pump Stopper	17	0.82	0.88	0.18	-0.25
9	Muddy Waters	16	0.75	0.88	0.75	-0.19
10	Bronte Capital	15	0.47	0.00	0.13	-0.09
11	Prescience Investment	14	0.64	0.93	0.50	-0.09
12	Xuhua	11	0.27	0.27	0.09	-0.12
13	Aurelius Value	9	0.78	0.78	0.67	-0.23
14	Shareholder Watchdog	9	0.33	0.11	0.00	-0.25
15	Glaucus Research	7	0.29	0.57	0.86	-0.21
16	Gotham City Research	7	0.57	1.00	0.71	-0.27
17	Alfred Little	6	0.83	0.83	0.50	-0.18
18	Chimin Sang	5	0.40	0.40	0.20	-0.16
19	Street Sweeper	5	0.40	0.00	0.00	0.45
20	Absaroka Capital Management	4	0.75	1.00	0.75	-0.18
21	Anonymous Analytics	4	0.50	0.50	0.75	-0.01
22	Chinese Company Analyst	4	1.00	0.00	0.00	-0.11
23	The Emperor Has No Clothes	3	0.33	0.67	0.00	2.49
24	Viceroy Research	3	0.33	1.00	0.00	0.05
25	ForensicFactor	2	0.50	1.00	0.50	-0.31
	Total	351	0.54	0.55	0.31	-0.17

Panel B: Report allegation characteristics

Appendix A provides detail regarding the frequency at which the short seller makes allegations addressing various topics among our sample of 351 short seller reports. *Mean* reports the average number of times a topic occurs per report across the sample, for example, there are an average of 1.82 accounting issues per report. For topic areas with various subtopics that we code, we also report the *incidence* or rate of occurrence, reported in parentheses, for at least one of the subtopics, for example, 65% of reports contain at least one accounting issue.

Allegation Topic	*Mean (Incidence)*
Accounting issues	1.82 (0.65)
Audit and internal control	0.39
Revenues	0.30
Assets	0.28
Income	0.26
Cash flows	0.17
Expenses	0.16
Liabilities	0.13
Non-GAAP	0.12
Disclosure Issues	0.84 (0.65)
Serious errors in disclosure	0.46
Incomplete disclosures	0.38
Business Issues	1.38 (0.87)
Business	0.74
Product	0.36
Acquisitions and divestures	0.28
Management Issues	0.58
Securities Fraud	0.54
New Evidence	0.55
Total	5.71

Panel C: Descriptive statistics of report allegation bundles

This table presents the number of analyst reports that correspond to the indicated set of characteristics, which comprise the topics discussed in the report, allegations of securities fraud, and the presence of new evidence.

		Bundle characteristics					
	Number of reports	Accounting issues	Disclosure issues	Business issues	Management issues	Securities fraud	New evidence
All issues	84	X	X	X	X	X	X
Business issues only	34			X			
All issues except securities fraud	23	X	X	X	X		X
Accounting and business issues only	16	X		X			
All issues except new evidence	14	X	X	X	X	X	
Business issues and new evidence only	13			X			X
Others, >= 5 obs.	10		X	X	X	X	
	10	X	X	X			X
	9		X	X			
	8	X		X	X	X	X
	8	X	X	X	X		
	8	X	X	X			
	8		X	X		X	
	7	X	X	X		X	X
	6	X	X		X	X	X
	6		X	X	X	X	X
	5			X	X	X	X
	5			X	X		
Others, < 5 obs.	77						
Total	351						

Panel D: Report characteristics by year

This table provides annual descriptive statistics of report characteristics and topic incidence for the 351 reports in the sample.

Year	# of reports	Any response	New evidence	Securities fraud	Accounting issues	Disclosure issues	Business issues	Management issues
1996	2	0.50	0.00	0.50	0.50	0.50	1.00	0.00
1997	1	1.00	0.00	0.00	0.00	1.00	1.00	1.00
1998	6	1.00	0.00	0.83	0.33	0.83	0.83	0.50
1999	2	1.00	0.00	0.00	0.50	1.00	1.00	0.00
2000	-	-	-	-	-	-	-	-
2001	4	0.00	0.00	0.50	0.25	0.50	0.75	0.25
2002	-	-	-	-	-	-	-	-
2003	1	0.00	0.00	0.00	0.00	0.00	1.00	0.00
2004	1	0.00	0.00	1.00	1.00	1.00	1.00	1.00
2005	1	0.00	0.00	0.00	1.00	1.00	0.00	0.00
2006	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00
2007	4	0.00	1.00	0.50	1.00	1.00	0.25	1.00
2008	4	0.25	0.75	0.25	0.50	0.25	1.00	0.75
2009	7	0.14	0.00	0.14	0.57	0.43	0.86	0.29
2010	24	0.13	0.38	0.46	0.67	0.63	0.83	0.42
2011	48	0.46	0.60	0.60	0.79	0.77	0.75	0.69
2012	20	0.40	0.60	0.60	0.65	0.60	0.95	0.65
2013	42	0.31	0.45	0.38	0.64	0.55	0.86	0.55
2014	46	0.17	0.72	0.65	0.59	0.59	0.87	0.63
2015	40	0.28	0.48	0.53	0.63	0.65	0.95	0.63
2016	29	0.38	0.59	0.52	0.66	0.55	0.93	0.62
2017	36	0.36	0.67	0.58	0.69	0.78	0.94	0.58
2018	32	0.25	0.75	0.63	0.66	0.69	0.97	0.53
Total	351	0.31	0.55	0.54	0.65	0.65	0.87	0.58

Table 2: Descriptive Statistics of Firm Responses

Panel A: Cross tabulation of target firm response and outcomes

This table relates the fraction of events by each combination of target firm response and target firm outcome for our sample of 351 short seller reports to firm outcomes. See Appendix A for variable definitions.

Disclosure type	Target firm outcome						
Target firm response	*All Outcomes*	*AAER*	*Delisting*	*Acquired*	*No Severe Outcome*	*Auditor Change*	*Restatements*
Denial	0.28	0.03	0.26	0.22	0.49	0.06	0.10
Lawsuit	0.06	0.00	0.50	0.10	0.40	0.05	0.05
Internal investigation	0.04	0.29	0.50	0.07	0.14	0.21	0.29
Additional disclosure	0.12	0.02	0.30	0.23	0.44	0.05	0.12
Any response	0.31	0.06	0.26	0.22	0.47	0.06	0.12
No response	0.69	0.07	0.24	0.15	0.55	0.07	0.17
All Reports	*1.00*	*0.06*	*0.25*	*0.18*	*0.51*	*0.07*	*0.15*

Panel B: Abnormal returns by response type

This table presents average cumulative abnormal returns (CARs) over the three days surrounding report release days [-1,+1], the subsequent three-month [+2,+60], and year [+2,+252] periods, and the entire period, [-1/+252]. Statistical significance on the abnormal returns is based on a t-test of the mean difference from zero. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

	Mean CAR			
	[-1,+1]	[+2,+60]	[+2,+252]	[-1,+252]
Denial	-0.14***	-0.16***	-0.30***	-0.37***
Lawsuit	-0.16**	-0.17**	-0.39***	-0.46***
Internal investigation	-0.24***	-0.18	-0.27	-0.35**
Additional disclosure	-0.13*	-0.11*	-0.23**	-0.32**
Any response	-0.14***	-0.15**	-0.29***	-0.36***
No response	0.00	-0.13***	-0.31***	-0.31***
All Reports	*-0.04****	*-0.14****	*-0.30****	*-0.34****

Panel C: Characteristics of responding and non-responding firms

This table provides the mean values for characteristics of responding (N=109) and non-responding events (N=242). Statistical significance is based on a t-test of the mean difference from zero. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

Comparison of response and no response firms			
Variables	Response firms	No response firms	*Difference in Mean*
Market cap	2,309.46	2,209.43	*100.03*
BTM	0.44	0.45	*-0.01*
Q	3.74	4.00	*-0.26*
RoA	-0.01	-0.12	*0.11***
Leverage	0.17	0.14	*0.02*
Dividend yield	0.01	0.01	*0.00*
Analysts	1.42	1.45	*-0.03*
Institutional ownership	0.34	0.36	*-0.02*
Litigation risk	0.30	0.37	*-0.07*
Manipulator	0.36	0.24	*0.11*
IPO	0.17	0.15	*0.01*
Foreign	0.46	0.36	*0.10*
Short interest	0.07	0.07	*0.00*
Pre-AAER	0.01	0.03	*-0.02*
Pre-Restatement	0.43	0.00	*0.43*
Pre-Auditor change	0.57	0.56	*0.01*

Table 3: Activist Short Seller Target Firm Characteristics

Panel A: Characteristics of target companies

This table provides descriptive statistics of short seller target firm characteristics with comparison to the full Compustat universe (N=16,283). The difference in median p-value is calculated using Mood's median test. See Appendix A for variable definitions.

Firm characteristics	*Mean*	*Std. dev.*	*Lower quartile*	*Median*	*Upper quartile*	*Mean of Compustat/ CRSP universe*	*Mean Diff. - p-value*	*Median of Compustat/ CRSP universe*	*Median Diff. - p-value*
Market cap	2,240.50	6,398.61	189.88	531.31	1,358.14	*3,846.52*	*0.00*	*283.19*	*0.00*
BTM	0.45	0.66	0.15	0.31	0.54	*0.64*	*0.00*	*0.51*	*0.00*
Leverage	0.15	0.20	0.00	0.05	0.26	*0.22*	*0.00*	*0.17*	*0.00*
Analysts (log)	1.44	1.00	0.69	1.61	2.20	*1.23*	*0.00*	*1.10*	*0.01*
Institutional ownership	0.35	0.35	0.01	0.23	0.65	*0.33*	*0.32*	*0.23*	*0.06*
Foreign	0.39	0.49	0.00	0.00	1.00	*0.13*	*0.00*	*0.00*	*0.00*
Litigation risk	0.35	0.48	0.00	0.00	1.00	*0.23*	*0.00*	*0.00*	*0.00*
Short interest	0.07	0.07	0.01	0.04	0.10	*0.02*	*0.00*	*0.00*	*0.00*
Q	3.92	4.01	1.55	2.48	4.61	*2.47*	*0.00*	*1.53*	*0.00*
Dividend yield	0.01	0.02	0.00	0.00	0.00	*0.02*	*0.00*	*0.00*	*0.09*
RoA	-0.08	0.39	-0.13	0.03	0.13	*-0.04*	*0.03*	*0.02*	*0.00*
Manipulator	0.28	0.45	0.00	0.00	1.00	*0.16*	*0.00*	*0.00*	*0.00*
Pre-AAER	0.02	0.15	0.00	0.00	0.00	*0.05*	*0.28*	*0.00*	*0.46*
Pre-Restatements	0.48	0.50	0.00	0.00	1.00	*0.01*	*0.00*	*0.00*	*0.00*
Pre-Auditor Change	0.56	0.50	0.00	1.00	1.00	*0.05*	*0.00*	*0.00*	*0.00*
Earnings announcement	0.14	0.35	0.00	0.00	0.00	-	-	-	-
Avg pre-returns	0.01	0.34	-0.09	-0.03	0.02	-	-	-	-
CAR[-1,+1]	-0.04	0.61	-0.14	-0.06	-0.01	-	-	-	-
CAR[+2,+60]	-0.14	0.31	-0.32	-0.14	0.03	-	-	-	-
CAR[+2,+252]	-0.30	0.48	-0.68	-0.41	0.02	-	-	-	-

Panel B: Probit analysis of targeting

This table reports a probit regression of the probability of being targeted by an activist short seller in our sample. The dependent variable is an indicator variable equal to one if an activist short seller targets the firm-year observation. based on the prior year-end realization of the financial variables. See Appendix A for variable definitions. The marginal probability column indicates the change in probability of targeting induced by a one-standard deviation change in the values of the covariate from their respective sample averages. *. **. and *** indicate statistical significance at the 10%. 5%. and 1% levels (two-tailed), respectively.

Dependent Variable: Dummy (of Being Targeted)	*Coefficient*	*z-value*	*Marg. Prob. %*
Log market cap	0.01	*0.78*	*0.00%*
BTM	-0.09*	*-2.12*	*-0.06%*
Q	0.02**	*3.22*	*0.01%*
RoA	-0.16*	*-2.42*	*-0.10%*
Leverage	-0.45***	*-4.42*	*-0.28%*
Dividend yield	-2.81**	*-2.75*	*-1.77%*
Analysts	0.02	*0.81*	*0.01%*
Institutional ownership	0.08	*0.91*	*0.05%*
Manipulator	0.18***	*4.06*	*0.13%*
IPO	0.28***	*4.84*	*0.24%*
Litigation risk	0.02	*0.04*	*0.01%*
Foreign	0.54***	*11.32*	*0.54%*
Short interest	3.40***	*14.12*	*2.14%*
Restatement	0.11	*0.07*	*0.08%*
AAER	-0.17	*0.19*	*-0.09%*
Pre-Auditor change	0.29***	*4.38*	*0.26%*
N	148,776		
Pseudo-R^2	0.10		
Percent targeted	0.22%		

Table 4: Report Characteristics and Firm Responses

Panel A: Report characteristics and firm responses

This table provides the probit and ordinary least square regression coefficients of interest for specification including year and short seller fixed effects with clustered standard errors based on short sellers. All regressions include the control variables included in panel B of table 3. See Appendix A for variable definitions. N=351. $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

	Probit		OLS		
			No Fixed Effects	Year F.E.	Year and Activist F.E.
	Coef. (1)	*Marg. Prob. %*	Coef. (2)	Coef. (3)	Coef. (4)
Dependent variable: Any Response					
Accounting issues	0.21	*6.57*	0.06	0.07	0.10*
Disclosure issues	0.26	*8.39*	0.06	-0.00	0.02
Business issues	-0.29	*-9.95*	-0.08	-0.15*	-0.21**
Management issues	-0.09	*-2.94*	-0.02	-0.01	-0.00
Securities fraud	0.03	*1.03*	0.01	0.01	0.01
New evidence	0.35**	*11.34*	0.10	0.17**	0.15**
1st quartile CAR[-1,+1]	0.82***	*29.20*	0.28***	0.23***	0.18***
Dependent variable: Denial					
Accounting issues	0.17	*4.90*	0.04	0.06	0.08
Disclosure issues	0.28	*8.21*	0.06	0.00	0.03
Business issues	-0.12	*-4.90*	-0.03	-0.08	-0.14
Management issues	-0.21	*-6.28*	-0.04	-0.04	-0.03
Securities fraud	0.01	*0.33*	0.01	0.01	0.01
New evidence	0.41**	*12.06*	0.11	0.17***	0.14**
1st quartile CAR[-1,+1]	0.70***	*23.56*	0.23***	0.18***	0.13**
Dependent variable: Lawsuit					
Accounting issues	0.00	*0.00*	-0.01	0.00	0.02
Disclosure issues	0.09	*0.24*	0.01	-0.02	-0.01
Business issues	-0.86***	*-5.60*	-0.11***	-0.12***	-0.09**
Management issues	-0.64*	*-2.35*	-0.03	-0.02	-0.03
Securities fraud	0.54	*1.64*	0.05	0.03	0.02
New evidence	0.43	*1.27*	0.03	0.06**	0.07***
1st quartile CAR[-1,+1]	0.54*	*2.34*	0.07	0.04	0.01
Dependent variable: Internal investigation					
Accounting issues	1.43**	*0.25*	0.04	0.04	0.06**
Disclosure issues	0.42	*0.06*	-0.01	-0.01	0.00
Business issues	-0.46	*-0.14*	-0.04	-0.04	-0.06
Management issues	-0.47	*-0.09*	0.01	0.01	0.01
Securities fraud	-0.43	*-0.08*	-0.02	-0.03	-0.03
New evidence	0.06	*0.01*	-0.01	-0.01	0.00
1st quartile CAR[-1,+1]	1.55***	*1.56*	0.10**	0.10**	0.09**

Continued…

	Probit		OLS		
			No Fixed Effects	Year F.E.	Year and Activist F.E.
	Coef. (1)	*Marg. Prob. %*	Coef. (2)	Coef. (3)	Coef. (4)
Dependent variable: Additional disclosure					
Accounting issues	0.20	*2.98*	0.03	0.03	0.04
Disclosure issues	0.28	*4.19*	0.03	0.01	0.03
Business issues	-0.34	*-6.19*	-0.07	-0.09*	-0.12**
Management issues	0.17	*2.06*	0.04	0.03	0.06
Securities fraud	-0.12	*-1.87*	-0.02	-0.01	-0.01
New evidence	-0.02	*-0.36*	-0.00	0.03	0.03
1st quartile CAR[-1,+1]	0.31	*5.31*	0.09*	0.09	0.07

Panel B: Report allegation bundles and firm responses

This table provides the probit and ordinary least square regression specification including year and short seller fixed effects with clustered standard errors based on short sellers. The regressions are conducted in a stepwise manner, with an independent dummy variable included for a single bundle with each regression. The complete list of bundle definitions is provided in panel C of table 1. All regressions include the control variables included in panel B of table 3. See Appendix A for variable definitions. N=351. $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

	Probit		OLS		
			No Fixed Effects	Year F.E.	Year. Activist F.E.
	Coef. (1)	*Marg. Prob %*	Coef. (2)	Coef. (3)	Coef. (4)
Dependent variable: Any response					
All issues	0.44***	*15.63*	0.16**	0.14*	0.09
Business issues only	-5.38***	*-30.82*	-0.33***	-0.31***	-0.30***
All issues except securities fraud	0.04	*1.21*	0.01	0.01	0.01
Accounting and business issues only	-0.81	*-20.10*	-0.17**	-0.15**	-0.13**
All issues except new evidence	-0.02	*-0.72*	-0.01	-0.04	0.08
Business issues and new evidence only	0.45	*0.16*	0.14	0.14	-0.02
Dependent variable: Denial					
All issues	0.37**	*12.00**	0.12*	0.11	0.06
Business issues only	-5.28***	*-27.22*	-0.30***	-0.26***	-0.25***
All issues except securities fraud	0.12	*4.02*	0.04	0.02	0.03
Accounting and business issues only	-0.75	*-17.38*	-0.16**	-0.13*	-0.13*
All issues except new evidence	-0.18	*-5.25*	-0.05	-0.09	0.00
Business issues and new evidence only	0.55	*19.73*	0.17	0.20*	0.05
Dependent variable: Lawsuit					
All issues	0.04	*0.20*	0.02	0.02	0.02
Business issues only	-4.42	*-2.36*	-0.05**	-0.04*	-0.06**
All issues except securities fraud	-0.14	*-0.63*	-0.02	-0.01	0.01
Accounting and business issues only	-4.08	*-2.21*	-0.05**	-0.05**	-0.04**
All issues except new evidence	-0.13	*-0.59*	-0.01	-0.05	0.01
Business issues and new evidence only	0.23	*1.46*	0.02	0.03	0.03
Dependent variable: Internal investigation					
All issues	0.16	*0.43*	0.01	0.01	0.00
Business issues only	-5.04	*-0.82*	-0.03	-0.03	-0.06*
All issues except securities fraud	0.69	*2.73*	0.03	0.05	0.06
Accounting and business issues only	-3.86	*-0.91*	-0.03	-0.02	-0.02
All issues except new evidence	-4.41	*-0.90*	-0.06**	-0.08***	-0.04
Business issues and new evidence only	-3.81	*-0.89*	-0.02*	-0.03*	-0.07***
Dependent variable: Additional disclosures					
All issues	0.20	*3.44*	0.04	0.04	0.03
Business issues only	-4.56	*-10.32****	-0.13***	-0.13***	-0.14***
All issues except securities fraud	0.09	*1.55*	0.00	-0.02	0.00
Accounting and business issues only	-0.24	*-3.39*	-0.04	-0.05	-0.07
All issues except new evidence	0.66*	*15.34*	0.17	0.18	0.23
Business issues and new evidence only	0.14	*2.46*	0.06	0.07	-0.02

Table 5: Target Firm Responses and Outcomes

This table provides the probit and ordinary least square specification including year and short seller fixed effects with clustered standard errors based on short sellers. All regressions include the control variables included in panel B of table 3. See Appendix A for variable definitions. N=351. *. **. and *** indicate statistical significance at the 10%. 5%. and 1% levels (two-tailed), respectively.

	Probit		OLS		
			No Fixed Effects	Year F.E.	Year, Activist F.E.
	Coef. (1)	*Marg. Prob %*	Coef. (2)	Coef. (3)	Coef. (4)
Dependent variable: Delisted					
No response	0.60	*12.72*	0.14	0.09	0.08
Denial	0.05	*-1.23*	0.02	0.01	-0.01
Lawsuit	0.79**	*36.78*	0.23**	0.12*	0.06
Internal investigation	0.74*	*22.18*	0.19***	0.19***	0.16***
Additional disclosures	0.52	*13.00*	0.12*	0.09	0.09
Dependent variable: AAER					
No response	-0.33	*-0.35*	-0.12	-0.10	-0.14
Denial	-1.07	*-0.67*	-0.16	-0.11	-0.13
Lawsuit	-5.52	*-0.72*	-0.07	-0.09	-0.14*
Internal investigation	1.34**	*6.69*	0.20**	0.20**	0.18**
Additional disclosures	-0.32	*-0.20*	-0.04	-0.04	-0.04
Dependent variable: Acquired					
No response	-0.28	*-5.36*	-0.05	-0.08	-0.10
Denial	0.28	*5.31*	0.08	0.02	0.02
Lawsuit	-0.65	*-7.76*	-0.15*	-0.05	-0.04
Internal investigation	-0.97*	*-9.38*	-0.21**	-0.22***	-0.24***
Additional disclosures	-0.10	*-1.63*	-0.02	-0.04	-0.03
Dependent variable: Restatements					
No response	-0.14	*-2.84*	-0.06	-0.07	-0.07
Denial	-0.46	*-7.96*	-0.11	-0.10	-0.08
Lawsuit	-0.81	*-9.95*	-0.11	-0.15*	-0.28**
Internal investigation	0.52	*13.03*	0.10	0.11	0.08
Additional disclosures	0.05	*0.89*	0.00	-0.01	-0.02
Dependent variable: Auditor Change					
No response	-0.38	*-0.40*	-0.01	0.02	0.02
Denial	-0.40	*-0.28*	-0.02	0.04	0.06
Lawsuit	-1.12	*-0.33*	-0.07	-0.10	-0.14
Internal investigation	0.76	*1.80*	0.11	0.08	0.06
Additional disclosures	-0.25	*-0.17*	-0.04	-0.04	-0.06

Banks and their Supranational Monitors – Do Monitoring Trustees Impact the Transparency of Banks?

Janja Brendel
Humboldt-Universität zu Berlin

Abstract

The last financial crisis saw large amounts of taxpayers' money used to save banks. Given the incentives of banks to offer an obfuscated view of their financial health, I investigate in this paper whether banks that receive state aid become more transparent when a supranational monitoring trustee (MT) is assigned to the bank, compared to banks without these monitors. Using a hand-collected sample of European banks that obtained state aid at different times in different countries, the staggered introduction of the MTs allows for a difference in differences analysis of the impact of the MT on financial reporting transparency. The MT's presence is associated with higher levels of loan loss allowances. Banks with MTs are more likely to restate their financial statements when it comes to restatements regarding the income statement and cash flow statement. Both findings seem to be driven by the banks that also disclose having MTs. In a subsample analysis of listed banks, however, banks that disclose the presence of an MT in their annual reports tend to have significantly lower credit risk disclosure scores than the banks that do not disclose their presence in a univariate comparison.

JEL Codes: *E58, G21, G28, M41*

Keywords: *Banks, State Aid, Bank Regulation, Loan Loss Reporting, Monitoring, Supervisors*

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1. Introduction

In both the United States of America (USA) (Gorton and Metrick [2012]) and Europe, a flood of capital assistance to banks occurred following the start of the financial crises in 2007.[1] Countries in the European Union (EU) provided more than €600 billion in capital and loans as well as more than €1,200 billion in guarantees to banks as of 2015.[2] Many European banks were rescued through a range of state aid measures that included equity capital injections and government guarantees but also asset relief programs. Some of these banks have received further additional supervision through an external supranational monitor, a so-called Monitoring Trustees (MT) after obtaining state aid, whereas other banks have remained only under the oversight of their national regulators.[3] Being the "eyes and ears" (Brueckner and Hoehn [2010], p.75) of the EC, the MT usually oversees the implementation of the commitments and agreements made in these state aid cases. The MT can be one or more natural or legal person(s) and in most observable cases in my sample, the MT is usually a private consulting or auditing firm (Brownsword, Van Gestel, and Micklitz [2017]), such as KPMG or Grant Thornton, because these firms have the skill set required by the EC.[4]

This study is the first study to investigate what duties have been assigned to these MTs that were sent to banks, as well as whether and how these supranational MTs may change the financial reporting transparency and financial reporting behavior of banks. Transparency is here defined as the availability of bank-specific, value-relevant information available to external stakeholders (similar to Guo, Jin, Kanagaretnam, and Lobo [2020]). While this supranational monitoring mechanism has been employed relatively often in merger control cases in the EU[5],

[1] In the USA, the Emergency Economic Stabilization Act of 2008 (Division A of Public Law 110-343) established the Troubled Asset Relief Program (TARP) to allow the US Treasury department to purchase and guarantee of "troubled assets." $700 billion were initially authorized in the TARP. Source: https://www.cbo.gov/publication/56300 (access date: 14.08.2020)

[2] Details are obtained from the papers by the Competition Directorate–General of the European Commission; link: https://ec.europa.eu/competition/publications/csb/csb2015_001_en.pdf (access date: 15.01.2019)

[3] As described in this news article by Reuters link: https://www.reuters.com/article/us-greece-banks/greek-banks-face-extra-monitoring-in-return-for-aid-idUSBRE8AF11E20121116 (access date: 21.12.2019), Greek banks received MTs as part of the state aid commitment.

[4] Though the majority of MTs seems to include private consulting or auditing firms, I could also observe a case in 2017 where a natural person, Claudia C. Oddi, was appointed as an MT, related to the case SA 43390 2016/N. But these "one man shows" seem to be no longer common according to one of my interview partners.

[5] The legal basis for EU Merger Control is Council Regulation No 139/2004, the EU Merger Regulation. Mergers and acquisitions, which would significantly reduce competition in the European Single Market, are prohibited. For instance, if a merger would result in dominant companies that are likely to raise prices for consumers, the transaction would only be allowed if certain conditions and obligations are met. The European Commission (EC) views a MT as a natural and legal person that is appointed by the merging parties and approved by the EC to monitor compliance with these conditions and obligations. Non-compliance would result in either in a disproval or in a reversal of the transaction. Given the severity of the global financial crises

it was the first time during the financial crisis that MTs were assigned to banks during the state aid cases by the Directorate-General for Competition (DG COMP), which is part of the European Commission (EC)[6]. The DG COMP is responsible for establishing and implementing the competition policy for the European Union and which has a dual enforcement role containing an investigative role and a decision-making role.[7] Though some prior studies investigate state aid in Europe and suggest that state aid to banks has been able to restore trust in the financial markets (Barucci, Colozza, and Milani [2019], p. 2), it is not clear at all what role the new supranational MTs have played.

Given their strong enforcement power and monitoring rights (see Appendix D for an overview of their far-reaching competencies), the MT may influence a bank's financial reporting transparency through two main channels. Firstly, MTs can influence the information generating of bank managers by demanding more and/or better information regarding certain issues, such as loan impairments or allowances. Following the proposition made by Verrecchia [1990], the market will exert more pressure on the manager to disclose information when the quality of the information possessed by the manager increases, especially when market participants are aware of the MT's presence. Nevertheless, it is still possible that shareholders and other stakeholders free ride on the MT's presence – and engage in so-called delegated monitoring (e.g., Diamond [1996]) without increasing banks' transparency. Secondly, the EC asked for more foreseeable losses to be disclosed (e.g., "Impaired Assets Communication", 2009/C 72/01 of 25.02.2009, see Appendix C)[8] and it may be using the assignment of the MTs to increase market discipline. Prior literature, however, hints to potential forbearance strategies (e.g., Huizinga and Laeven [2012], Gallemore [2020], Cole [2017]) with a focus on the national level. These strategies may also take place on the supranational level and banks might be allowed to "go dark", i.e., to become opaquer, to recover under state aid (e.g., Agarwal, Lucca, Seru, and Trebbi [2014]). Hence, one would not expect banks to disclose more or better

in Europe and the complexity of the banking industry, it was decided to also use this new monitoring tool for the many state aid cases in the banking industry.

[6] According to my interview with to Dr. Andreas Bergmann, the sheer number of state aid cases during and after the last global financial crisis (GFC) and the complexity of the banking industry, made the DG COMP to receive support from the MTs in the monitoring of state aid commitments.

[7] DG Competition is one of the most sophisticated antitrust enforcers in the world, alongside US agencies Federal Trade Commission and the Antitrust Division of the Department of Justice. Its policy areas include antirust, mergers, liberalization, state aid as well as international cooperation; link https://www.irishtimes.com/news/consumer/background-what-is-the-ec-s-competition-directorate-1.3143166 (access date: 29.01.2020)

[8] Apart from institutions like the Basel Committee on Banking Supervision, the International Monetary Fund, and the World Bank, the European Commission (EC) also gave guidance in its Communications (e.g., "Impaired Assets Communication", 2009/C 72/01 of 25.02.2009, see Appendix C) to actively encourage more disclosures concerning future losses.

information. Prior findings, nevertheless, suggest that the regulator's reputation can be potentially harmed by forbearance strategies (e.g., Morrison and White [2013]) and that it may be suboptimal for regulators with a strong reputation. Engaging in secret forbearance strategies can never be fully ruled out (Gallemore [2020]) because they are difficult to observe but the setting in the EU seems to provide strong incentives to adhere to the EU rules on State Aid[9] reducing the incentives to engage in forbearance strategies that serve national interests. Given the EC's wide powers to investigate and penalize breaches this monitoring mechanism may circumvent political interference (e.g., Tiebout [1956]) from the national regulators, national regulatory laxity as well as potential regulatory arbitrage (e.g., White [2011]).

The European setting in this study is helpful for several reasons. First, in contrast to the state aid measures taken in the USA, European banks have received state aid measures at different points in time and of different magnitudes. I rely on a setting where banks face similar external incentives to provide transparent reporting because they are subject to similar economic shocks and have similar business models. Second, it is helpful that some banks have received state aid with MTs and some banks have received state aid without MTs and that, according to the DG Comp, there is no standard procedure with regards to the process of the selection of the MT. Third, focusing on banks in the EU allows me to focus on a supranational monitoring mechanism that has a strong legal assertiveness towards the participating banks that may circumvent the problems usually linked to national regulators and national enforcement such as regulatory capture (e.g., Agarwal, Lucca, Seru, and Trebbi [2014], Boyer and Ponce [2012]) and potential "turf fights" among regulators. Also, differences in regional supervisory characteristics (Agarwal et al. [2014], Granja and Leuz [2018]) may matter less in this setting given the supranational contractual binding legal commitments between the European Commission and the involved banks.

The analyses of this study proceeds in the following steps. First, the MT, its characteristics, its duties, and the EU setting are studied and explained (see Appendix D) in detail. Secondly, using a hand-collected sample of European banks that have received state aid during the period between 2005-2019, I check whether banks that have received state aid and MTs have been structurally different in the pre-crises years than their peers that have not been supervised by MTs. Moreover, I analyze which observable country and bank characteristics can help to explain the assignment of an MT because it is difficult to observe and obtain information

[9] These incentives include retroactive action against illegal state aid, repayment of the state aid including interest, lawsuits against the bank, reputational damage, etc.

about this assignment process from the EC. Then, to operationalize changes in financial reporting transparency, I investigate whether those banks with MTs have changed their loan loss reporting behavior and whether banks with MTs are associated with more financial restatements. I check whether results only hold for banks that disclose the presence of the MT. Lastly, I also operationalize reporting transparency by constructing a disclosure score. For a small subsample of listed banks, I investigate whether banks with MTs that disclose having MTs have increased their credit risk disclosures over time by composing a hand-collected disclosure index like Nier [2005] and Bischof, Rudolf, and Elfers [2020a].[10]

After comparing the bank with MTs and those banks without MTs, banks are more likely to be assigned MTs when the regulatory quality index is lower and when the bank faces a more complex state aid structure, including for example asset relief measures, longer duration, or recapitalizations. On a univariate comparison, banks with MTs seem to have more disclosed loan loss allowances but fewer disclosed non-performing loans. Employing a yearly panel of bank-level data in a staggered difference-in-differences design from 2003-2018, I find that banks' loan loss reporting behavior changes only significantly for the loan loss allowance ratio after controlling for changes in the underlying credit portfolio and using original filings. I interpret this evidence as consistent with the notion that banks' reporting choices are influenced by the MT beyond simple compliance with accounting standards. Considering restatements, evidence indicates that banks with MTs are more likely to engage in restatements that relate to the income statement and cash flow statement. These findings only hold for the group of banks that also disclose having an MT. Using a subsample of listed banks for the period 2006-2016, I find a minor statistically significant difference in the credit risk disclosure score: banks with MTs that disclose the presence of the MT in the annual report have a lower disclosure score compared to banks with MTs who do not disclose it.

This paper contributes to the lack of empirical evidence on the economic consequences of these newly implemented supranational supervisors. Apart from studies in the law literature (e.g., Brueckner and Hoehn [2010], Tyagi [2019]), studies on the economic consequences of MTs and their relation to bank transparency have not been conducted yet to the best of my knowledge. This is the first paper that studies the role of MTs and how they relate to the financial reporting transparency of banks. Determinants of bank financial reporting transparency (Guo et al. [2020], Bushman [2014]) have been an important subject of prior literature because the lack of transparency of banks played a major role in the global financial

[10] The taxonomy of the disclosure index follows Bischof et al. [2020a].

crisis (GFC) by impairing bank regulators' and market participants' understanding of banks' risks (e.g., Acharya and Richardson [2009]). Secondly, this study contributes to the literature that examines the role of public regulatory enforcement of the banking system with a focus shifting from national to supranational supervisors. Prior literature primarily has used cross-country settings to examine how national bank supervisors and regulators shape the financial reporting properties of banking systems (e.g., Bushman and Williams [2012], Costello, Granja, and Weber [2019]). Only some recent papers (e.g., Gerhardt and Vennet [2017]) have started to speak of undefined "supervisory pressure" (e.g., Gerhardt and Vennet [2017]) in the European setting without further investigating the additional monitoring mechanism of MTs during the last financial crises. I add to this literature by exploring this novel mechanism with hand-collected data to study the interplay of supranational regulatory oversight and bank transparency. Lastly, my findings can also inform regulators globally (e.g., Rixin [2015]) via helping to better understand the EC's experiences with the deployment of MTs and related policies.

2. Background and Related Literature

2.1. European Union and state aid

Many European banks were rescued through a range of state aid measures (e.g., equity capital injections, government guarantees, asset relief programs, etc.) during the last financial crisis. Various economists believe that this assistance to banks has changed the public perception of the government safety net (Kashyap, Rajan, and Stein [2008]) and may have impacted the future behavior of banks. The economic significance of the past state aid decisions in Europe has been enormous: €665 bn (~5% of the EU's GDP in 2008) were deployed via capital-like aid instruments and €1,296 bn in liquidity aid instruments have been used since 2008. Between 2007 and 2014 over 400 state aid decisions (note that one bank may have more than one state aid decision) have been conducted in the financial sector with over 100 banks involved (incl. private banks). To get an idea of the economic significance of state aid granted in the financial sector, one may consider the ratio of the financial support to the total public debt: as of 2015, the state support to the financial sector represented in many affected countries more than 10% of total public debt, for example in Greece (14.5%), Ireland (28.5%), Cyprus (19.3%) or Germany (10.4%) (European Commission [2017]).

Apart from the economic significance of this setting, this paper tries to make use of some peculiarities of the European setting and regulatory particularities to learn more about the new supranational supervisors, the MT, that has been assigned to banks. First, focusing on banks in the EU allows me to observe banks, unlike banks in the US, that have obtained state aid at different points in time and different magnitudes with different state aid types. Many of these European banks have received significant financial support from their governments, often – but not only – in the form of equity capital injections during the latest financial crisis.[11] Second, the setting provides a transnational competition policy with strict rules on state aid in contrast to the US whose competition law has no written rules on state aid. Given the broader literature on the merits and pitfalls of relying on national public enforcement to ensure compliance with financial regulation (e.g., Christensen, Hail, and Leuz [2016]), one crucial differentiating factor in the European setting is that it unites all the different cases of financial support under the umbrella of the European Union and its rules: The European Union provides

[11] Bank government ownership in the European banking industry has increased. According to Iannotta et al. [2013], the average share of the equity capital of banks owned by banks increased from 5.4% in 2007 to 7.3% at the end of 2009.

a competition policy with strict rules on any form of state aid concerning all operating firms in the EU. These rules include strict procedures, sanctions in case of misconduct, and additional monitoring, including the role of MTs that will be explained below in greater detail. These procedures aim at making sure that firms obey the competition law of the EU.

These rules on state aid in the EU are important and deserve a short description: These rules have been implemented to safeguard the Treaty of Rome [1957] (here the Treaty or TFEU) which has laid the foundations of European Community competition policy. Its core aim is to ensure that competition in the internal European market is not obstructed by the anticompetitive behavior of firms or national authorities. The Treaty contains provisions on anti-competitive agreements (Article 85 TFEU) and on the abuse of dominant position (Article 86 TFEU) as well as on state aid (Article 90 TFEU). Article 107 TFEU prohibits state aid that distorts competition in the internal market. Member States must notify the EC of planned state aid measures unless they fall under a general exemption, such as the "de minimis rule"[12]. The EC has the sole competence to decide on the legality of state aid.[13] The EC was also given authority to enforce the competition rules. The EC has strong investigative (incl. on-site monitoring)[14] and decision-making powers (e.g., recover incompatible state aid). Member states must follow notification procedures and aid measures need approval by the EC. To give guidance to member states of the European Union during the GFC, the EC published so-called Communications (details for the Communications concerning the state aids for banks can be viewed in Appendix C).

Concerning the potential sanctions, the DG COMP office, which processes and monitors all the state aid decisions for the EC, has powerful sanction mechanisms which can result – in the worst case – in a full payback of the state aid plus potential additional interest rates in cases of unlawful aid. Reimbursement of the state aid can be viewed as detrimental for banks in liquidity needs providing enough incentives to adhere to the EC's state aid rules and procedure. This ability to require repayment relies on the suspension and recovery injunctions which are in accordance with the second subparagraph of Article 93(2) of the Treaty.

[12] De Minimis state aid a ceiling of EUR 200,000 as the amount of de minimis aid that a single undertaking may receive per Member State over any period of three years. Link: https://ec.europa.eu/competition/state_aid/legislation/de_minimis_regulation_en.pdf (access date: 05.07.2019)

[13] The EC distinguishes between different categories of state aid. It differentiates primarily between the following item: Grants and tax exemptions, equity participation, soft loans and tax deferrals and guarantees.

[14] In 2011, Gazprom was raided by the EU during antitrust investigations. EU investigators raided Gazprom in ten different countries. This example shall highlight that the EU can and is able to run so-called "dawn raids" and conduct on-site monitoring; link: https://www.ft.com/content/43f9f24c-e92b-11e0-af7b-00144feab49a (access date: 29.04.2021)

The Commission represented by the DG COMP has also the right to obtain all necessary information that helps it to make a decision based on the information injunction and to restore state aid immediately. It can also adopt interim measures that are addressed to the concerned member state. Interim measures may take the form of information injunctions, suspension injunctions but also recovery injunctions. The information injunction includes EC's access to information which includes information provided by the MT.

Lastly, to underline the legal strength of the EC in the European institutional setting, it should be highlighted that according to Article 24 TFEU of the Procedural Regulation, interested parties (including firms and individuals)[15] can easily file complaints against an unlawful provision of state aid if necessary.[16] This may reduce the amount of misconduct, as firms and states are eyed by competitors and potential customers that insist on lawfully conducted state aid procedures. The recent case of Lufthansa showed that competitors were ready to refer to the EU General Court regarding the state aid approval in 2020.

If a member state fails to comply with a suspension injunction or a recovery injunction, the Commission is entitled, while carrying out the examination on the substance of the matter based on the information available, to refer the matter to the Court of Justice of the European Communities and apply for a declaration that the failure to comply constitutes a violation of the Treaty. The EC is aware of the risk of oversight capture at national levels and tries to apply rules equally to all countries as a supranational organization with imposing enough pressure to comply, but it also requires trustees to help to enforce and monitor its commitments, incl. "long-term behavioural commitments" (Brueckner and Hoehn [2010], p. 73) on a case-by-case basis.

2.2. Role of Monitoring Trustees

According to Brueckner and Hoehn [2010], competition authorities have to ensure compliance with the EU commitments on a firm-level case-by-case basis. Though other potential monitoring mechanisms, like self-reporting, could be used, the EC has increasingly used MTs to monitor compliance with the commitments. Especially in merger remedies, the

[15] An example of how companies may come under pressure for illegal state aid occurred when Germany's local savings bank had to abandon state guarantees which was lobbied for by competitors that did not obtain state aid, link: https://www.economist.com/finance-and-economics/2000/12/07/a-change-in-the-landescape (access date: 08.03.2020). Also, recently Ryanair complained recently about Lufthansa's state aid, calling it illegal and ready to challenge the bailout , link: https://www.irishtimes.com/business/transport-and-tourism/ryanair-to-challenge-lufthansa-s-9bn-aid-1.4262909 (access date: 27.09.2020)

[16] Here is the link to the State Aid Complaint form https://ec.europa.eu/competition/forms/intro_en.html where any private or legal person can file a complaint against alleged unlawful state aid.

appointment of MTs has become a common practice with almost every merger case decided by the EC to contain such an MT provision. This common practice, according to one of my interviewees, has been recently applied also to state aid cases of banks in the recent financial crisis to be able to enforce the commitments in a setting where the EC was faced a huge number of state aid cases (see figure 3) and where it needed to obtain additional expertise given the complexity of the financial sector. According to some anecdotal evidence, the implementation of MTs has proved to be a useful tool in state aid decisions.[17]

The EC uses MTs as its "eyes and ears" [18], some even say the EC uses them as a "cane" or baton. Although the EC has no legal act that grants it the power to establish such a monitoring mechanism, it can be part of its conditions set when state aid is approved (Brownsword et al. [2017]). As depicted in figure 1, the assignment of an MT usually results in a three-sided relationship between the bank that has received state aid, the EC's competition authority, and the MT. The MT supervises the actions by the mandated bank but also supports the banks with the implementation of the remedies. After the appointment of the MT, the EC will usually have a kick-off meeting with the MT to brief the MT on key issues of the specific case (Brueckner and Hoehn [2010]). The MT is usually a private consulting or auditing firm (Brownsword et al. [2017]), such as Mazars or Grant Thornton, because these firms have the necessary skill set to fulfill the required tasks. According to information from DG Comp[19], there is no standard procedure on the process of selection of the MT. What normally occurs is that either the bank or the member state proposes to the EC a shortlist of candidates which are then approved by the DG Comp. During this phase, the EC verifies that some fundamental elements like no conflict of interest, independence, competencies, etc. are ensured when choosing the MT. According to Brueckner and Hoehn [2010], the EC has a strong influence on the selection process and is keen to meet with the proposed MT candidates before the MT is mandated (Brueckner and Hoehn [2010]).

The MT is normally remunerated by the bank. I could not obtain any specific information on the salary level but, according to the EC, these are determined through market forces (e.g., call for bids of the proposed MTs on the shortlist) in each member state and can be

[17] On the 23.05.2019, I met Ulrich Puls (http://www.alcis-advisers.com/) to discuss the role of MT because his advisory company takes up MT roles. An informal interview with DG Comp employees on 13.01.2020 confirmed this information.

[18] The EC itself cannot be directly involved in overseeing the implementation of the commitments, hence a trustee is appointed to oversee the banks' compliance with the commitments; link: https://ec.europa.eu/competition/mergers/legislation/files_remedies/remedies_notice_en.pdf (access date: 16.02.2020)

[19] Information was received via e-mail correspondence on 29.01.2020.

compared to salaries based on billable hours at law firms with similar team sizes.[20] The budgets are set only preliminary, and it is only the EC that can request work that is done by the MT, not the supervised bank. Unfortunately, the names of the appointed MT are not always publicly available. Only via few available news articles, I could identify some MTs, such as Mazars.[21] According to one interviewee, however, the market for MTs in Europe seems rather narrow and comprises approx. less than ten key players that apply regularly for the MT mandates. Also, according to my interview partners[22], MTs cannot be compared to auditors because they are not chosen and mandated by the supervised firm. Hence, I abstain from making any further comparisons to auditors and links to the auditing literature.

As part of the tasks, the MT (see Appendix D) has to file reports at pre-determined times (as shown in figure 1), for example, once every three or six months, and send them to the DG Comp. Independence of the MT is crucial (Brueckner and Hoehn [2010]) and warranted because the MT that gets the mandate must adhere to extremely strict rules pre and post the mandate. For example, the MT has a long blackout period after the mandate where it cannot engage in other business activities with the monitored bank worldwide. Also, the history of business relations of the respective bank and MT will be checked to identify any possible conflict of interest. Hence, the MT's incentives are rather to please the DG Competition with good work to obtain follow-up referrals than to please the mandated bank[23]. In case of misconduct, the EC may also fire the MT in charge, blacklisted, and replace it with a new MT.[24] Objections against proposed candidates are not uncommon with reasons being the lack of expertise or lack of independence that is required to take up this mandate (Brueckner and Hoehn [2010]). The reports from the MT to the EC are generally not disclosed to the public. In case the MT discovers any misconduct, the MT will report this to the EC and the EC may take further action. The specific tasks and responsibilities of the MT are described in the MT mandate, which can vary across the mandate and time. The contract between the parties is not accessible to the public.

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[20] This information was obtained during one of my talks with MT Ulrich Puls.

[21] According to a Reuters new article, link: https://www.reuters.com/article/greece-banks-monitors/monitors-named-at-greek-banks- idUSL6N0ALADU20130116 (access date: 09.01.2020), KPMG monitored Pireaus Bank and Mazars monitored Alpha Bank.

[22] I asked Ulrich Puls during our interview whether MTs can be compared to auditors. He said not at all because they are not mandated by the monitored firm and they are only bound by the instructions they obtain from the EC. That is also why they have little incentives to please the monitored firm as they are not allowed to take up follow-up business according to their mandate.

[23] On the 23.05.2019, I met Ulrich Puls (http://www.alcis-advisers.com/) to discuss the role of MT because his advisory company takes up MT roles.

[24] In 2013, the EC sued a former MT of Microsoft (link: https://www.competitionpolicyinternational.com/eu-commission-sues-man-who-helped-authority-tackle-microsoft/ (access date: 16.02.2020)

A bank disclosed that "the Monitoring Trustee's powers affect management's discretion by imposing further supervision on the Bank" (Alpha Bank, Form 20-F in 2014)[25]. Currently, only the publicly available state aid decisions can give an idea of the MT's responsibilities and duties during the respective mandate. I have summarized these responsibilities in Appendix D to better understand the MT's duties and the MT's scope of work. Given the range of possible responsibilities and competencies and the fact that they may vary over the time of a mandate, I will quickly refer to the most important ones for the upcoming analyses. Apart from attending the meeting of the Managing Board, Credit Council as well as Credit Committee, the MT can assess projected operating results and agreed measures as well as agreed ratios. Additionally, the MT can assess the provisioning of non-performing loans, the recoverability of loans as well as the overall exposure to individual clients or credit portfolios. The MT can also propose corrective and improvement actions to the Board of Directors if necessary. MT may review the most significant loans regularly and interview all members of the relevant committees responsible.

To sum up this section, it seems that MTs have far-reaching rights. The fact that illegal state aid must be recovered even if the recovery of aid means that recipient companies go bankrupt[26], increases the pressure of state aid banks to comply with the MT as part of the commitments of the EC. Finally, it has to be highlighted that I cannot observe the potential varying duties on a case-by-case basis, and not all listed duties in Appendix D may apply to every bank in the sample which makes it difficult to formulate specific outcomes the MT may change. Given the potential of facing varying commitments on a case-by-case basis, it seems difficult for the bank to anticipate all of the MT's actions during the mandate as well as the chance to be assigned one MT. Here, access to the reports from the EC on an individual case basis would help to provide a better understanding and matching of the duties and the observed outcomes.

2.3. Banks and state aid

Many prior studies have generally focused on the differences between banks with and without government ownership (e.g., Altunbas, Evans, and Molyneux [2001], Sapienza [2004],

[25] The link to the file can be found here (access date: 13.04.2021): https://www.sec.gov/Archives/edgar/data/1096061/000104746915004829/a2224735z20-f.htm

[26] The aid to be recovered includes interest and is payable from the date on which the unlawful aid was at the disposal of the beneficiary until the date of its recovery. Link: https://ec.europa.eu/competition/state_aid/studies_reports/recovery.html (access data: 16.02.2020)

Micco, Panizza, and Yanez [2004], Iannotta, Nocera, and Andrea Sironi [2013], Duchin and Sosyura [2014]) with some older studies (e.g., Saunders, Strock, and Travlos [1990], Gorton and Rosen [1995], Houston and James [1995]) focusing on the effect of ownership concentration on risk-taking with no consensus on the sign of this economic relationship. A recent study by Duchin and Sosyura [2014] finds that bailed-out U.S. banks have initiated higher risk loans and have moved towards riskier assets. Another recent study that focuses on European banks (Iannotta et al. [2013]) finds that banks with a government stake have lower default risk, but higher operating risk compared to privately owned banks. Apart from risk-taking, Altunbas et al. [2001] find little evidence that privately owned banks are more efficient than government-owned banks. Similarly, Micco et al. [2004] find no significant differences in the return on assets in industrial countries.

A recent paper by Gerhardt and Vennet [2017] investigates the financial conditions of banks before and after they have received state aid from 2007-2013 in Europe. They find that saved banks hardly improve their operational performance indicators but keep their risk profiles and business models. Although Gerhardt and Vennet [2017] shortly mention possible "supervisory pressure" on page 29 of their paper, they do not explain what supervisory pressures they mean. Hence, they do not relate their findings to the MT and the monitoring, as well as to the specific institutional features of this setting. Similarly, Schaz [2019] mentions that by transferring control rights to the government, national politicians might have gained more influence without mentioning the existence of the active state aid rules and supervisory mechanisms, including the existence of MTs, in the EU. This study will fill this gap in the literature by providing a detailed analysis of the supervisory and monitoring mechanism introduced via the MTs after banks have received state aid in the EU.

2.4. Banks and enforcement

Apart from the prior literature on state aid and banks, recent literature has also examined the role of public enforcement on the stability of the banking system that uses cross-country settings to examine how mainly national bank supervisors shape the stability and the financial reporting properties of banking systems (e.g., Bischof et al. [2020a], Bushman and Williams [2012]). This line of literature has provided several key takeaways: First, firms generally appear to differ to which extent they comply with specific disclosure requirements (e.g., Glaum and Street [2003]). Public enforcement of existing rules is an important determinant to explain these differences across countries and firms (e.g., Brown, Preiato, and Tarca [2014]). Second, related to the first point are the economic resources of the regulator itself that impact the possibility to pursue individual cases of malpractice (Jackson and Roe [2009], Christensen, Hail, and Leuz [2016]). Third, supervisory agency's willingness to practice forbearance may be hampered when the survival of the bank is largely at the supervisor's discretion (e.g., Brown and Dinç [2005], Gallemore [2020]) and the supervisors may follow their own private benefits (e.g., potential future employment opportunities) (e.g., Costello et al. [2016]). Fourth, potential "turf fights" between different responsible regulators may occur leading to regulatory competition among supervisory bodies (Tiebout [1956], Danielsson [2013]).

Focusing primarily on national or regional supervisors and regulators in prior literature, little attention has been paid to the supranational monitoring mechanisms that banks obtained with their state aid commitments during the financial crisis. This study aims to provide an understanding of these newly implemented MTs and how they may change banks reporting behavior and financial reporting transparency.

2.5. Banks and transparency

I view transparency not primarily as a state in which firms can be but merely as an outcome, closely defined as the availability of bank-specific, value-relevant information available to external stakeholders (like Guo et al. [2020]). I am also aware that the transparency of banks is a concept that has been difficult to measure (Nier [2005]) and that it has been measured differently in prior literature often trying to capture several features (e.g., disclosures, discretionary accruals, restatements) that are linked to the market's ability to monitor banks and to engage in market discipline.

Regarding the MTs, I think, there are two major channels through which an MT may influence a bank's financial reporting transparency. Firstly, MTs can influence the information generating of bank managers and the bank's internal information processes by demanding more and/or better information regarding certain issues, such as loan impairments. When bank managers are forced to produce more and/or higher quality internal information, this information should manifest itself in some external reporting if we believe the proposition made by Verrecchia [1990] which implies that the market will exert pressure on the manager to disclose the higher quality piece of information.[27] In principle, it appears reasonable that better information should improve monitoring, reduce risk, and potentially also increase profitability (e.g., Nier und Baumann 2006). On the contrary, one could argue that even if monitoring improves some dimensions of bank internal information it might not affect external reporting as market participants may not be aware of the MT's activity and hence, cannot exert the pressure that is required to fulfill Verrecchia's proposition. However, this concern shall be a minor one as shareholders can obtain the information whether the bank was assigned an MT either through the firm disclosures or via contacting the EC. Over-reliance on the MT's presence may also lead to delegated monitoring (Diamond [1996]) and no increase in external reporting may be the result.

Secondly, one can also argue that the MT's major objective may not be to assess the bank's financial reporting. However, the recent EC's requests for more disclosures on foreseeable losses may go against this point. As the EC asked for more foreseeable losses to be disclosed, it may be using the implementation of MTs to increase market discipline and helping the market to monitor the banks. Prior literature, however, hints to potential forbearance strategies on the national level (e.g., Huizinga and Laeven [2012], Gallemore 2020]) that may also take place on the supranational level incl. incentives to allow banks to obtain time to "go dark" and recover under state aid (e.g., Agarwal et al. [2014]) during crises. Hence, one would not expect to see a change in the financial reporting transparency of banks. Prior findings that could weaken this argument suggest that the regulator's reputation can be potentially damaged by forbearing on a bank and that engaging in forbearance may be suboptimal for regulators with a strong reputation. Morrison and White [2013]) mention related to this point the anecdotal evidence that the UK regulator was in "fear of falling foul of EU rules on State Aid" (p. 654)

[27] To allow market participants to monitor and discipline banks excessive risk-taking, the so-called process of market discipline in prior banking literature (e.g., Bushman and Williams [2012]) means public access to available timely, consistent, and reliable information on the financial performance of banks and risk exposures are necessary (e.g., Stephanou [2010]).

in the past and avoided engaging in secretly supporting Northern Rock during the last financial crises in 2007. Engaging in secret forbearance strategies can never be fully ruled out (Gallemore [2020]) because they are difficult to observe. The setting in the EU seem to provide, however, strong incentives as described above to adhere to the EU rules on State Aid (incl. retroactive action against illegal state aid, repayment of the state aid including interest, lawsuits against the bank, reputational damage, etc.) reducing the incentives to engage in forbearance strategies.

As an alternative explanation, one could also assume that banks with MT try to raise capital, probably debt, to aim to get rid of these new additional supervisors and therefore become more transparent to attract new external capital. In the sample, nonetheless, I can only identify a small subsample of thirteen banks that engaged in recapitalizations (mainly fixed income) out of which eight had MTs. In the further analyses, due to the small sample size, this subsample is not considered further.

3. Data and Research Design

3.1. Data collection

I start with a sample of 122 identified banks that have received state aid during the last financial crisis in the EU from 2005 to 2019. I have hand-collected the data on the banks with state aid cases using the data on all authorized state aid which can be found on the ISEF registry of the European Commission.[28] Since in some cases only aggregated state aid schemes are mentioned without referring to the specific banks, the database cannot be used to identify all individual banks.[29] To identify all banks with state aid, banks were checked individually for the receipt of state aid (see more details in Appendix B), using company information and a Google news search. Prior research (e.g., Gerhardt and Vennet [2017], figure 2)[30] and other reports, such as the CEPS Task Force on Bank State Aid, have been consulted to identify banks.[31] Also, prior research (e.g., Gerhardt and Vennet [2017], Schaz [2019]) was consulted to compare the different sample sizes. Similar to Gerhardt and Vennet [2017], I only focused on parent companies because state aid is passed on the level of the parent company and it prevents double-accounting. As many banks have benefited from several aid measures at different points in time, like ING (2008: capital injection, 2009: bond guarantee), the banks are defined as receiving government support with the first public announcement of receiving financial support (ING is included as a bank receiving state aid in 2008). State aid was classified into four different types, namely recapitalization, guarantees, asset relief measures, and liquidity assistance, as can be seen in table 2 panel D. Start and end dates are drawn from the state aid cases and company information.[32] In case of unknown end dates, the state aid is assumed to continue, and it will take value one for the full sample period (see for further details figure 2).

[28] For further details see link: http://ec.europa.eu/competition/publications/cpb/2016/2016_004_en.pdf (access date: 20.03.2019)

[29] All state aid cases that have been the object of the EC's decision since 1st of January 2000 are obtained in that database. Detailed information on each of the case includes the following item displayed on the following link http://ec.europa.eu/competition/state_aid/register/user_guide.html (access date: 02.04.2019).

[30] In a period from 2007-2013, Gerhardt and Vennet [2017] came up with 114 state aid banks without providing the exact list of banks they could identify. Those banks include banks with government interventions on the asset and liability side like in my sample.

[31] Documents like the CEPS task force report were also used to identify banks with state aid, link: https://www.ceps.eu/ceps-publications/bank-state-aid-financial-crisis-fragmentation-or-level-playing-field/ (access date: 15.08.2020).

[32] Repayment data is difficult to identify for various reasons (usually contractual reasons): the bank "repays" the state (i.e., for instance refunds a loan or an equity injection) because this strictly speaking might not qualify as "State aid repayment" from a legal perspective (the initial advantage received by the bank is not necessarily neutralized) but might be considered as "repayment" from an economic perspective (i.e., for the state). Missing Commission decision about such repayment make it even more difficult.

All other financial data was retrieved from CapitalIQ and company filings. Here, it must be noted that the data from CapitalIQ comes from the original filings and not the restated numbers that can also be retrieved from CapitalIQ. Banks with missing gross loans and total assets were dropped. For exact definitions of the variables used, see Appendix A. The unit of observation is based on bank-year level as quarterly observations are scarce in early years and would have deleted many banks due to missing quarterly data. The dataset with the banks that obtained monitoring trustees came from the DG Comp and was obtained in 2019. The country-specific characteristics on governance indicators comprise mainly the World Bank variables, such as the regulatory quality index, the rule of law index, the control of corruption index, the government effectiveness index, the changes in the unemployment and GDP growth rates (see Appendix A). These governance indicators reflect the views of many firms, citizens, and experts.

For the subsample analyses of the listed banks and their credit risk disclosure score, I collected data from annual reports categorized them as described in Appendix F and G to obtain a credit risk disclosure score like Nier's [2005] work where a transparency measure was created based on how much information was provided in its annual accounts.[33]

For further subsample analyses, I also collected information on whether the banks with MTs disclose having them. I used public company information, such as annual reports or press releases, to identify in total 20 banks that disclosed having MTs.

3.2. Research design

Before investigating the financial reporting transparency of the banks, I explore the sample composition across countries and analyze in table 2 how these two groups of banks differ based on observable characteristics, including state aid characteristics, firm characteristics but also country-specific measures of governance indicators. Since the EC has not released any specific information regarding the criteria that can trigger the assignments of an MT for banks with state aid, I analyze in table 3 observable selection criteria based on country- and firm-specific attributes that may influence whether an MT is assigned or not to better understand the first stage of being assigned an MT. It is important to understand whether banks can anticipate the assignment of an MT because they may engage in costly avoidance strategies and behaviors, including changing pre-treatment outcomes. The anticipation would

[33] All annual reports were collected manually and saved separately. The annual reports do not show up in the references but are available upon requests.

influence the outcomes even before the actual influence of the MT starts. We can observe that only from 2011 onwards in most state aid cases an MT has been assigned but in 2019 the number of state cases as well as the percentage of MTs assigned dropped again. Also, across countries, the percentage of banks with MTs is varying with for example 100% in Slovenia and only 40% in Germany (table 1, panel B). Moreover, given the cases vary from bank to bank, it might be difficult for bank managers to anticipate whether they will also be assigned an MT or not. Additionally, the mandate itself may change over time for each bank during the time of the state aid case, and hence it may be difficult for bank managers to anticipate the MT's action during the mandate.

The main part of the study centers around analyzing any potential influence of the MT on the banks' financial reporting transparency. Transparency is less a state in this study, but more an outcome which as indicated by prior research (e.g., Nier [2005]) is a concept that is difficult to measure and operationalize. To evaluate whether there are any potential changes in transparency with the introduction of the MT, I use three major perspectives. First, I analyze banks' loan loss reporting behavior using panel regressions with different key ratios from banks' yearly financial statements as the dependent variables. The key ratios include the loan loss provision ratio, the loan loss allowance ratio as well as the non-performing loans ratio (like Bischof et al. [2020b]). Second, I examine whether financial restatements (like in Jiang, Levine, and Lin [2016], Costello et al. [2016], Gallemore [2020]) change with the introduction of the MT. Here, I account for restatements that were classified by CapitalIQ as restatements with financial results that are fundamentally different from the previous numbers. Lastly, for a subsample of listed banks, I examine whether the credit risk disclosures increase like an approach by Bischof et al. [2020a] and Nier [2005] who bases a measure of transparency on how much information a bank provides on its risk profile in its annual accounts.

The identification strategy relies on the fact that I can observe European banks with and without MTs that have received state aid (see figure 2). The research design exploits the fact that the banks obtained state aid at different points in time from 2005 to 2019 with some banks being assigned an MT and others not (with no standard procedure for the process of the selection of the MT as according to the DG Comp). The staggered adoption may allow for a better identification as it is unlikely that unrelated shocks line up in time with the MT introduction pattern across the respective EU countries or rule out unobserved consistent differences between the groups (Barrios [2021]). Also, this design allows for yearly fixed effects which help to control for general time trends and market-wide shocks in reporting behavior (e.g.,

Christensen et al. [2016]). Cofounding events would need to be correlated with these different dates of the MT introduction, which seems unlikely. Additionally, given the absence of a standard procedure for the process of the selection of the MT and the potential uncertainty and timing on the state aid procedure, it seems not highly likely that state aid banks can fully anticipate the overall commitments they have to comply with including a potential assignment of an MT.

To analyze the MT impact on reporting behavior of banks, I estimate variations of the following ordinary least squares regression model for a panel of treatment and benchmark firms over the 2003 to 2018 period[34]:

$$\textit{Loan loss reporting ratios}_{i,t} = \beta_0 + \beta_1\, \textit{Time}_{,t} + \beta_2\, \textit{Monitoring Trustee}_{i,t} + \beta_3\, \textit{Monitroing Trustee} * \textit{Time}_{i,t} + \Sigma\, \beta_i\, \textit{Controls}_{i,}t + \Sigma\, \beta_j\, \textit{Fixed Effects}_j + \varepsilon_{i,t} \quad (1)$$

As the main dependent variables in table 4, I use three different key accounting ratios: the loan loss provisions to total gross loans (*LLP ratio*), the ratio of total loan loss allowance to total gross loans (*LLA ratio*), and the ratio of non-performing loans to total gross loans (*NPL ratio*). The coefficient associated with the Monitoring Trustee*Time interaction term captures the change in the dependent variable in the treated group relative to the control group. $\textit{Controls}_{i,t}$ denotes the following set of firm-level and macroeconomic control variables: Controls include *size* as the natural logarithm of total assets, the proportion of commercial and industrial loans *(% of consumer loans*), consumer loans *(% of commercial loans*), and real estate loans *(% of real estate loans*). I also controlled for further control for the bank-level variables that reflect the discretionary variations in LLP (similar to Guo et al. [2020]), such as *RoA* is the ratio of pre-provisioning income to total assets measuring of banks' profitability, the *Tier 1 ratio* is the ratio of banks' tier 1 capital to risk-weighted assets. *Loss* is an indicator variable capturing a previous negative net income and *risk-weighted assets* is the ratio of risk-weighted assets to total assets as a measure of the underlying portfolio risk. Time-varying macroeconomic variables that are accounted for are the change in GDP ($\triangle GDP$) as captured as the annual gross domestic product growth rate in the respective country obtained from the EU. The regulatory quality of the national regulator is accounted for by using time-varying data from the World Bank. Since the *regulatory quality index* is also the main variable of the observable country variables that remain significantly connected to the assignment of MTs in table 3, it is added as

[34] Similar to Balakrishnan and Ertan [2018], the whole difference-in-differences (DID) specification is mapped out including the fixed effects, which in some specifications will not allow to estimate the β_2 Monitoring $\text{Trustee}_{i,t}$ when bank fixed effects are present. β0 would also not be estimated when fixed effects are switched on in a

a control variable in the main specification. For the specification, the key assumption that any unmeasured determinants of the outcomes are either time-invariant or group-invariant still holds here, (Wing, Simon, and Bello-Gomez [2018]): Year- and firm-fixed effects are included to account for unobserved heterogeneity on the year or bank level. This structure tries to subsume factors that are specific to a certain year (e.g., the sovereign debt crisis) as well as all time-invariant country and firm characteristics (e.g., the quality of the legal system or the development of capital markets). The standard errors are clustered by banks to control for time-series correlations (Petersen [2009]). I also control for the *asset relief measure* program, capture by a binary indicator variable, to control for a potential impact on the key ratios due to potential changes in the loan portfolio.[35]In a subsample analysis, I investigate whether the 20 banks that are disclosing the presence of the MT drive the results.

In the second part, I follow Jiang et al. [2016] and look at financial restatements. Restatements are motivated by prior literature (e.g., Rusticus and Ng [2011], Jiang et al. [2016]) by assuming that more restatements are associated with a higher likelihood of bank failures. Banks with more restatements may be more difficult to monitor and be indicative of weaker internal control systems (Doyle, Ge, and McVay [2007]). However, one could also argue that an increase in restatements in the presence of the MT may help to convey the true financial conditions to the market and thereby increase transparency. Due to data availability, I cannot look at restatements that were triggered by the regulator's comment letter or any other regulators' enforcement actions, but I take indicators of restatements from CapitalIQ where the financial results were fundamentally different from the original.[36] Based on that data, I cannot say, whether the banks have restated their numbers either intentionally or unintentionally because any of the restatements I observe can represent a mistake or a fraudulent action. Since I cannot intentional and unintentional errors, I may have to refrain from stating the restatements reflect an attempt to manipulate the disclosed information. This goes against those who argue that restatements are a violation of appropriate accounting practices by managers and are, therefore, a measure of how management discloses information to the public. Nevertheless, interpreting the results may remain ambiguous because more frequent restatements could reduce accounting errors and indicate an increase of financial reporting transparency (e.g., Costello et al. [2016]) in the future, although some argue (Jiang et al. [2016]) that more frequent

[35] Prior findings by Gerhardt and Vennet [2017] find that rescued banks hardly improve their performance but maintain instead their old business models and risk profiles.

[36] According to CapitalIQ restatements were classified as fundamental net income, retained earnings and/or cash from operations were different

restatements could indicate an opaquer bank. The model specification includes varying dependent variables that account in columns (2) to (4) for restatements linked to the income statement, balance sheet, and cash flow statement only. The control variables follow the specification of Jiang et al. [2016]) and include size, the capital ratio, the lag value of the LLP ratio, and the loss indicator.

In the third part, I construct a credit risk disclosure measure following Bischof et al. [2020b] and Nier [2005] with hand-collected data points for the subsample of listed banks. The idea here is to operationalize financial reporting transparency by a measure that captures how much information a bank has provided on its risk profile in its annual accounts and to see whether banks with MTs are more compliant with credit risk disclosure. The focus on credit risk was chosen deliberately because of the generally accepted importance of credit risk as one of the key risks to be managed by banks[37]: weak credit risk management practices and poor credit quality can increase the likelihood of bank failures. Given the MTs' potential say on credit risk policies, I would also contend that the focus on credit risk may be the best first choice to investigate. One may argue that an increase in transparency is not the same as an increase in disclosures. However, transparency has usually been a concept that is difficult to measure (Nier [2005]) and many regulators, like the EC, have requested more disclosures to help market discipline and thereby increase transparency. Hence, I wanted to add important disclosures, too, in my analyses. Such a measure can only capture hard, quantifiable information and it may neglect all the information provided through other information channels. It is only based on an unweighted sum and may neglect any relative importance of the various components that build the score. Moreover, the biggest issue from my point of view is that the score does not capture any voluntary disclosure points; only compliance with mandatory disclosures is captured currently. Details on the construction of the credit risk disclosure score and a coding example can be found in Appendix F-G.

[37] An example that stressed the importance of credit risk was made earlier by a Basel Committee on Banking Supervision (BCBS) best practice paper: “Experience from around the world indicates that poor credit quality coupled with weak credit risk management practices continues to be a dominant factor in bank failures and banking crises. Therefore, information on banks’ credit risk profiles, including the quality of their credit exposures and the adequacy of their credit risk management processes, is crucial in market participants’ and supervisors’ assessment of their condition, performance and ability to survive in the long run. Such information is also important in assessments of the overall safety and soundness in banking systems” (BCBS 1999, p. 24).

4. Empirical Results

First, after explaining the sample construction in table 1 panel A, I investigate how the banks in the sample are distributed across countries. According to table 1 panel B, countries with the overall highest amount of state aid banks are Spain (12% of the total sample), Italy (11% of the total sample), Germany, and Denmark (both 8% of the total sample). The countries with the highest percentage of banks with monitoring trustees relative to the banks with state aid are Slovenia (100%), Belgium (100%), Latvia (100%), Bulgaria (100%), Spain (87%) as well as Portugal (83%). Germany and Denmark, although having many state aid banks, have covered only 40% of banks with monitoring trustees. For the remaining banks in the sample, the top five countries are Germany (12%), Denmark (10%) and Italy (10%), Greece (9%) and Austria (8%), with Latvia, Luxembourg, Malta, and Romania dropping out of the sample as countries. The overall distribution of bank state aid cases is distributed not evenly as shown in figure 3, with most of the cases accumulating in the year 2008 (23 cases), 2009 (27 cases), 2011 (15 cases), and 2012 (12 cases), which is in line with the anecdotal evidence that the EC had to face an unprecedented boom in state aid cases with also varying commitments across cases and time.

Then, I continue my investigation by comparing on a univariate basis state aid banks with and without monitoring trustees in the years before the global financial crises and the first state aid cases. As the first state aid case was recorded in 2005, I compare the two different groups of banks in the pre-crisis years 2004 and 2003 which is reported in table 2 for the remaining 76 (out of 122 identified banks in table 1 panel A) banks. Table 2 panel A presents the descriptive statistics for the most important variables used in the analyses. The dependent variables of interest, the LLP ratio, the LLA ratio, the NPL ratio as well as the indicator for the overall financial restatements show no statistically significant differences in the pre-crisis years. Interestingly, other variables such as size, the tier 1 ratio, the return on assets, the operating margin, the loss indicator as well as risk-weighted assets show no significant difference for both treatment and control groups, too. The differences in country-level variables (changes in GDP and unemployment) are not statistically different from each other in both groups before the crisis. The only variable out of the governance indicators that seems to be statistically significantly different is the regulatory quality index, which captures the perceptions of the ability of the government to implement policies and regulations that permit and promote private sector development. Here, banks with MTs tend to be located in countries with a lower regulatory quality as defined by the World Bank compared to banks without MTs

(approximately -0.11 points difference in the index). Banks with MTs are also located in countries with a lower rule of law index, a lower control of corruption index, and a lower government effectiveness index, though the differences are not statistically significant. This may suggest that MTs are more often requested and placed in countries with a weaker national regulatory environment. Additionally, the state aid banks with MTs had significantly fewer Big4 auditors, though this difference becomes non-significant in later years. Furthermore, the ratio of commercial loans to total loans was also significantly higher for banks with MTs (approximately 12%). For this ratio, though, it needs to be considered that CapitalIQ only provides the loans that are related to the working capital of commercial customers and not the total commercial loans provided as provided by other databases (e.g., Bankscope).

As indicated in table 2 panel B, the differences between banks with and without MTs throughout 2003-2018 seem to change for some variables. Banks with monitoring trustees seem to become smaller in size with a mean log value of Euros 10.8 billion in total assets (like Gerhardt and Vennet [2017]) and have a lower disclosed tier 1 ratio with a mean value of approximately 9.6%. The two groups also seem to differ in their loan portfolios considering MT banks having more commercial loans than consumer loans. The downsizing in real estate loans and consumer loans may be linked to changes in the loan portfolio linked triggered by the commitments related to the state aid, which is support by findings in panel D, where banks with MTs are more likely to also face asset relief measures that may change the underlying loan portfolio of the bank. With regards to the return of assets and the risk-weighted assets, the differences between MT banks and non-MT banks are not significantly different. State aid banks with MT are also not more like to be loss-making, which is in line with findings by Gerhardt and Vennet [2017] who claim that state aid banks hardly have improved their performance but have maintained instead their old business models. Banks with MTs also have a higher LLP ratio and a significantly higher LLA ratio but a lower disclosed NPL ratio and lower charge-off ratio in the univariate comparison. Comparing the results to other findings in prior literature must be done with caution as different variable definitions (Gerhardt and Vennet [2017]) and different filings choices (not disclosed whether restated or original filings are used) (e.g., in Bischof et al. [2020a]) make comparisons of results rather difficult if not impossible.

Concerning the country level measures, MT banks remain more likely to be based in countries that have a significantly lower regulatory quality index, lower rule of law index, lower control of corruption index, and a lower government effectiveness index as shown in table 3 panel C. According to table 3 panel D, banks with MTs are also more likely to have a longer

duration of state aid (on average 7.5 years) and usually more recapitalizations, guarantees, and asset relief measures. They are also more likely to still have ongoing state aid commitments. These observations may imply that banks with MTs face generally more commitments and/or more complicated state aid cases of longer periods. The EC may consider that these commitments are too complex and not easy to monitor directly by the EC.

Table 3 aims to further analyze what observable criteria based on country-specific and firm-specific attributes are linked to obtaining or not obtaining an MT. After controlling for country and year fixed effects, the only country-specific attribute that still matters is the regulatory quality index, which is in line with the findings in table 2 panel b and panel c. Regarding the firm-specific attributes, the state aid-specific attributes, like the asset relief measure, the guarantees, and the recapitalization seem to matter after controlling for year and bank-specific fixed effects, which is in line with findings in table 2 suggesting that banks with MT may face more complicated commitments, including asset relief measures.

Table 4 summarizes the main results on the loan loss reporting behavior of banks for the three key dependent variables. The estimation results are based on ordinary least squares regression specification in a staggered difference in differences design for a panel of MT banks and non-MT banks firms over the 2003 to 2018 period and 1,049 bank years. The impact may vary with the difference in the presence of the MTs that enter the bank as additional supervisors. Note also that it is assumed that the MT is immediately implemented after the state aid decision is made and (as described in figure 2) it is assumed that the MT does not switch back to zero once the state aid stops for the baseline analyses shown in table 3 (MT remains in the bank).[38] These are strong assumptions as the implementation may take longer and the MT may not have any impact on the banks reporting behavior after the mandate ends. Furthermore, a strong underlying assumption for a causal interpretation of the results provided in table 4 (but also table 5) requires that the banks cannot anticipate the assignment of an MT. Any anticipation effects will bias the results[39]. From the information provided on the setting, it is difficult to say whether a bank can foresee the assignment of an MT. On one hand, having a more complicated case or being in a low regulatory quality country may make the assignment of an MT more likely. On the other hand, given the possibility of changes during the mandate, one may argue that banks may have difficulty forecasting the MT's behavior during the mandate.

[38] According to Brueckner and Hoehn [2010], MT are implemented in merger cases approximately two weeks after the commitment is installed.
[39] Neglecting these anticipation effects often leads to an underestimation of the treatment effect.

The MT's presence in a bank seems to be linked to the bank's loan loss reporting by increasing the LLA ratio when the original filings are considered. However, no link to the other two key variables is observable when the original filings are used. After using data based on the original filings, there is no increase in the LLP observable, which would be indicative of timelier loan loss provisioning. On average, the baseline effect for the loan loss provisions and the non-performing loans remains insignificant after accounting for determinants for discretionary and non-discretionary loan loss reporting items as in Bischof et al. [2020] and after accounting for bank and year fixed effects. Only the coefficients for the loan loss allowance ratio are statistically significant and economically meaningful with a 2.0 percentage points increase compared to the estimated effect sizes by Bischof et al. [2020b] where loan loss allowances decrease by 0.2 percentage points upon the Single Supervisory Mechanism (SSM) adoption.[40] This result even holds after controlling for the asset relief measure programs which should account for a change in the underlying loan portfolio of the bank that may be induced by the MT. Under various specifications, the evidence on loan loss reporting seems to indicate that these banks adapted to the newly introduced monitoring with an increase in disclosed loan loss allowances.[41]

Concerning the restatements of financial statements, banks with an MT seem, on average, not more likely to engage in restatements as reported in table 5 column (1). However, once the dependent variable is split into different restatements, like restatements in income statements, balance sheets, or cash flow statements, one observes that restatements regarding the income statement and cash flow statement can become more likely for banks with an MT which is in line with the described MT's "powers [to] affect management's discretion by imposing further supervision on the Bank"[42]. As in Jiang et al. [2016], more frequent restatements would indicate a negative signal about the disclosure quality of the firm but higher restatements, as discussed by Costello et al. [2016], may also reduce accounting errors in the future that impair financial accounting transparency and potentially the likelihood of future restatements, which may improve the reporting quality.

[40] Comparing results to Bischof et al. [2020b] is difficult and has to be done with caution because it is not clear whether the researchers have used original filings or restated numbers from CapitalIQ.

[41] I am aware of recent discussions on the potential biases in staggered DiD design and the role of heterogeneous treatment affects when using as two-way fixed effect regression; but due to a limited sample size I have not adjusted for it via a stacked regression design (Barrios [2021]).

[42] This quote comes from Alpha Bank, Form 20-F, p.24, link: https://www.sec.gov/Archives/edgar/data/1096061/000104746915004829/a2224735z20-f.htm (access date: 13.04.2021)

For the subsample of listed banks in table 6, MT banks do not have significantly more compulsory fulfillment of credit risk disclosures than the banks without MTs in a univariate comparison. However, it needs to be considered that in the setting the separate the effect of the MT is difficult to identify because compliance with the new IFRS 7 and Pillar 3 disclosures occurred at the same time as most of the listed banks received MTs in the analyzed subsample. Also, any differences in voluntary disclosures are not captured by the score. Interestingly, the listed banks that disclose the presence of the MT in their annual reports, have significantly lower credit risk disclosure scores than the banks with MT that do not disclose it.[43]

Additionally, I conduct another subsample analysis based on the 20 disclosing MT banks (public and private) to investigate which group of MT banks might drive the results in table 4 and table 5: First, I compare banks with MTs in a univariate comparison (not tabulated) who disclose having MTs and banks not disclosing having MTs. When looking at the key outcome variables, the loan loss allowance ratio is significantly larger for disclosing banks. In Appendix H, I redo the analysis in table 4 and table 5, to see which group of MT banks might be driving the results. The results only hold for the banks that disclose having an MT (see Appendix H).

[43] Due to the small sample size further, multivariate tests are not conducted.

5. Conclusion

This paper is the first one to examine what duties the newly implemented supranational monitoring trustees have in their assigned banks, and whether they may have an impact on the financial reporting transparency, more particularly on the loan loss reporting behavior, the financial restatements, and the credit risk disclosures of banks. I exploit a setting where these monitors are implemented at some state aid banks at varying points in time across banks in the EU to provide additional supervision. To the best of my knowledge, my study is the first to explore these supervisors in banks in detail and that investigates the relationship between the monitoring trustees and the banks' financial transparency, as prior literature has mainly focused on the impact of national regulators and supervisors (e.g., Bushman and Williams [2012], Costello et al. [2019]). Moreover, some academics (e.g., Gerhardt and Vennet [2017], Schaz [2019]) have been silent about the role of supranational regulators and monitors when studying state aid in the European setting. My findings suggest that the MTs' presence is be connected to changes in loan loss reporting and other reporting behavior, such as restatements, through their power to curtail management's discretion.

Concluding, my findings present the first empirical insights into these new supranational monitors. In the aftermath of the last financial crisis, external stakeholders have been seeking additional governance mechanisms to encourage bank managers to establish adequate reserves and provide better disclosures, thus leading to a more stable and healthier banking system. To what extent these new supernational supervisors also lead to a more transparent and stable banking system, remains to be seen, as I am not capturing transparency as a state but rather as a reporting outcome. Nevertheless, these the findings should be of interest to regulators, researchers, and, most importantly, the policymakers at the EC, as my findings contribute to the lively debate on the extent to which additional strong monitoring mechanisms should be implemented to foster financial stability. Interestingly, a recent paper (Rixi [2015]) has also asked to learn more about the EC's experiences made with the assignment of MTs. I also call for future research to examine more closely the detailed effects of MTs on banks' financial reporting decisions and other operating outcomes, and changes related to the MT's presence across other industries, too. Here, access to the EC's proprietary information would be of great help to better map the firm-specific commitments to the related outcomes.

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Appendix

Appendix A: Variable Definitions

Variable	*Definition and Source*
Firm-level variables	
Monitoring Trustee	Binary treatment indicator variable that takes on the value of one whether the bank received a monitoring trustee (MT) during its state aid commitments and zero otherwise. It is assumed in the base case that the MT is implemented immediately with the announcement of the state aid decision. In the baseline analyses, it is assumed that the Monitoring Trustee does not switch back to zero, i.e., leaves the bank. For more details on the data collection see Appendix B; *data source: European Commission (provided a list of Monitoring Trustees)*
Time	Binary treatment indicator variable that takes on the value of one beginning in the first year that the bank becomes subject to the state aid whether the bank has received it and zero otherwise; *data source: European Commission*
LLP ratio	Loan loss provisions (IQ_LL) / total gross loans (IQ_GROSS_LOANS); *data source: CapitalIQ based on original filings or Company Data*
NPL ratio	Non-performing loans (IQ_NON_PERFORMING_LOANS) / total gross loans (IQ_GROSS_LOANS); *data source: CapitalIQ based on original filings or Company Data*
LLA ratio	Loan loss allowance (IQ_ALLOW_LL) / total gross loans (IQ_GROSS_LOANS); *data source: CapitalIQ based on original filings or Company Data*
Restatement	Indicator variable that represents the incidence of financial restatement (balance sheet, income statement, and cash flow statement (IQ_Restatement_BS, IQ_Restatement_IS, IQ_Restatement_CF) which equals one if the restatement code equals "RS" which indicate fundamentally different results from original in year t and zero otherwise; *data source: CapitalIQ based on original filings or Company Data*
Size	Ln (total assets (IQ_TOTAL_ASSETS)); *data source: CapitalIQ based on original filings or Company Data*
Charge-off ratio	Gross charge-offs represent the total of gross loans charged-off by the bank during the year when management determines that it is probable that the repayment of the principal amount of a loan will not be made in accordance with the terms of the loan; charge-off ratio (IQ_CHARGE_OFFS_GROSS / total gross loans (IQ_GROSS_LOANS); *data source: CapitalIQ based on original filings or Company Data*

Consumer loans ratio	Consumer loans (IQ_CONSUMER_LOANS_TOTAL_LOANS) / total gross loans (IQ_GROSS_LOANS); data source: CapitalIQ or Company Data
Commercial loans ratio	Commercial loans (IQ_COMMERCIAL_LOANS_TOTAL_LOANS) / total gross loans (IQ_GROSS_LOANS); include commercial enterprises, or joint venture, usually short-term, as a source of working capital not backed by a mortgage security divided by the amount of total loans; *data source: CapitalIQ based on original filings or Company Data*
Real estate loan ratio	Real estate loans (IQ_TOTAL_RE_LOANS_TOTAL_LOANS)/ total gross loans (IQ_GROSS_LOANS); *data source: CapitalIQ based on original filings or Company Data*
Tier 1 ratio	Tier 1 capital ratio % represents Tier 1 capital as a percentage of total risk-weighted assets of the bank (IQ_TIER_ONE_RATIO); *data source: CapitalIQ based on original filings or Company Data*
RoA	(EBIT) / ((total assets (t) + total assets (t-1)) / 2) via IQ_RETURN_ASSETS; *data source: CapitalIQ based on original filings or Company Data*
Loss	Binary indicator variable that equals one if net income (IQ_NI) is negative, and zero otherwise; data source: CapitalIQ based on original filings or Company Data
Risk-weighted assets	Risk-weighted assets (IQ_RISK_ADJ_BANK_ASSETS) / total assets (IQ_TOTAL_ASSETS); *data source: CapitalIQ based on original filings or Company Data*
Big4	Binary indicator variable of one if the Big4 Auditor (PWC, E&Y, Deloitte or KPMG) audits the company and zero otherwise, identified via IQ_AUDITOR_NAME; *data source: CapitalIQ based on original filings or Company Data*
Capital ratio	Book value of equity over total assets; *data source: CapitalIQ based on original filings or Company Data*
Asset growth	The yearly growth rate of total assets (IQ_TOTAL_ASSETS); *data source: CapitalIQ based on original filings or Company Data*
Analysts	Analyst coverage estimated via (IQ_EST_NUM_NO_OPINION); *data source: CapitalIQ based on original filings or Company Data*
Disclosure score	Credit risk disclosure score, see Appendix F-G for details; *data source: Company Data*

State aid characteristics	
On-going state aid	Indicator variable of one whether the state aid is ongoing and zero otherwise. I searched (via company webpage and a google search) for each bank with state aid whether they announced the end of the state aid or not; words used were “state aid” and “repay”, “end”, “terminates”, “return”, “reimburse”, “redeem”; *data source: company information*

Recapitalization	Indicator variable of one whether the state aid included a recapitalization and zero otherwise; *data source: European Commission and company information*
Guarantees	Indicator variable of one whether the state aid included guarantees and zero otherwise; *data source: European Commission and company information*
Asset relief measure	Indicator variable of one whether the state aid included an asset relief measure and zero otherwise; *data source: European Commission and company information*
Liquidity assistance	Indicator variable of one whether the state aid included liquidity assistance and zero otherwise; *data source: European Commission and company information*
Duration	Years of state aid of a bank calculated as the difference of the year the first state aid package per bank get announced and the announced repayment or the difference between the first year and 2018; *data source: European Commission and company information*

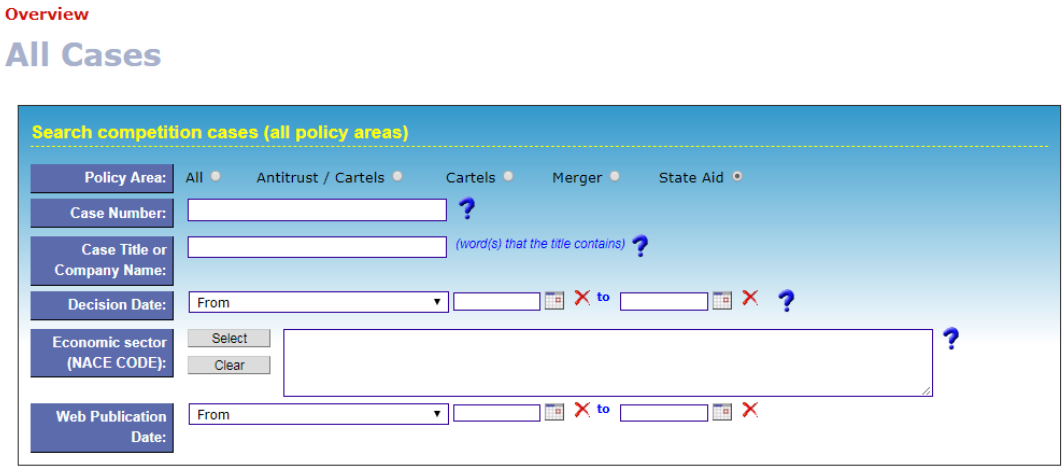
Country-level variables	
Regulatory quality index	Annual changing estimate of the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development; a value of -2.5 is considered weak and a value of 2.5 as strong; defined as RQ.EST; *data source: World Bank's worldwide governance indicators*
Rule of law index	Annual changing estimate of perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of standard normal distribution, i.e., ranging from approximately -2.5 to 2.5; defined as RL.EST; *data source: World Bank's worldwide governance indicators*
Control of corruption index	Annual changing estimate of perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of standard normal distribution, i.e., ranging from approximately -2.5 to 2.5; defined as CC.EST; *data source: World Bank's worldwide governance indicators*
Government effectiveness index	Annual changing estimate of perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of standard normal distribution, i.e., ranging from approximately -2.5 to 2.5;

	defined as GE.EST; *data source: World Bank's worldwide governance indicators*
⊿Unemployment rate	Annual change of the unemployment rate defined as a percentage of the labor force (the total number of people employed plus unemployed); defined as SL.UEM.TOTL.ZS; *data source: World Bank's worldwide governance indicator*
⊿GDP growth rate	The annual percentage growth rate of GDP at market prices based on constant local currency; defined as NY.GDP.MKTP.KD.ZG; *data source: World Bank's worldwide governance indicators*

Appendix B: Guide on How to Identify Banks with State Aid

This snapshot depicts the database that is relevant for screening the banks with state aid. First, I selected the policy area under "state aid" as shown. Second, via the economic sector selection, I chose "K - Financial and insurance activities" to obtain the publicly available list of state aid decisions made. Although the EC must publish its decisions or a summary notice in the Official Journal at least, the Member States may ask for the non-disclosure of information covered by the obligation to keep professional secrecy which complicated the data collection process. The link to the database with the cases is: https://ec.europa.eu/competition/elojade/isef/index.cfm?clear=1&policy_area_id=3 (accessed throughout 2018-2020, last time: 03.04.2021)
To capture all banks with state aid, including all forms of public assistance, using taxpayer-funded resources, I also screened a list of all public and private banks in the EU via a google search "state aid" / "bail-out" and the name of the bank. The list of banks was obtained via CapitalIQ and the industry code SIC code: 60-62. Secondary sources such as CEPS task for reports on bank state aid and past literature (e.g., Gerhardt and Vennet [2017]), were also consulted to identify state aid banks.

Screenshot of the EU database



Appendix C: Overview of EU State Aid Rules in the Financial Crisis

The Commission's approach concerning state aid for banks is explained via means of so-called Communications of which five major Communications have been released for the financial sector and that have had importance during the financial crisis.[44] The EC normally issues specific Communications to lay down guidelines on specific criteria, for example, criteria for assessing the compatibility of state aid in the banking sector. Generally, a Communication belongs to a standard procedure when the EC faces a new policy challenge, and it is a policy paper to inform the EU lawmakers of the situation. A consultation process with different stakeholders precedes the publication of the Communication. The Communication functions like a memorandum that explains the Commission's views on an issue.

Communication	***Key Features***
First Banking Communication of 13 October 2008	• Gives guidance on the application of state aid rules to public support schemes as well as individual assistance for financial institutions • Points out essential elements for authorizing state aid are non-discrimination, limited in time and scope of aid, appropriately remunerated • Requires that state aid receiving banks should abstain from abusing state aid to aggressively expand • Emphasizes the need for structural measures for the whole financial sector
Recapitalisation Communication of 5 December 2008	• Provides more detailed remuneration criteria • Safeguards were built in to ensure that public capital is used to sustain lending to the real economy • Aims to avoid fostering aggressive commercial conduct to detriment of competitors who have managed without state aid
Impaired Asset Communication of 25 February 2009	• Aims to tackle impaired assets on balance sheets by providing guidance for aid linked to relieving banks from these assets • Foreseeable losses should be disclosed and properly handled by banks • Provides methodologies for valuation of impaired assets and necessary remuneration of state for asset relief
Restructuring Communication of 19 August 2009	• Offers more details on conditions as to when banks need to submit a restructuring plan and what measures should be included • Requires having strategies to remedy unsustainable business models • Aims to achieve long term viability without state support under adverse economic conditions
Fifth Communication of 10 July 2013	• Voices importance of a sound plan for restructuring or orderly winding down before banks can benefit from recapitalizations or asset protection measures

[44] Information has directly been sourced from http://ec.europa.eu/competition/state_aid/legislation/temporary.html and https://ec.europa.eu/commission/presscorner/detail/en/MEMO_14_507 (access date: 15.02.2019)

	• Strengthened burden-sharing requirements obliging shareholders and junior creditors to contribute first before banks can ask for public funding • State-aided banks were asked to introduce strict executive remuneration policies and give management proper incentives to implement restructuring plan and repay aid
Additional Communication	
Additional Communication on the return to viability and the assessment of restructuring measures of 23 July 2009	• Explains how the EC will examine aid for the restructuring of banks • Will be applied for the assessment of restructuring aid notified to the Commission on or before 31 December 2010
Additional Communication on state aid rules to support measures in favor of banks in the context of the financial crisis of 01 December 2010	• Describes steps of the EC to set out a gradual phasing out regards to a recapitalization and impaired asset measures • Describes advancement of the exit process

Appendix D: Monitoring Trustee's Characteristics and Duties

This table summarizes the characteristics and duties of monitoring trustees (MT) to give readers an idea of the monitoring trustee's duties and assigned work. As the responsibilities may vary across different banks and even for a single mandate as the scope of the mandate may change over time, this overview should not be regarded as being all-encompassing. Normally, all duties of an MT are specified in the commitment catalog to which I have (to this date) no access because these files are not publicly available and not all data is publicly available, also due to the obligation to keep professional secrecy.

Panel A:

Characteristics	**Exemplary Sources**
Legal person: The MT is one or more natural or legal person(s).	*Brussels, 30.05.2012 C (2012) 3540;* *Brussels, 16.12.2015 C (2015) 9349 final;* *Brussels, 04.07.2017 C (2017) 4690 final*
Presence: The MT can be physically present in the bank.	*Brussels, 09.07.2014 C (2014) 4662 final;* *Brussels, 29.04.2014 C (2014) 2933 final;* *Brussels, 23.07.2014 C (2014) 5201 final; 21.11.2012 Official Journal of the European Union C 359/45*
Appointment: The MT is appointed by the concerned bank with the approval of the Commission; the appointment takes place after the Commission's endorsement; the Commission may object to appointments if it, for example, has doubts with regards to the conflict of interest.	*Brussels, 18.11.2009 C (2009) 8980 final;* *Brussels, 18.11.2009 C (2009) 9087 final;* *Brussels, 14.12.2009 C (2009)10112 final;* *Brussels, 30.06.2010 C (2010) 4487 final;* *15.4.2010 Official Journal of the European Union C 95/27;* *Brussels, 31.3.2011 C (2011) 2262 final;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brüssel, 04.10.2012 C (2012) 7047 final;* *Brussels, 11.05.2012 C (2012) 3150 final;* *Brussels, 16.11.2012 C (2012) 8238 final;* *Brussels, 20.12.2012 C (2012) 9840 final;* *Brussels, 27.7.2012 C (2012) 5390 final;* *Brussels, 20.12.2012 C (2012) 9886 final;* *Brüssel, 05.02.2013 C(2013) 507 final;* *Brussels, 09.07.2014 C (2014) 4662 final;* *Brussels, 30.08.2013 C (2013) 5669 final;* *110/40 Official Journal of the European Union 12.4.2014;* *Brussels, 29.04.2014 C (2014) 2933 final;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 23.07.2014, C (2014) 5201 final;* *Brussels, 16.12.2015 C (2015) 9349 final;* *Brussels, 21.11.2016 C(2016) 7526 final*
Conflict of interest: The MT needs to be independent (of the country and the concerned bank) to avoid any conflict of interest; the Commission can require its replacement in a case of conflict of interest.	*Brussels, 18.11.2009 C (2009) 8980 final;* *Brussels, 18.11.2009 C (2009) 9087 final;* *Brussels, 30.06.2010 C (2010) 4487 final;* *Brussels, 30.05.2012 C (2012) 3540;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 20.12.2012 C (2012) 9840 final;* *Brussels, 30.08.2013 C (2013) 5669 final;* *Brussels, 09.07.2014 C (2014) 4662 final;* *110/40 Official Journal of the European Union 12.4.2014;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 2.7.2015 C (2015) 4635 final;* *Brussels, 19.12.2015 C (2015) 9762 final;* *15.4.2010 Official Journal of the European Union C 95/27;* *Brussels, 16.12.2015 C (2015) 9349 final*
Remuneration: The MT is remunerated by the bank in a way that does not impede the independent and effective fulfillment of its mandate.	*Brussels, 18.11.2009 C (2009) 9087 final;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 30.08.2013 C (2013) 5669 final;* *Brussels, 09.07.2014 C (2014) 4662 final;*

	15.4.2010 Official Journal of the European Union C 95/27; *Brussels, 16.12.2015 C (2015) 9349 final*
Qualification: The MT must possess, as an investment bank, consultant, or auditor, the knowledge, expertise, and workforce that is required to carry out its mandate.	*Brussels, 18.11.2009 C (2009) 8980 final;* *Brussels, 30.06.2010 C (2010) 4487 final;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 18.12.2013 C (2013) 9632 final;* *Brussels, 24.7.2013 C (2013) 4801 final;* *110/40 Official Journal of the European Union 12.04.2014;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 04.07.2017 C (2017) 4690 final*
Additional advisors: The MT may appoint additional advisors (e.g., for corporate finance and legal advice); only the MT or the Commission can instruct the advisors.	*Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 30.08.2013 C (2013) 5669 final;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 19.12.2015 C (2015) 9762 final*
End of activities: The MT can cease its activities only after the Commission has discharged the MT from its duties and can reappoint the MT if it finds that some relevant commitments have not been properly implemented as agreed in the prior commitments.	*Brussels, 30.03.2012 C (2012) 2227 final;* *Brussels, 20.12.2012 C (2012) 9840 final;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 30.08.2013 C (2013) 5669 final;* *110/40 Official Journal of the European Union 12.4.2014;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 19.12.2015 C (2015) 9762 final*

Panel B:

Duties	**Exemplary Sources**
The MT must monitor and correct compliance with all points set out in the commitment agreement (which may differ across banks).	*Brussels, 14.12.2009 C (2009)10112 final;* *Brussels, 18.11.2009 C (2009) 8980 final;* *15.4.2010 Official Journal of the European Union C 95/27;* *Brussels, 20.12.2011 C (2011) 9755 final;* *Brussels, 30.05.2012 C (2012) 3540;* *Brussels, 25.7.2012 C (2012) 5063 final;* *Brussels, 28.11.2012 C (2012) 8764 final;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 20.12.2012 C (2012) 9840 final;* *Brussels, 24.7.2013 C (2013) 4802 final;* *Brussels, 18.12.2013 C (2013) 9632 final;* *Brussels, 18.12.2013 C (2013) 9632 final;* *Brussels, 19.12.2013 C (2013) 9592 final;* *110/40 Official Journal of the European Union 12.4.2014;* *Brussels, 29.04.2014 C (2014) 2933 final;* *Brussels, 13.08.2014 C (2014) 5857 final;* *Brussels, 23.07.2014 C (2014) 5201 final;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 19.12.2015 C (2015) 9762 final;* *Brussels, 11.10.2017 C (2017) 6896 final;* *Brussels, 31.08.2018 C (2018) 5749 final*
The MT must follow orders or instructions from the Commission and the MT is not entitled to follow instructions obtained from the concerned bank.	*15.4.2010 Official Journal of the European Union C 95/27;* *Brussels, 20.12.2011 C (2011) 9755 final;* *Brussels, 28.11.2012 C (2012) 8759 final,* *Brussels, 30.08.2013 C (2013) 5669 final;* *Brussels, 25.11.2014 C (2014) 8959 final*
The MT must file reports frequently (e.g., half-yearly; quarterly, yearly) to be sent to the Commission and the respective country; the bank may also obtain the reports but only a non-	*Brussels, 18.11.2009 C (2009) 9000 final corr.;* *Brussels, 18.11.2009 C (2009) 8980 final;* *Brussels, 14.12.2009 C (2009)10112 final;* *15.4.2010 Official Journal of the European Union C 95/27;* *Brussels, 30.06.2010 C (2010) 4487 final;* *Brussels, 31.3.2011 C (2011) 2262 final;*

confidential version of the report. MT must also submit a final report.	*Brussels, 11.05.2012 C (2012) 3150 final;* *Brussels, 30.05.2012 C (2012) 3540;* *Brussels, 16.11.2012 C (2012) 8238 final;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 25.7.2012 C (2012) 5063 final;* *Brussels, 20.12.2012 C (2012) 9840 final;* *Brussels, 19.12.2013 C (2013) 9592 final;* *Brussels, 18.12.2013 C (2013) 9632 final;* *Brussels, 30.08.2013 C (2013) 5669 final;* *Brussels, 09.07.2014 C (2014) 4662 final;* *Brussels, 23.07.2014 C (2014) 5201 final;* *Journal of the European Union 12.4.2014; 25.11.2014;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 24.02.2014 C (2014) 1202 final;* *Brussels, 13.08.2014 C (2014) 5857 final;* *Brussels, 9.4.2015 C (2015) 2353 final;* *Brussels, 22.11.2015 C (2015) 8374 final;* *Brussels, 16.12.2015 C (2015) 9349 final;* *Brussels, 19.12.2015 C (2015) 9762 final;* *Brussels, 25.6.2017 C (2017) 4501 final;* *Brüssel, 17.3.2017 C (2017)1695 final;* *Brussels, 11.10.2017 C (2017) 6896 final;* *Brussels, 31.08.2018 C (2018) 5749 final; 110/40 Official*
The MT must monitor the implementation on corporate governance; MT is allowed and should attend, as an observer, the meetings of the Managing Board, Credit Council, Credit Committee as well as the meetings of the Audit Committee	*Brussels, 09.07.2014 C (2014) 4662 final;* *Brussels, 29.04.2014 C (2014) 2933 final; Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 18.12.2013 C (2013) 9632 final;* *Brussels, 31.3.2011 C (2011) 2262 final;* *Brussels, 13.08.2014 C (2014) 5857 final;* *Brussels, 24.7.2013 C (2013) 4801 final;* *Brussels, 23.05. 2011C (2011) 3589 final*
The MT must monitor the implementation on commercial operations and assessment of projected operational results (e.g., implementation of a litigation policy to maximize recoveries, monitor pricing policies, limit the risk of prioritizing volume growth; review Know-Your-Client (KYC) and Anti-Money-Laundering (AML) procedures; monitor agreed measures to reach cost-to-income ratio, restrictions on commercial advertising and acquisition bans or dividend bans).	*Brussels, 14.12.2009 C (2009)10112 final;* *15.4.2010 Official Journal of the European Union C 95/27;* *Brussels, 20.12.2011 C (2011) 9755 final;* *Brussels, 25.7.2012 C(2012) 5063 final;* *Brussels, 11.05.2012 C (2012) 3150 final;* *Brussels, 16.11.2012 C (2012) 8238 final;* *21.11.2012 Official Journal of the European Union C 359/45;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 20.12.2012 C (2012) 9840 final;* *Brussels, 24.7.2013 C (2013) 4801 final;* *Brussels, 18.12.2013 C (2013) 9632 final;* *Brussels, 24.7.2013 C (2013) 4802 final* *Brussels, 09.07.2014 C (2014) 4662 final;* *Journal of the European Union 12.4.2014;* *Brussels, 29.04.2014 C (2014) 2933 final;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 23.07.2014 C (2014) 5201 final;* *Brussels, 24.02.2014 C (2014) 1202 final;* *Brussels, 13.08.2014 C (2014) 5857 final;* *Brussels, 16.12.2015 C(2015) 9349 final;* *Brussels, 04.07.2017 C (2017) 4690 final;* *Brussels, 11.10.2017 C (2017) 6896 final;* *Brussels, 31.08.2018 C (2018) 5749 final; 110/40 Official*
The MT must monitor commitments given on the restructuring of activities in the home country and abroad.	*Brussels, 18.11.2009 C (2009) 8980 final;* *Brussels, 14.12.2009 C (2009)10112 final;* *15.4.2010 Official Journal of the European Union C 95/27;* *Brussels, 31.3.2011 C (2011) 2262 final;* *Brussels, 11.05.2012 C (2012) 3150 final;*

	Brussels, 20.12.2012 C (2012) 9886 final *Brussels, 25.7.2012 C (2012) 5063 final;* *Brussels, 20.12.2012 C (2012) 9840 final;* *Brussels, 13.05.2013 C (2013) 2793 final;* *Commission Decision of 3 September 2013 — State aid SA.32554 (09/C);* *Brussels, 18.12.2013 C (2013) 9632 final;* *Brüssel, 05.02.2013 C (2013) 507 final;* *Brussels, 24.02.2014 C (2014) 1202 final;* *Brussels, 09.07.2014 C (2014) 4662 final;* *Brussels, 25.11.2014 C (2014) 8959 final*
The MT must engage in risk monitoring: loans exceeding a certain predefined exposure must be reported to the MT. The MT must receive access to the information regarding credit risk management and the set of alerts and reports, which help the risk management department to identify loan impairments, to assess the provisioning of non-performing loans, to assess the recoverability of loans and early signs of loan impairments and the overall exposure to individual clients or credit portfolios. MT might also assess the request for a revision of Value at Risk (VaR), stop loss limit on proprietary trading, and provide a report to the Commission for its endorsement; the MT can also propose corrective and improvement actions to the Board of Directors if necessary. MT may review the most significant loans regularly and interview all members of the relevant committees responsible. Supervising the reduction of the balance sheet and risk-weighted assets (RWA) may also be required by the MT.	*Brussels, 30.06.2010 C (2010) 4487 final;* *Brussels, 31.3.2011 C (2011) 2262 final;* *Brussels, 16.11.2012 C (2012) 8238 final;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 20.12.2012 C (2012) 9840 final;* *Brussels, 20.12.2012 C (2012) 9830 final* *Brussels, 13.05.2013 C (2013) 2793 final;* *Commission Decision of 3 September 2013 — State aid SA.32554 (09/C);* *Brussels, 18.12.2013 C (2013) 9632 final;* *Brussels, 24.02.2014 C (2014) 1202 final;* *Brussels, 29.04.2014 C (2014) 2933 final;* *110/40 Official Journal of the European Union 12.4.2014;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 23.07.2014 C (2014) 5201 final;* *Brussels, 09.07.2014 C (2014) 4662 final;* *Brussels, 19.12.2015 C (2015) 9762 final;* *Brussels, 11.10.2017 C (2017) 6896 final;* *Brussels, 31.08.2018 C (2018) 5749 final*
The MT can postpone the granting of credit lines or loans if conditions do not appear to be met or the MT has received insufficient information.	*Brussels, 09.07.2014 C (2014) 4662 final*
The MT must agree if assets and liabilities shall be transferred between units.	*Brussels, 04.07.2017 C (2017) 4690 final*
The MT must analyze and report any remedial actions proposed by the bank to the Commission if the bank is failing to meet any commitments set out in the prior commitment catalogue.	*Brussels, 31.3.2011 C (2011) 2262 final;* *Brussels, 20.12.2012 C (2012) 9840 final;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 04.07.2017 C (2017) 4690 final*
The MT has unrestricted access to all information needed to monitor the agree implementations; this includes any books, records, documents,	*Brussels, 18.11.2009 C (2009) 9087 final;* *15.4.2010 Official Journal of the European Union C 95/27;* *Brussels, 31.3.2011 C (2011) 2262 final;* *Brussels, 28.11.2012 C (2012) 8759 final;* *Brussels, 20.12.2012 C (2012) 9840 final;*

management or other personnel, facilities, sites and technical information of the bank or of the business to be sold that are necessary to fulfil the MT's duties under its mandate.	*Brussels, 20.12.2012 C (2012) 9886 final* *Brussels, 13.05.2013 C (2013) 2793 final;* *Brussels, 30.08.2013 C (2013) 5669 final;* *Brussels, 18.12.2013 C (2013) 9632 final;* *Brussels, 25.11.2014 C (2014) 8959 final;* *Brussels, 24.02.2014 C (2014) 1202 final;* *Brussels, 13.08.2014 C (2014) 5857 final;* *110/40 Official Journal of the European Union 12.4.2014;* *Brussels, 22.11.2015 C (2015) 8374 final;* *Brussels, 19.12.2015 C (2015) 9762 final;* *Brussels, 04.07.2017 C (2017) 4690 final*
The MT must report immediately to the Commission if it has reasons to assume that the respective bank is failing to comply with the agreed commitments.	*Brussels, 30.08.2013 C (2013) 5669 final;* *Brussels, 18.12.2013 C (2013) 9632 final*
The MT is required to monitor any divestment of business sub-units as agreed in the commitment catalogue.	*Brussels, 20.12.2011 C (2011) 9755 final*
On confidential basis, a relevant competitor shall provide the MT with information regarding the market share, if needed.	*Brussels, 20.12.2011 C (2011) 9755 final*

Appendix E: Example of EC's Decision and Monitoring Trustees' Responsibilities

This excerpt shows an example of a publicly available EC's decision concerning the state aid of Catalunya Banc S.A., State aid n° SA. 33735 (2012/N). As the responsibilities may vary across different banks and even for a single mandate as the scope of the mandate may change over time, this overview should not be regarded as being all-encompassing. Normally, all duties of a Monitoring Trustee are specified in the commitment catalog to which I have had no access because these files are not publicly available.

EUROPEAN COMMISSION

Brussels, 28.11.2012
C(2012) 8759 final

Subject: **State aid n°| SA. 33735 (2012/N) – Spain**
Restructuring of Catalunya Banc S.A.

(98) Furthermore, in order to ensure that the various commitments are duly implemented during the implementation of the Restructuring Plan, the Spanish authorities commit to the appointment of a monitoring trustee in charge of monitoring all the commitments undertaken by the Spanish authorities and the Bank towards the Commission (**"the Monitoring Trustee"**). The Monitoring Trustee will be appointed by the Bank, and must be endorsed by the Commission. The Monitoring Trustee must be independent of the Bank and be remunerated by the Bank. The Monitoring Trustee will report to the Commission.

Appendix F: Credit Risk Disclosure Score Construction

This table outlines the items accounted for in the credit risk disclosure score. The best practice recommendations follow the Basel Committee on Banking Supervision (2000): Basel Committee Publications - Best Practices for Credit Risk Disclosure, https://www.bis.org/publ/bcbs74.htm (access date: 10.02.2020)

Disclosures	Type of disclosure	Basel II Table	IAS / IFRS	Best Practice Recommendation
Definition past due/impaired	*Qualitative*	*4a*	*IFRS 7.33b*	*7*
Description of approaches for specific and general allowances	*Qualitative*	*4a*	*IFRS 7.33b*	*7*
Total gross credit exposure	*Quantitative*	*4b*	*IFRS 7.36 (a), IG21*	*19*
Inclusion of off-balance sheet commitments to the credit exposure	*Qualitative*	*4b*	*IFRS 7.36 (a), IG21, B10*	*-*
Distribution of credit exposure by major geographic areas	*Quantitative*	*4c*	*IFRS 7.36 (a), 34 (c)*	*12*
Amount of credit exposure by geographic region	*Quantitative*	*4c*	*IFRS 7.37 (a), 20(e), IG29*	*12*
Distribution of credit exposure by counterparty or industry	*Quantitative*	*4d*	*IFRS 7.36 (a), 34 (c)*	*19*
Amount of credit exposure by industry	*Quantitative*	*4f*	*IFRS 7.37 (a), 20(e), IG29*	*19*
Amount of credit risk exposure by counterparty	*Quantitative*	*4f*	*IFRS 7.36 (a), 34 (c)*	*19*
Amount of credit risk exposure by segment (business line)	*Quantitative*	*4f*	*IAS 14.9*	*10*
Residual maturity breakdown of the whole portfolio	*Quantitative*	*4e*	*IFRS 7.39*	*9*
Amount of specific and general allowances by industry or counterparty	*Quantitative*	*4f*	*IFRS 7.37(b), B11 E*	*20*
Allowances broken down by specific and general	*Quantitative*	*4f*	*IFRS 7.37(b)*	*20*
Reconciliation of changes in the allowances for loan impairment	*Quantitative*	*4h*	*IFRS 7.16, IAS 37.84*	*21*
Explanation of internal rating process/description of external ratings used	*Qualitative*	*5a/6a-c*	*IFRS 7.36(c), IG 24, IG 25*	*8*
Breakdown of credit risk exposure by internal/external rating classes	*Quantitative*	*5b/6d*	*IFRS 7.36(c), IG23-25*	*18*
Description of collateral received for financial assets	*Qualitative*	*7a*	*IFRS 7.36(b), IG 22, 15*	*14*
Amount of total credit exposure covered by collateral	*Quantitative*	*7b*	*IFRS 7.36(b), 38, 15*	*14*
Amount of total credit exposure covered by guarantees	*Quantitative*	*7c*	*IFRS 7.36(b), 38*	*14*
Total amount of counterparty credit risk	*Quantitative*	*8a*	*IFRS 7.36(a)*	*11*
Total amount of restructured loans	*Quantitative*	*8b*	*-*	*23*
Description of significant concentrations of credit risk	*Qualitative*	*8a*	*IFRS 7.34*	*13*
Description of techniques used to mitigate/reallocate credit risk (derivatives, guarantees)	*Qualitative*	*8a*	*-*	*14*
Total amount of credit derivatives	*Quantitative*	*8b*	*IFRS 7.36(b), 38*	*15*
Separate Pillar 3 Report	*Qualitative*	*-*	*-*	*-*

Appendix G: Example of AIB – Annual Report 2009

This table outlines the coding for AIB's annual report in 2009 and the items used to set up the credit risk disclosure score in 2009.
(Link: https://aib.ie/content/dam/aib/investorrelations/docs/Annual%20General%20Meeting/2010/annual-financial-report-2009.pdf; access date: 15.08.2020). The maximum score is 25 and AIB scored 24 out of 25 in 2009.

Disclosure item	1/0	Page	Section / Passage
Definition past due/impaired	1	30	"Impaired: a loan is impaired if there is objective evidence of impairment as a result of one or more events that occurred after the initial recognition of the assets (a 'loss event') and that loss event (or events) has an impact such that the present value of future cash flows is less than the current carrying value of the financial asset or group of assets i.e., requires a provision to be raised through the profit and loss."
Description of approaches for specific and general allowances	1	74, 83	"Specific provisions arise when the recovery of a specific loan or group of loans is significantly in doubt. The amount of the specific provision will reflect the financial position of the borrower and the net realizable value of any security held for the loan or group of loans. In practice, the specific provision is the difference between the present value of expected future cash flows for the impaired loan(s) and the carrying value. When raising specific provisions, AIB divides its impaired portfolio into two categories, namely individually significant and individually insignificant." "The increase in provisions (as a percentage of total loans, including loans and receivables held for sale to NAMA) from 1.74% to 5.50% reflects the increased provisioning across all divisions, particularly in specific provision in the period. Specific allowances are allocated to individual impaired loans. Impaired loans increased from €2,991 million in 2008 to €17,453 million at December 2009. Specific provisions as a percentage of total loans increased from 0.87% to 4.46% (the geographic splits by sector of specific provisions for non-NAMA and NAMA are set out on pages 85 and 90 respectively).
Total gross credit exposure	1	71	"Maximum exposure to credit risk"
Inclusion of off-balance sheet commitments to the credit exposure	1	71	"The table below sets out the maximum exposure to credit risk that arises within the Group and distinguishes between those assets that are carried in the statement of financial position at amortised cost and those carried at fair value. The most significant credit risks arise from lending activities to customers and banks, trading portfolio, available for sale, held for sale and held to maturity financial investments, derivatives and 'off-balance sheet' guarantees and commitments. The credit risks arising from balances at central banks, treasury bills and items in course of collection are deemed to be negligible based on their maturity and counterparty status."
Distribution of credit exposure by major geographic areas	1	91	Cross-border outstanding with counties United Kingdom, United States, Germany, France, Spain, Italy, Australia etc.
Amount of credit exposure by geographic region	1	78	Table with Ireland, UK, USA, Poland and Rest of World
Distribution of credit exposure by counterparty or industry	1	79	Table with Agriculture, Energy, Manufacturing, Construction and property, Distribution, Transport, Financial, Services, Personal and Lease financing
Amount of credit exposure by industry	1	78	Table with amounts regarding the following industries: Agriculture, Energy, Manufacturing, Construction and property, Distribution, Transport, Financial, Services, Personal and Lease financing
Amount of credit risk exposure by counterparty	1	196	Table with amount of credit exposure including loans and receivables to banks and loans and receivables to customers

Amount of credit risk exposure by segment (business line)	1	197	Table with AIB Bank Ireland, AIB Bank UK and Capital Markets
Residual maturity breakdown of the whole portfolio	1	258	Table with financial assets and financial liabilities by contractual residual maturity
Amount of specific and general allowances by industry or counterparty	1	80	Table with amounts include Loans and receivables to banks and to customers.
Allowances broken down by specific and general	1	80	Table with provisions at end of period, specific and IBNR (collective)
Reconciliation of changes in the allowances for loan impairment	1	80	Movements in provisions for impairment of loans and receivables
Explanation of internal rating process/description of external ratings used	1	30, 51	"The Group's rating systems consist of a number of individual rating tools designed to assess the risk within particular portfolios. These ratings tools are calibrated to meet the needs of individual business units in managing their portfolios. All rating tools are built to a Group standard and independently validated by Group." "Perhaps the most significant amendment is the ability of banks to use the outputs of their own internal rating systems to calculate capital requirements for credit risk. This is known as the internal ratings-based approach ("IRBA")."
Breakdown of credit risk exposure by internal/external rating classes	1	216	Table with external ratings profiles of loans and receivables to banks, trading portfolio financial assets (excluding equity securities), financial investments available for sale (excluding equity shares) and financial investments held to maturity are as follows
Description of collateral received for financial assets	1	74	"In relation to individual exposures, while the perceived strength of the borrower's repayment capacity is the primary factor in granting the loan, AIB uses various approaches to help mitigate risks in individual credits including transaction structure, security, and guarantees. These items of collateral or guarantees are required as a secondary source of repayment in the event of the borrower's default. Guidelines covering the acceptability of different forms of security and how it should be valued are outlined in the various Divisional policy papers. The main types of collateral for loans and receivables to customers are as follows:…"
Amount of total credit exposure covered by collateral	1	195	"Under reverse repurchase agreements, the Group has accepted collateral that it is permitted to sell or repledge in the absence of default by the owner of the collateral. The fair value of collateral received amounted to o 679 million…"
Amount of total credit exposure covered by guarantees	1	241	Table with guarantees and assets pledged as collateral security
Total amount of counterparty credit risk	0	-	-
Total amount of restructured loans	1	199	"Loans and receivables renegotiated are those facilities at the current reporting date that, during the financial year, have had their terms renegotiated resulting in an upgrade from 91+ days past due or impaired status to performing status such that if they were not renegotiated, they would be otherwise past due or impaired. Renegotiated loans and receivables were d 4,459 million as at 31 December 2009 (Allied Irish Banks, p.l.c.: d 4,178 million)."

Description of significant concentrations of credit risk	1	198	AIB's Group Large Exposure Policy sets out maximum exposure limits to, or on behalf of, a customer or a group of connected customers. At 31 December 2009, the Group's top 50 exposures amounted to d 20.0 billion, and accounted for 15.4% of the Group's on balance sheet gross loans and receivables to customers including those held for sale to NAMA (d 19.0 billion and 14.4% at 31 December 2008). Of this amount 11.2 billion relate to loans held for sale to NAMA. No single customer exposure exceeds regulatory guidelines. See also Risk Management - Credit risk management and mitigation.
Description of techniques used to mitigate/reallocate credit risk (derivatives, guarantees)	1	74	"In relation to individual exposures, while the perceived strength of the borrower's repayment capacity is the primary factor in granting the loan, AIB uses various approaches to help mitigate risks in individual credits including transaction structure, security, and guarantees."
Total amount of credit derivatives	1	190	Table with credit derivatives contracts total
Separate Pillar 3 Report	1		Link: https://aib.ie/content/dam/aib/investorrelations/docs/resultscentre/pillar3/pillar-3-2009.pdf
Total Score	24		

Appendix H: Disclosing versus Not Disclosing the MT's Presence in a Bank

This table reports ordinary least squares regression coefficient estimates examining the impact of the Monitoring Trustees (MT) on the LLA ratio and financial restatements for the income statement only (as shown in tables 4 and 5). I include year and bank fixed effects in the regressions. Columns (1) and (3) exclude all banks that have not disclosed having an MT. Columns (2) and (4) exclude all banks that have disclosed having an MT. Disclosing banks (20) include listed and non-listed banks. The table reports ordinary least squares coefficient estimates and p-values based on robust standard errors clustered by bank in (1)-(4). The specific description of variables used in this table can be found in Appendix A. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level (two-tailed), respectively.

Monitoring Trustee – Disclosing versus Non-Disclosing MTs				
	(1)	(2)	(3)	(4)
Dependent Variable:	LLA Ratio (Disclosing)	LLA Ratio (Not Disclosing)	Restatements (Income Statement - Disclosing)	Restatements (Income Statement - Not Disclosing)
Test Variables:				
Monitoring Trustee	-	-	-	-
Post	0.004	0.001	-0.012	-0.023
Monitoring Trustee * Post	0.033**	0.005	0.171**	0.062
Control Variables	*Yes*	*Yes*	*Yes*	*Yes*
Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Bank FE	*Yes*	*Yes*	*Yes*	*Yes*
N (bank-years)	888	935	888	935
R^2	0.750	0.674	0.259	0.251
Adj. R^2	0.717	0.634	0.170	0.165

Appendix I: Excerpt of the Interviews

The interviews were not recorded and only contain the personal views of the people interviewed and not the view and opinions of the EC. The purpose of the interviews was to obtain key insights from experts regarding the role of monitoring trustees in the European Union. Some questions were also answered by email by the DG Competition which are not disclosed here. Approval was obtained from the interviewee to publish the interview questions as shown below.

Participants' Information

- **First name:** [redacted]
- **Last name:** [redacted]
- **Area of expertise:** DG Competition, Directorate for Financial Services
- **Name of organization:** European Commission
- **Location of headquarters:** Brussels, Belgium
- **Interview conducted via:** Phone, no recording

Interview questions [redacted]

1. Why did the EC come up with installing MTs in banks?
2. How do the Monitoring Trustees (MTs) in the EU compare to other similar monitoring tools in other jurisdictions?
3. Where foreign jurisdiction (US anti-trust law) a role model when installing MTs?
4. Who decides whether a bank gets a MT or not?
5. Can banks opt out to get MTs assigned?
6. Who sets the salary?
7. Are there salary levels available (at least ranges)?
8. Have there been cases of misconduct?
9. For which cases did the EC choose the MT and for which cases did the bank choose the MT?
10. Is it possible to obtain the MTs names and their obligations? (via NDA)
11. Why is it so difficult to find news articles about the MTs and their work?

Figures

Figure 1: Monitoring Trustee Mechanism

This figure illustrates the relationship between the relevant parties involved, namely the DG COMP, the bank as well as the Monitoring Trustee. It is based upon information collected from the European Commission, including links like https://www.coleurope.eu/sites/default/files/uploads/event/role_of_trustees.ppt (access date: 01.06.2018) and information from the DG Comp as well as interviews.

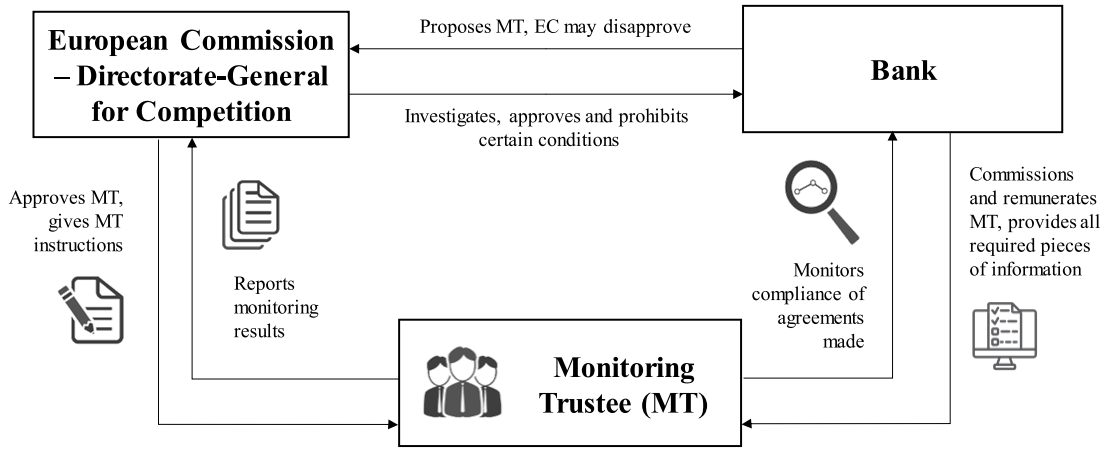
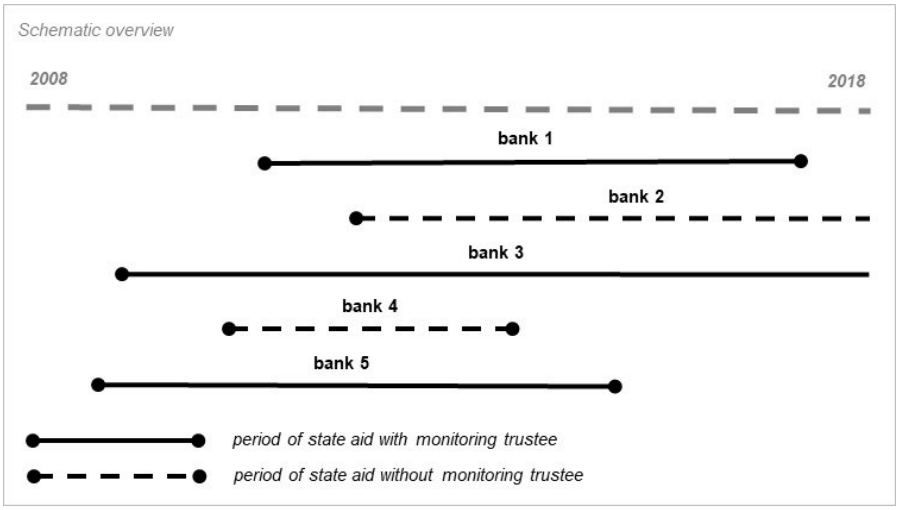
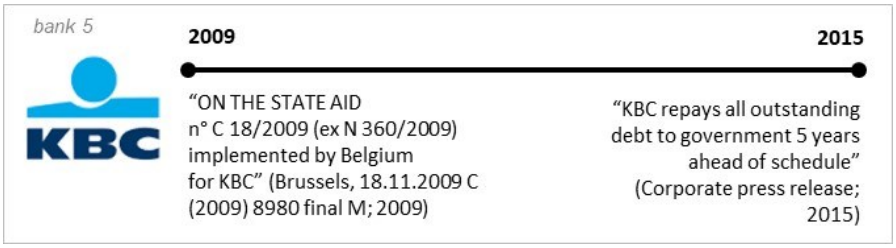


Figure 2: Identification Strategy

This figure illustrates the identification strategy. I employ a difference-in-differences design based on the staggered adoption of state aid decisions with and without monitoring trustees. It was assumed that the state aid was active until the end of the period of analyses if no corporate press releases were found that explicitly stated a repayment of the state aid. For my baseline analyses, I assume as shown in panel B, that the Monitoring Trustee does not switch back to zero once the state aid ends.

Panel A:





Panel B:

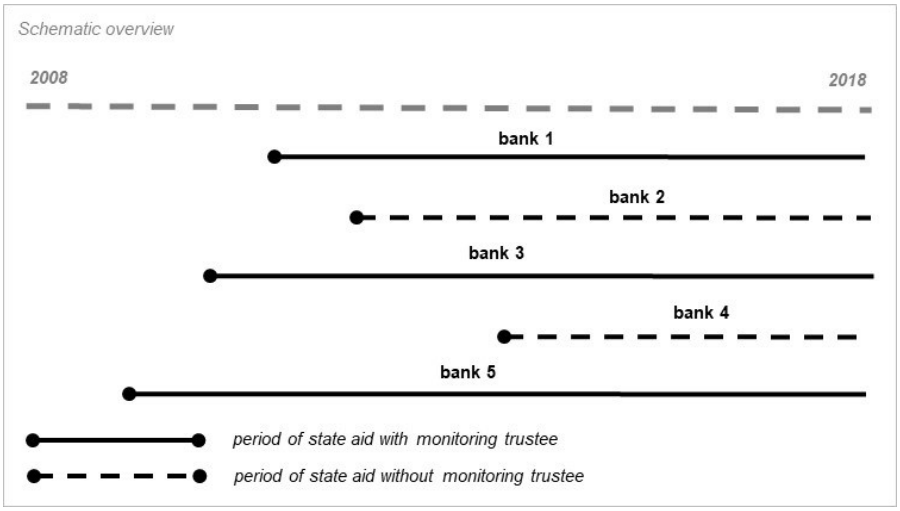


Figure 3: Distribution of Monitoring Trustees across the Whole Sample

This figure shows the distribution of banks with state aids with and without monitoring trustees over time, starting from 2005 to 2019, including all 122 identified cases as described in Table 1. 2008-2012 have been the years with most banks receiving state aid in the sample.

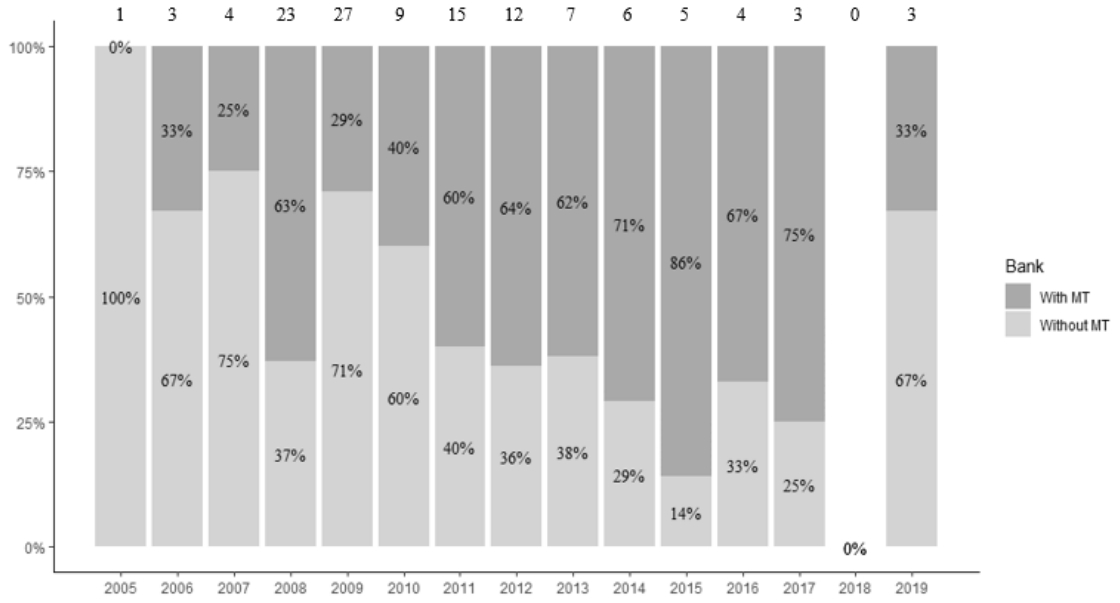
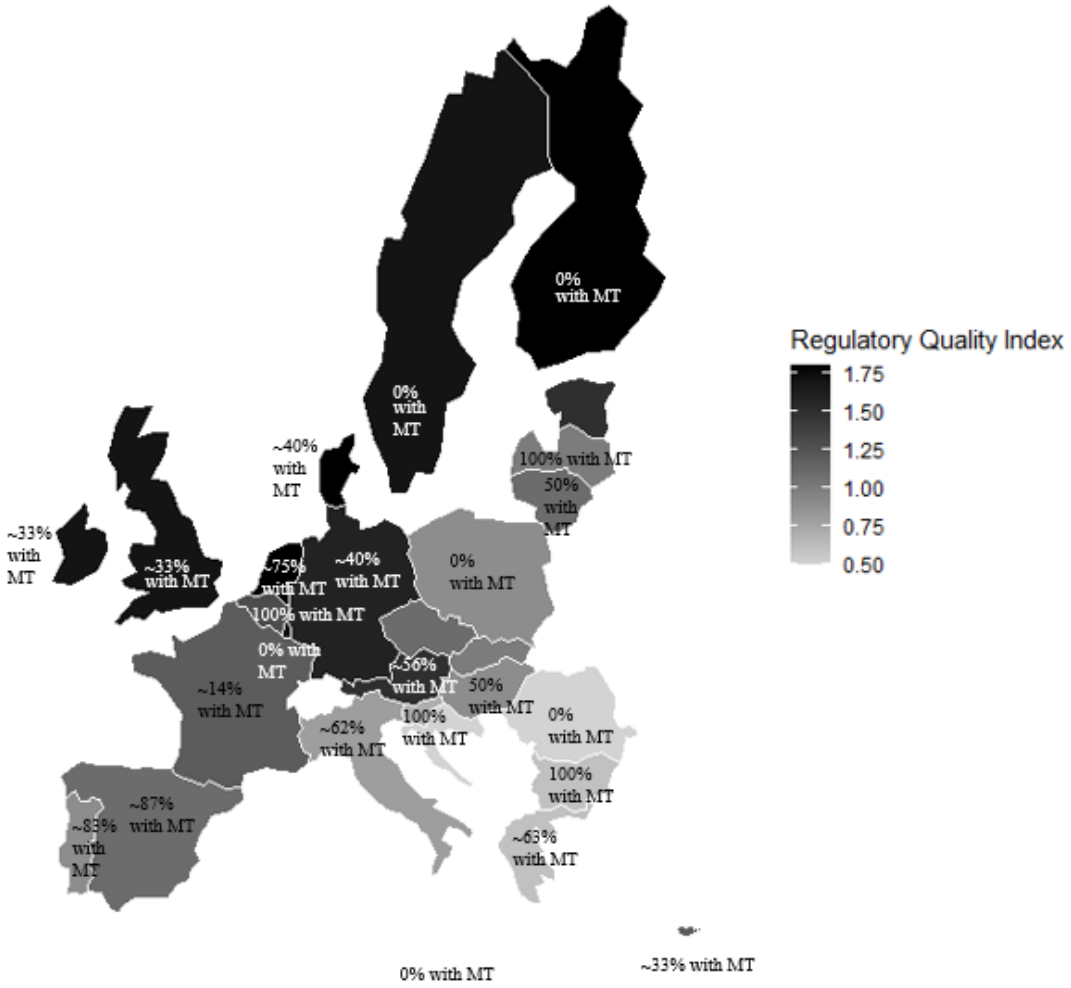


Figure 4: Geographical Distribution of Monitoring Trustees

This figure shows the geographical distribution of MTs across the different EU member states based on the starting sample of 122 banks with state aid. The percentage shows how many state aid bank cases were assigned with MTs. Like Gerhardt and Vennet [2017], several countries did not rescue banks because the banking sector is primarily foreign-owned. These countries include Estonia, Czech Republic, and Slovakia.



Tables

Table 1: Sample Composition

Panel A: Basic sample composition

This table shows the sample construction for the state aid banks with and without Monitoring Trustees (MTs) in the European Union from 2005 to 2018. The initial sample includes all banks with state aid that could have been identified. After considering missing financials (missing total assets and total gross loans) in the pre-crisis year 2004 and excluding Banco Espírito Santo S.A. due to an extremely high RoA value, 76 banks remain in the sample. The sample is partitioned according to the MT indicator variable, which is one for banks with MT and zeroes otherwise. Appendix B further describes the process of how MTs were identified. Other papers that cover EU state aid banks identified 114 over 2007-2013 (Gerhardt and Vennet [2017]) and 66 over 2000-2015 (Schaz [2019]) with naming the banks.

Sample selection		
	Full sample	*Notes*
Starting sample of banks	122	*Private and public banks in the European Union with state aid*
with MT (treated banks)	*66*	*54%*
without MT (control banks)	*56*	*46%*
Remaining banks	76	*Available financial data of total assets and gross loans in pre-crises year 2004 and following years*
with MT (treated banks)	*41*	*54%*
without MT (control banks)	*35*	*46%*

Panel B: Sample composition across countries

This table shows the distribution of banks across countries, the number of Monitoring Trustees (MTs) and the first year of state aid paid to a bank and the last year in which state aid was paid to a bank in the respective country.

Country	# of Banks with State Aid	# of Banks with MT	% of Total	Year of First State Aid	Year of Last State Aid	# of Remaining Banks	*% of Total*
Austria	9	5	56%	4th Qtr. 2005	1st Qtr. 2017	6	*8%*
Belgium	3	3	100%	4th Qtr. 2008	4th Qtr. 2008	2	*3%*
Bulgaria	1	1	100%	2nd Qtr. 2014	2nd Qtr. 2014	1	*1%*
Cyprus	3	1	33%	2nd Qtr. 2012	2nd Qtr. 2014	2	*3%*
Denmark	10	4	40%	2nd Qtr. 2007	1st Qtr. 2012	8	*11%*
Finland	1	0	0%	3rd Qtr. 2008	3rd Qtr. 2008	1	*1%*
France	7	1	14%	3rd Qtr. 2008	4th Qtr. 2017	5	*7%*
Germany	10	4	40%	3rd Qtr. 2007	2nd Qtr. 2009	9	*12%*
Greece	8	5	63%	2nd Qtr. 2009	4th Qtr. 2016	7	*9%*
Hungary	2	1	50%	1st Qtr. 2009	2nd Qtr. 2015	2	*3%*
Ireland	6	2	33%	1st Qtr. 2009	3rd Qtr. 2011	5	*7%*
Italy	13	8	62%	1st Qtr. 2009	1st Qtr. 2019	7	*9%*
Latvia	2	2	100%	4th Qtr. 2009	2nd Qtr. 2015	0	*0%*
Lithuania	2	1	50%	1st Qtr. 2012	1st Qtr. 2013	1	*1%*
Luxembourg	2	0	0%	2nd Qtr. 2009	4th Qtr. 2009	0	*0%*
Malta	1	0	0%	4th Qtr. 2014	4th Qtr. 2014	0	*0%*
Netherlands	4	3	75%	4th Qtr. 2008	4th Qtr. 2008	1	*1%*
Poland	2	0	0%	3rd Qtr. 2010	3rd Qtr. 2012	1	*1%*
Portugal	6	5	83%	4th Qtr. 2008	4th Qtr. 2015	4	*5%*
Romania	1	0	0%	1st Qtr. 2019	1st Qtr. 2019	0	*0%*
Slovenia	5	5	100%	1st Qtr. 2011	4th Qtr. 2013	4	*5%*
Spain	15	13	87%	4th Qtr. 2008	1st Qtr. 2014	5	*7%*
Sweden	3	0	0%	1st Qtr. 2006	2nd Qtr. 2009	1	*1%*
United Kingdom	6	2	33%	3rd Qtr. 2007	4th Qtr. 2011	4	*5%*
	122	66				76	

Table 2: Summary Statistics

Panel A: Comparison of state aid banks with and without monitoring trustees in the pre-crisis years 2004-2003

This table presents the descriptive statistics of the 76 state aid banks with (41) and without monitoring trustees (35) in the pre-crisis years 2004-2003 with 79 bank-years for MT banks and 68 bank-year for Non-MT banks. I provide detailed variable definitions in Appendix A together with sample construction steps in table 1 panel A. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level (two-tailed), respectively.

Summary statistics							
	MT banks			Non-MT banks			
Variables of interest	Mean	Med.	SD	Mean	Med.	SD	*Difference in Means*
LLP ratio	0.007	0.006	0.008	0.005	0.005	0.005	*0.002*
NPL ratio	0.015	0.003	0.022	0.721	0.009	4.046	*-0.706*
LLA ratio	0.021	0.016	0.021	0.016	0.009	0.020	*0.005*
Restatements	0.506	1.000	0.503	0.618	1.000	0.490	*-0.111*
Size	10.340	10.210	1.986	10.603	10.520	2.176	*-0.263*
Charge-off ratio	-0.001	0.000	0.002	-0.003	0.000	0.004	*0.001*
Consumer loans ratio	0.056	0.002	0.082	0.097	0.000	0.182	*-0.041*
Commercial loans ratio	0.314	0.223	0.321	0.194	0.136	0.208	*0.120***
Real estate loans ratio	0.001	0.000	0.001	0.006	0.000	0.019	*-0.005***
Tier 1 ratio	0.070	0.074	0.042	0.061	0.074	0.048	*0.009*
RoA	0.008	0.007	0.012	0.006	0.006	0.006	*0.001*
Loss	0.025	0.000	0.158	0.059	0.000	0.237	*-0.034*
Risk-weighted assets	0.390	0.411	0.356	0.319	0.347	0.294	*0.071*
Big4 Auditor	0.873	1.000	0.335	0.971	1.000	0.170	*-0.097***
Regulatory quality index	1.303	1.314	0.309	1.416	1.502	0.280	*-0.113***
Rule of law index	1.304	1.310	0.456	1.417	1.529	0.461	*-0.113*
Control of corruption index	1.338	1.357	0.674	1.493	1.459	0.688	*-0.156*
Government effectiveness index	1.400	1.353	0.540	1.506	1.540	0.510	*-0.106*
△GDP growth rate	0.008	-0.001	0.030	0.010	0.002	0.026	*-0.002*
△Unemployment rate	0.001	0.000	0.001	0.001	0.000	0.001	*0.000*

Panel B: Comparison of state aid banks with and without monitoring trustees

This table presents the descriptive statistics of state aid banks with and without monitoring trustees in the period from 2003-2018 for the sample of 76 banks and N=1,049 bank-years. I provide detailed variable definitions in Appendix A together with sample construction steps in table 1 panel A. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level (two-tailed), respectively.

Summary statistics												
	Bank-years	MT Banks					Non-MT Banks					*Difference in Means*
Variables of interest		Mean	Min.	Med.	Max.	SD	Mean	Min.	Med.	Max.	SD	
LLP ratio	1,049	0.014	-0.092	0.007	0.366	0.029	0.010	-0.025	0.005	0.702	0.035	*0.004*
NPL ratio	1,049	0.086	0.000	0.037	0.982	0.142	0.393	0.000	0.029	43.195	3.202	*-0.307***
LLA ratio	1,049	0.051	0.000	0.027	0.461	0.065	0.032	0.000	0.022	0.300	0.040	*0.019****
Restatements	1,049	0.484	0.000	0.000	1.000	0.500	0.496	0.000	0.000	1.000	0.501	*-0.012*
Size	1,049	10.795	4.948	10.872	15.145	1.926	11.273	5.069	10.952	14.911	2.098	*-0.478****
Charge-off ratio	1,049	-0.008	-0.205	-0.003	0.001	0.018	-0.005	-0.202	-0.002	0.000	0.012	*-0.003****
Consumer loans ratio	1,049	0.081	0.000	0.031	0.544	0.109	0.109	0.000	0.004	0.882	0.187	*-0.028****
Commercial loans ratio	1,049	0.347	0.000	0.298	0.944	0.295	0.216	0.000	0.171	0.997	0.225	*0.130****
Real estate loans ratio	1,049	0.001	0.000	0.000	0.009	0.001	0.004	0.000	0.000	0.110	0.011	*-0.003****
Tier 1 ratio	1,049	0.096	-0.067	0.093	0.403	0.058	0.117	0.000	0.090	3.041	0.220	*-0.021***
RoA	1,049	-0.001	-0.279	0.003	0.100	0.024	0.001	-0.179	0.003	0.092	0.017	*-0.002*
Loss	1,049	0.263	0.000	0.000	1.000	0.441	0.228	0.000	0.000	1.000	0.420	*0.035*
Risk-weighted assets	1,049	0.370	0.000	0.387	1.184	0.305	0.339	0.000	0.316	1.188	0.284	*0.032*
Big4 Auditor	1,049	0.920	0.000	1.000	1.000	0.272	0.927	0.000	1.000	1.000	0.261	*-0.007*

Panel C: Comparison of country variables of state aid banks with and without monitoring trustees

This table presents the descriptive statistics of the country-level variables as described by the World Bank with N = 1,049. I provide detailed variable definitions together with sample construction steps in Appendices A and B. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level (two-tailed), respectively.

Summary statistics											
	MT Banks					Non-MT Banks					*Difference in Means*
Variables of interest	Mean	Min.	Med.	Max.	SD	Mean	Min.	Med.	Max.	SD	
Regulatory quality index	1.187	0.148	1.191	2.047	0.438	1.401	0.148	1.522	1.925	0.366	*-0.214***
Rule of law index	1.213	-0.113	1.189	2.096	0.569	1.420	0.084	1.622	2.096	0.504	*-0.207***
Control of corruption index	1.142	-0.267	1.144	2.470	0.751	1.420	-0.189	1.593	2.470	0.696	*-0.278***
Government effectiveness index	1.199	-0.057	1.188	2.354	0.565	1.403	0.198	1.532	2.354	0.509	*-0.204***
△GDP growth rate	-0.011	-1.721	-0.002	0.249	0.146	-0.006	-1.721	-0.001	0.249	0.117	*-0.005*
△Unemployment rate	0.000	-0.002	0.000	0.009	0.002	0.000	-0.003	0.000	0.014	0.002	*0.000*

Panel D: Sample of state aid banks with and without monitoring trustees

This table presents the descriptive statistics about the state aid characteristics of the sample for the 76 banks (N=1,049). Apart from the duration of the state aid which accounts for the years a bank obtained state aid, all other variables are indicator variables if the state aid characteristic is met and zero otherwise. The specific description of variables used in this tables can be found in Appendix A. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level (two-tailed), respectively.

Summary statistics					
	MT Banks		Non-MT Banks		*Difference in Means*
State aid characteristics	Mean	Med.	Mean	Med.	
On-going state aid	0.697	1.000	0.537	1.000	*0.161***
Recapitalization	0.802	1.000	0.688	1.000	*0.114***
Guarantees	0.550	1.000	0.425	0.000	*0.126***
Asset relief measure	0.133	0.000	0.022	0.000	*0.112***
Liquidity assistance	0.145	0.000	0.205	0.000	*-0.059***
Duration	7.513	8.000	6.802	7.000	*0.711***

Table 3: Selection Criteria based on Observable Country- and Firm-Specific Attributes

Panel A: Selection based on country-specific attributes

This table provides the ordinary least square regression specification including year and country fixed effects with robust clustered standard errors being based years in (2) and country and years in (3) to identify statistically significant country-specific attributes for the assignment of Monitoring Trustees. The regressions are conducted in a stepwise manner, with the independent dummy variable being the bank with a monitoring trustee and zero otherwise. The complete list of the variable definitions is provided in Appendix A for variable definitions. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level (two-tailed), respectively.

	OLS		
Dependent variable	Monitoring Trustee		
Variables	(1)	(2)	(3)
Regulatory quality index	-0.495***	-0.347***	-0.261*
Rule of law index	0.460***	0.253***	-0.054
Control of corruption index	-0.055	-0.051	-0.083
Government effectiveness index	-0.083	0.044	-0.042
△GDP growth rate	-0.089	0.040	0.011
△Unemployment rate	-20.355***	-8.979	-6.467
Country FE	*No*	*No*	*Yes*
Year FE	*No*	*Yes*	*Yes*
N	1,049	1,049	1,049
R^2	0.066	0.220	0.312
Adjusted R^2	0.061	0.204	0.285

Panel B: Selection based on firm-specific attributes

This table provides the ordinary least square regression specification including year- and bank-fixed effects with robust clustered standard errors being based years in (2) and bank and years in (3) to identify statistically significant bank-specific attributes for the assignment of MTs. The regressions are conducted in a stepwise manner, with the independent dummy variable being the bank with a monitoring trustee and zero otherwise. The complete list of the variable definitions is provided in Appendix A for variable definitions. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level (two-tailed), respectively.

	OLS		
Dependent variable	Monitoring Trustee		
Variables	(1)	(2)	(3)
LLP ratio	-0.181	0.430	0.058
NPL ratio	-0.002	-0.001	0.001
LLA ratio	2.275***	1.323***	0.511**
Restatements	0.021	0.042*	0.004
Size	0.003	-0.010	0.031
Charge-off ratio	-3.417***	-2.107***	-0.116
Consumer loans ratio	0.185***	0.194***	-0.020
Commercial loans ratio	-0.146*	-0.163**	0.096
Real estate loans ratio	-2.856*	-3.623**	-0.016
Tier 1 ratio	0.122	-0.096	0.024
RoA	-0.753	0.055	-0.174
Loss	0.015	-0.028	-0.003
Risk-weighted assets	-0.079**	-0.047	-0.012
Big4 Auditor	0.041	0.026	-0.008
Recapitalization	0.139***	0.141***	0.655***
Guarantees	0.124***	0.113***	0.512***
Asset relief measure	0.264***	0.247***	0.324***
Liquidity assistance	0.043	0.047	0.163
Bank FE	*No*	*No*	*Yes*
Year FE	*No*	*Yes*	*Yes*
N	1,049	1,049	1,049
R^2	0.229	0.308	0.957
Adjusted R^2	0.215	0.286	0.952

Table 4: Monitoring Trustees and Loan Loss Reporting

This table reports ordinary least squares regression coefficient estimates examining the impact of the Monitoring Trustees (MT) on banks loan loss provisions, loan loss allowance, and non-performing loans in an unbalanced panel. I include year and bank fixed effects in the regressions. All control variables except asset relief measure and regulatory quality index are lagged. N shows the firm-year observations based on the 76 banks. All bank control variables apart from the regulatory quality index are lagged. The table reports ordinary least squares coefficient estimates and p-values based on robust standard errors clustered by banks. The constant is not reported. Given the sample size, variables are not winsorized. The specific description of variables can be found in Appendix A. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level (two-tailed), respectively.

Monitoring Trustee and Loan Loss Reporting						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	LLP Ratio$_t$	LLP Ratio$_t$	LLA Ratio$_t$	LLA Ratio$_t$	NPL Ratio$_t$	NPL Ratio$_t$
Test Variables:						
Monitoring Trustee	0.002	-	-0.004	-	0.309**	-
Post	0.006	0.009	0.011*	0.002	0.323**	0.072
Monitoring Trustee * Post	-0.001	-0.004	0.019***	0.019*	-0.070	-0.355
Control Variables:						
Size	-0.002***	-0.001	-0.007***	-0.024	0.008	-0.007
Tier 1 ratio	-0.007***	-0.003	-0.037***	-0.045*	-0.082	-0.040
Loss	-0.005	-0.006	0.023***	0.015***	0.166	0.031
RoA	-1.216***	-1.205***	-0.394*	-0.375***	-0.301	-2.063
Risk weighted assets	0.002	-0.002	0.007**	-0.008	0.806**	0.318
△GDP growth rate	0.001	0.001	-0.012	-0.017**	0.261	0.818
Consumer loans ratio	-0.003*	-0.003	-0.006	-0.010	-0.532*	0.066
Commercial loans ratio	0.015***	0.005	0.028***	0.007	-0.083	0.022
Real estate loans ratio	0.038	0.178	-0.578**	0.233	1.063	0.721
Asset relief measure	0.000	-0.002	-0.021***	-0.027***	-0.331	0.390
Regulatory quality index	-0.003	-0.006*	-0.036***	-0.098***	-0.429**	-0.038
Year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Bank FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
N	1,049	1,049	1,049	1,049	1,049	1,049
R^2	0.626	0.700	0.501	0.694	0.039	0.328
Adj. R^2	0.615	0.667	0.487	0.661	0.011	0.255

Table 5: Monitoring Trustees and Financial Restatements

This table reports ordinary least squares regression coefficient estimates examining the impact of the Monitoring Trustees (MT) on financial restatements in an unbalanced panel. I include year and bank fixed effects in the regressions. The table reports ordinary least squares coefficient estimates and p-values based on robust standard errors clustered by bank in (1)-(4). The specification followed the paper Jiang et al. [2016] in Table 5 which controls for size, capital, the lag value of the LLP, and the loss binary indicator variable. The specific description of variables used in this table can be found in Appendix A. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level (two-tailed), respectively.

Monitoring Trustee and Financial Restatements				
Dependent Variable:	(1) Restatements (all)	(2) Restatements (Income Statement)	(3) Restatements (Balance Sheet)	(4) Restatements (Cash Flow)
Test Variables:				
Monitoring Trustee	-	-	-	-
Time	0.164**	-0.019	0.135*	0.114
Monitoring Trustee * Time	0.027	0.108**	-0.021	0.131*
Control Variables:				
Size	0.101**	0.033	0.044	0.162***
Loss	0.058	0.061	0.009	0.067
LLP ratio	-0.863*	-0.414	-1.159***	-0.521
Capital ratio	0.753*	0.512**	0.613	0.454
Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Bank FE	*Yes*	*Yes*	*Yes*	*Yes*
N	1,049	1,049	1,049	1,049
R^2	0.193	0.238	0.222	0.167
Adj. R^2	0.112	0.161	0.143	0.083

Table 6: Subsample Analysis on Credit Risk Disclosures for Listed Banks

The table compares descriptive statistics of listed banks with (N=16) and without MTs (N=14) where the banks' annual reports' credit risk disclosures were analyzed over the period 2006-2016 to capture compliance with the demanded credit risk disclosures. N in the table shows bank-years for the subsample. A risk disclosure index score was constructed to capture compliance with IFRS 7 and Pillar 3 credit risk disclosures (like Bischof et al.2020a). IFRS 7 relates to the fiscal years beginning on or after January 1, 2007. The effective dates of Pillar 3 primarily fell in the 2007 to 2008 period with initial disclosures in the years 2008 and 2009. During 2008 and 2009, as can be seen in Figure 3, state aid cases accumulated and most banks in this subsample received state aid in 2008 or 2009. Of the 16 listed banks 8 disclose MTs in their annual reports, the average disclosure score of those banks is 15.98 vs. 18.39 of banks that do not disclose the MT in their annual report.

Panel A: Disclosures on credit risk for listed banks – 2006-2016

	MT Banks				Non-MT Banks				*Mean Difference*
Variables	*N*	*Mean*	*Med.*	*SD*	*N*	*Mean*	*Med.*	*SD*	
Size	165	12.06	12.42	1.64	154	12.04	12.30	2.50	*0.03*
Analysts	165	1.82	2.30	1.25	154	2.03	2.77	1.34	*-0.21*
Capital ratio	165	12.38	13.00	5.77	154	12.66	13.10	7.16	*-0.28*
RoA	163	-8.04	3.70	83.91	154	3.44	6.69	18.50	*-11.48*
Asset growth	165	0.02	-0.01	0.20	154	0.02	0.02	0.11	*0.00*
Regulatory quality	165	1.30	1.34	0.49	154	1.51	1.58	0.31	*-0.22****
Disclosure score	164	17.58	19.00	5.97	149	18.68	21.00	5.85	*-1.10*

Panel B: Disclosures on credit risk for listed banks – 2006-2016

	MT Banks with MT Disclosed				MT Banks without MT Disclosed				*Mean Difference*
Variables	*N*	*Mean*	*Med.*	*SD*	*N*	*Mean*	*Med.*	*SD*	
Size	55	11.52	11.20	1.46	110	12.33	12.70	1.67	*-0.81***
Analysts	55	1.51	1.95	1.33	110	1.97	2.48	1.18	*-0.46**
Capital ratio	55	11.98	12.50	5.01	110	12.58	13.50	6.13	*-0.60*
RoA	54	-17.69	5.88	138.74	109	-3.26	3.36	32.34	*-14.42*
Asset growth	55	0.03	-0.01	0.15	110	0.02	0.00	0.23	*0.02*
Regulatory quality	55	1.09	0.86	0.57	110	1.40	1.46	1.67	*-0.31****
Disclosure score	55	15.98	18.00	6.04	109	18.39	20.00	5.80	*-2.41**

Brief summary

This dissertation comprises three essays on the role of information and monitoring intermediaries in capital markets. The first essay investigates whether different short sellers vary in their selection of target firms using observable firm characteristics. Results show that hedge funds and investment managers on average prefer larger and younger firms, whereas banks focus on firms with fewer restatements and a higher leverage. The second essay provides descriptive evidence on how firms respond to activist short seller reports and how these responses are associated with outcomes for the targeted firms. It finds that the response rate increases substantially when the report is accompanied by significantly negative abnormal returns and when the short sellers provide new evidence which is consistent with the idea of short sellers acting as information intermediaries. Not responding is associated with a less negative stock price response when the report is released and fewer adverse outcomes. The third essay shifts the attention to Monitoring Trustees who assist in the supervision of banks that have received state aid in the European Union during the last financial crisis. It explores in a hand-collected sample the characteristics and duties of these newly implemented monitors and it studies the role of these supranational monitors and the banks' reporting behavior. Results suggest that these additional supervisors can influence the banks financial reporting transparency and reporting behavior when mainly loan loss reporting and restatements are accounted for.

The second essay has been published in the Journal of Accounting Research (https://doi.org/10.1111/1475-679X.12356).

Keywords: Information intermediaries, monitoring, short seller, monitoring trustees

Kurzzusammenfassung

Diese Dissertation umfasst drei Aufsätze über die Rolle von Informationsintermediären und Intermediäre mit Aufsichtsfunktionen in Kapitalmärkten. Der erste Aufsatz untersucht, ob sich verschiedene Leerverkäufer bei ihrer Auswahl von Zielunternehmen anhand von sichtbaren Merkmalen unterscheiden. Die Ergebnisse zeigen, dass Hedgefonds und Investmentmanager im Durchschnitt größere und jüngere Unternehmen bevorzugen, während sich Banken auf Unternehmen mit weniger Restatements der Finanzdaten und einem höheren

Verschuldungsgrad konzentrieren. Der zweite Aufsatz beschreibt, wie Unternehmen auf aktivistische Leerverkäuferberichte reagieren. Es wird festgestellt, dass die Antwortrate erheblich steigt, wenn der Bericht von deutlich negativen abnormalen Renditen begleitet wird und wenn die Leerverkäufer neue Beweise vorlegen. Dies stimmt mit der Vorstellung überein, dass Leerverkäufer als Informationsintermediäre fungieren können. Eine Nichtbeantwortung ist außerdem ist mit einer weniger negativen Aktienkursreaktion bei Veröffentlichung und mit weniger nachteiligen Ergebnissen verbunden. Die dritte Aufsatz fokusiert sich auf so-genannte Monitoring Trustees. Sie sind bei der Überwachung von Banken behilflich, die in der Europäischen Union während der letzten Finanzkrise staatliche Beihilfen erhalten haben. In einer von Hand gesammelten Stichprobe werden die Merkmale und Aufgaben dieser neu implementierten Aufseher und ihre Rolle im Zusammenhang mit dem Berichtsverhalten der Banken untersucht. Die Ergebnisse deuten darauf hin, dass diese zusätzlichen Aufseher die Transparenz und das Berichtsverhalten der Banken bei der Finanzberichterstattung beeinflussen können, insbesondere wenn die Berichterstattung über Kreditverluste und Anpassungen der Geschäftsberichte berücksichtigt werden.

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Schlüsselwörter: Informationsintermediäre, Aufseher, Leerverkäufer, Monitoring Trustees

Declaration of Academic Honesty

I, Janja Brendel, hereby declare that I have not previously submitted the present work for other examinations. I wrote this work independently. All sources, including sources from the Internet, that I have reproduced in either an unaltered or modified form (particularly sources for texts, graphs, tables, and images), have been acknowledged by me as such. I understand that violations of these principles will result in proceedings regarding deception or attempted deception.

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Janja Brendel | Berlin, 1 May 2021