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Corporate Scandals and Regulation

Law Working Paper N° 367/2017
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We appreciate the helpful comments of two anonymous referees, the many country experts, Sudipta Basu, Christian Leuz, and workshop participants at the 2017 JAR conference, Northwestern University, and University of Zurich. We thank Linda Aikala, Péter Aleksziev, Inês Bastos, Wilbur Chen, Joris de Kok, Manuel Engelmann, Rita Estêvão, Christos Grambovas, Seung Youb Han, Selina Hartmann, Jonathan Hori, Elisabetta Ipino, Keita Kana, Florian Klassmann, Benjamin Miller, Siladitya Mohanti, Andreea Moraru Arfire, Victor Musuku, Varun Sharma, Stefan Romeijn, Ido Spector, Josep Maria Vilà Calopa, Gabriel Voelcker, Halina Waniak, and Melody Xu for their excellent research assistance. We gratefully acknowledge financial support by Wharton's Global Initiatives Research Program (Luzi Hail), the Institute for New Economic Thinking (Ahmed Tahoun), and the Lawrence Revsine Research Fellowship of the Kellogg School of Management at Northwestern University (Clare Wang).

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Abstract

Are regulatory interventions delayed reactions to market failures or can regulators proactively pre-empt corporate misbehavior? From a public interest view, we would expect "effective" regulation to ex ante mitigate agency conflicts between corporate insiders and outsiders, and prevent corporate misbehavior from occurring or quickly rectify transgressions. However, regulators are also self-interested and may be captured, uninformed, or ideological, and become less effective as a result. In this registered report, we develop a historical time series of corporate (accounting) scandals and (accounting) regulations for a panel of 26 countries from 1800 to 2015. An analysis of the lead-lag relations at both the global and individual country level yields the following insights: (i) Corporate scandals are an antecedent to regulation over long stretches of time, suggesting that regulators are typically less flexible and informed than firms. (ii) Regulation is positively related to the incidence of future scandals, suggesting that regulators are not fully effective, that explicit rules are required to identify scandalous corporate actions, or that new regulations have unintended consequences. (iii) There exist systematic differences in these lead-lag relations across countries and over time suggesting that the effectiveness of regulation is shaped by fundamental country characteristics like market development and legal tradition.

Keywords: Accounting fraud, Corporate scandals, Capital market regulation, Economics of regulation, Law and finance, International accounting

JEL Classifications: F30, G18, G38, K22, L51, M48, N20

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ABSTRACT

Are regulatory interventions delayed reactions to market failures or can regulators proactively pre-empt corporate misbehavior? From a public interest view, we would expect "effective" regulation to ex ante mitigate agency conflicts between corporate insiders and outsiders, and prevent corporate misbehavior from occurring or quickly rectify transgressions. However, regulators are also self-interested and may be captured, uninformed, or ideological, and become less effective as a result. In this registered report, we develop a historical time series of corporate (accounting) scandals and (accounting) regulations for a panel of 26 countries from 1800 to 2015. An analysis of the lead-lag relations at both the global and individual country level yields the following insights: (i) Corporate scandals are an antecedent to regulation over long stretches of time, suggesting that regulators are typically less flexible and informed than firms. (ii) Regulation is positively related to the incidence of future scandals, suggesting that regulators are not fully effective, that explicit rules are required to identify scandalous corporate actions, or that new regulations have unintended consequences. (iii) There exist systematic differences in these lead-lag relations across countries and over time suggesting that the effectiveness of regulation is shaped by fundamental country characteristics like market development and legal tradition.

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"Government regulators—you can count on it—are always late to presumed 'problems' that are invariably fixed by market competition. Once again, if regulators could predict markets, they surely wouldn't be working as regulators." Tamny [2015], p. 126

1. Introduction

Can regulators proactively pre-empt corporate wrongdoing before it occurs? And do they detect and rectify actual misbehavior in a timely and persistent manner? To shed light on the issue of "regulatory effectiveness," we examine in this registered report the lead-lag relations between corporate (accounting) scandals and (accounting) regulation for a global sample of 26 countries over a period of more than 200 years.[1] This large historical panel lets us test whether corporate scandals are related to future regulatory actions, or whether the relation goes the other way, and past regulations systematically precede future corporate scandals. Such an analysis of temporal patterns allows us to draw partial inferences about the effectiveness of regulation, and how regulation has historically been shaped by corporate scandals (e.g., Nobes [1991]; Waymire and Basu [2007, 2011]). Given the high economic and social costs associated with corporate scandals, the importance of such considerations is clear. In monetary terms, the estimated annual cost of fraud among large U.S. corporations is US$ 380 billion or about 3 percent of the enterprise value of each firm (Dyck, Morse, and Zingales [2014]; see also Karpoff, Lee, and Martin [2008]). When the impact of lost public trust in financial markets is taken into consideration, the cost is even higher (Giannetti and Wang [2016]).

The political economy literature puts forward three main perspectives to help interpret the observed temporal patterns between corporate scandals and regulation. First, the public interest

[1] We focus on accounting regulation and accounting scandals involving private corporations, but do so in a broad sense. Thus, we also consider regulations and voluntary conventions regarding corporate governance and investor protection and, on the scandal side, incidents of financial frauds, embezzlements, investments schemes, tax evasion, etc. We do not include cases of political scandals and corruption or general financial crises. See section 2.1 for details. Henceforth, we interchangeably use the terms scandal, corporate scandal, and accounting scandal.

view argues that regulators are persons of character who seek public office to change policy and monitor market mechanisms in the best interest of the public (e.g., Pigou [1938]; Witman [1977]; Alesina [1988]; Previts and Merino [1998]; Diermeier, Keane, and Merlo [2005]; Callander [2008]). From this point of view, we would expect "effective" regulation to ex ante mitigate agency conflicts between corporate insiders and outsiders, and prevent corporate misbehavior from occurring. Where corporate misbehavior is ongoing or has already occurred, effective regulators would detect and rectify transgressions in a timely manner, and prevent such incidents from recurring. According to this view, newly introduced regulation should reduce the incidence of future corporate scandals and, from an ex post perspective, current corporate scandals should increase the enactment of future regulations. At the same time, there might exist positive serial correlation between today's regulations and future scandals in the short run, if it requires new rules for the regulator to become active and identify ongoing corporate actions as unlawful or in violation of public trust.

Under the second view, legislators and regulators respond to economic incentives in their best self-interest (see e.g., Stigler [1971]; Krueger [1974]; Peltzman [1976]; Kalt and Zupan [1984]; Frye and Shleifer [1997]; Mahoney [2003]; Mian, Sufi, and Trebbi [2010]; Tahoun and van Lent [2013]). They react to pressure from constituents, succumb to lobbying and other rent-seeking behaviors, and act, in general, to increase their personal utility. If for these reasons regulators are captured by the regulated,[2] their regulatory actions are unlikely to be effective in serving the public's interest (e.g., Stigler [1971]; Partnoy [1999]; Mahoney [2001]; O'Connor

[2] Regulatory capture can occur through materialistic or non-materialistic means. The former is known as financial capture and indicates that the regulator receives bribes or political donations from the regulated party that wants to maintain its government funding. The non-materialistic, cognitive capture occurs when the regulator's mindset is in sync with the regulated party due to intense lobbying (see e.g., Engstrom [2013]; Carpenter and Moss [2014]). Often, a lobbying coalition of "Baptists" (moral message) and "Bootleggers" (moneyed interests) forms and adopts both strategies to achieve their common goals (e.g., Yandle [1983]).

[2004]). It follows that new regulatory activity is unrelated or even positively related to the incidence of future corporate scandals, if those scandals benefit the special interests of the regulated firms (and, therefore, indirectly the self-interest of the regulators), or if managers are quick to adapt and shift their corporate wrongdoing to areas beyond the scope of the new regulation. Similarly, corporate scandals would not necessarily lead to an increase in the enactment of future regulations, and regulatory capture could even lead to a negative association with respect to future rule making.[3]

A third perspective on regulators' motivation is ideology (e.g., Kau and Rubin [1979, 1993]; Bernstein [1989]; Poole and Rosenthal [1996, 1997]; Lee, Moretti, and Butler [2004]). Ideological preferences, like a liberal versus conservative political leaning or a socialist versus capitalistic view of markets, can be used to explain many different regulatory actions. For instance, ideological opposition to markets might lead politicians to impose punitive legislation in the aftermath of a big corporate scandal, inducing a positive correlation between scandals and future regulatory interventions. Or, a Republican dominated U.S. Congress might pursue deregulation to further its political agenda, thereby potentially affecting the incidence of future scandals. In either case, the effectiveness of these regulations from a public interest view is unclear. Thus, on its own, this view is not of much help for the interpretation of the temporal patterns between corporate scandals and regulation. Yet, comparisons across countries and over time between more and less ideologically influenced regimes can provide insights into how special interest groups affect regulatory behavior (e.g., Rajan and Zingales [2003]).

[3] Incomplete information, incompetence, or lack of funding of the regulator also might contribute to regulation being ineffective. Moreover, given the broad historical scope of this study, period-specific factors such as the absence of regulatory bodies and/or regulation must be taken into consideration when interpreting our results. For instance, specific and enforceable regulation for financial reporting was largely absent in Belgium before World War I (Van Overfelt, Deloof, and Vanstraelen [2010]). Similarly, there did not exist a national legislation on financial reporting in Australia until the second half of the 20th century, and accounting standards were initially developed by competing professional accounting bodies without a clear enforcement structure (Dean and Clarke [2011]).

To test the above ideas, we develop in this registered report a time series comprising episodes of corporate scandals and regulation for a global sample of 26 countries over the period 1800 to 2015. We conduct the data collection in two steps. First, we use a coarse proxy of the underlying constructs and collect the number of times the terms "scandal" and "regulator" are mentioned in the leading (business) newspaper in each country and year. For instance, in the United Kingdom, we search for these two exact terms in the archive of the *Financial Times* from 1888 to 2015; in Italy, we search the archive of *La Stampa* from 1867 onwards for a series of equivalent Italian terms (i.e., "scandalo" together with "regolatore" and "legislatore"). The idea behind this broad search is to see whether the general topics of scandals and regulation produce newsworthy stories without further analysis of the newspaper content. In a second step, we refine our search and out of all the articles identify those that cover actual accounting scandals (i.e., financial reporting behavior by firms that is deemed morally or legally wrong and causes public uproar). This step assumes to a certain degree that the press plays a role as a watchdog for corporate misconduct (Miller [2006]), and involves an extensive content analysis of historical newspaper articles.[4] We collect data on accounting regulation from secondary literature and (official) depositories of the laws, rules, and voluntary conventions that cover financial reporting in a country. We use this information to create a country panel comprising the annual number of accounting scandals and regulations we identified in the press and from the other sources. We also code corporate scandals and regulations that go beyond the narrow scope of financial reporting but relate to firm value and the protection of minority investors. This large panel of historical data allows us to examine the lead-lag relations between corporate scandals and

[4] As the famous unravelling of Bernie Madoff's Ponzi scheme in 2008 illustrates, the watchdog role of the media is not obvious. Both the U.S. Securities and Exchange Commission (SEC) and the media only took a critical interest in Madoff after the markets forced him to liquidate his funds, despite repeated earlier attempts by whistle-blowers to alert the SEC and the press to his questionable investment practices (Markopolos [2010]).

regulations, and from the observed correlations we can then draw inferences against the backdrop of the theories of public interest, regulatory capture, and ideology of regulation.[5]

We begin the analysis with descriptive evidence on the occurrence of corporate scandals and regulation over time. On an aggregate level, the media mentions of the terms "scandal" and "regulator" steadily increase from numbers in the double digits in the early 1800s to about 5,000 just before World War II. The media mentions exponentially grow from 1946 onwards and exceed 34,000 in 2002 and 2006. The two time series are highly correlated, and closely mirror the expansion of wealth in the global economy, measured by the average gross domestic product (GDP) per capita of the sample countries. The media mentions also spike during times of global financial crises (Reinhart and Rogoff [2011]). Even though the numbers are markedly smaller when we focus on the actual incidents of corporate scandals and regulations, the general pattern we observe over time is very similar. There are, on average, 4.2 (2.4) episodes of corporate scandals (regulation) in any given year from 1800 to 1969, and this number increases to 33.1 (14.7) over the 1970 to 2015 period. Thus, frequent scandals covered in newspapers and extensive regulation are a relatively recent phenomenon. At the same time, we observe different waves of scandals and regulation over time, for instance, around 1860 (U.K. banking crisis), 1890 and 1905 (second industrial revolution), and 1930 (Great Depression). The years 1993 (e.g., Metallgesellschaft, Montedison, Banco Español de Crédito) and 2002 (e.g., WorldCom, Dynegy, ComRoad) display the highest numbers of scandals (69 and 82).[6] In total, we identify 2,244 corporate scandals (888 of which are pure accounting scandals) and 1,081 regulations (613

[5] The various theories of regulation are not mutually exclusive but rather coexist in the same market and/or form intermediate cases (Shleifer [2005]). Moreover, even though our empirical strategy allows us to identify the direction of the relation, we caution that we cannot unequivocally attribute the observed serial correlations to a specific theory.

[6] See the Internet appendix (http://ssrn.com/abstract=2960069) for details on the data collection and the time-series pattern of media mentions, corporate scandals, and regulation for each of the 26 sample countries.

accounting regulations), or on average at least one corporate scandal (regulation) every 3.4 (4.9) years in a country.

Going beyond a descriptive analysis, we next exploit the rich panel dimension of our data to examine the lead-lag relations between corporate scandals and regulations. Following Reinhart and Rogoff [2011], we test whether one time series is useful in forecasting the other after controlling for its own lagged values (Granger causality test). We find that the media mentions of both the terms "scandal" and "regulator" exhibit high positive autocorrelation, indicating that past mentions in the press are related to future mentions of the same term. Except for the most recent sample period (after 1970), the mentions of "scandal" lead the mentions of "regulator." At the same time, the opposite relation holds, and mentions of "regulator" lead mentions of "scandal." We find similar albeit statistically stronger patterns for actual episodes of corporate scandals and regulation. Both events exhibit a strong positive serial correlation. More to the point, corporate scandals are positively related to future regulation (even in our most restrictive model that includes year fixed effects), suggesting that they act as an antecedent to regulatory intervention. This correlation is consistent with regulators being less flexible and informed than firm managers and, consequently, taking a reactive approach to regulation. However, on its own, the relation does not tell us whether regulation has been effective. It could represent the benevolent regulator trying to quickly fix the problem, the captured regulator hiding behind regulatory activism, or the ideological regulator imposing an imprint. We also find that regulation acts as an antecedent to future scandals. This positive correlation suggests that regulators are not fully effective because, for instance, regulations are not properly enforced (e.g., Christensen, Hail, and Leuz [2013, 2016]), or firms might direct their misbehavior to areas outside the scope of the new regulation (e.g., Dye, Glover, and Sunder [2015]). Maybe only the

existence of explicit rules lets the regulator identify corporate actions as unlawful and in violation of public trust. The results are robust to controlling for economic development, inflation, the occurrence of financial crises, and country and year fixed effects. They also hold, but are weaker (particularly, for the relation of scandals leading regulation), when we limit the analyses to the subset of accounting scandals and accounting regulations.

In additional analyses, we check for differential lead-lag relations between corporate scandals and regulation over time, across groups of countries, and for individual countries. We find that the leading role of scandals is only present after 1946, but then again vanishes in the early 1970s. Regulation acts as an antecedent to scandals both before and after World War II, but loses its predictive power in the most recent period after 1970. One issue with the last five decades is that corporate scandals and regulations become very frequent events, reducing the identification power of the tests. The leading role of scandals is more pronounced in emerging markets and countries with weak rule of law (based on the La Porta, Lopez-de-Silanes, Shleifer, and Vishny [1998] index).[7] This finding is consistent with regulation being less able to curb the occurrence of future corporate scandals in those environments, even though the regulatory response—on paper—has been intense. We also find that the reactive role of regulation is particularly pronounced in English common law countries and German commercial code countries, but not present in countries with French legal tradition. German commercial code countries exhibit the largest positive correlation between current regulation and future scandals. In a country-by-country comparison, the leading role of corporate scandals is significant in 14 out of 26 cases, most strongly in Israel, Greece, South Korea, and India. In all these countries, regulation is not significantly autocorrelated. Regulation is positively related to future scandals

[7] Partitions based on modern-day investor protection measures only reflect a snapshot, and do not capture the long-term evolution of the legal forces shaping the functioning of capital markets (e.g., Franks, Mayer, and Rossi [2009]).

in 15 countries, most notably in Spain, Israel, Denmark, and Austria. Thus, our analyses point to systematic differences in the time-series pattern of corporate scandals and regulation in the cross-section and over time, suggesting that the effectiveness of regulation is shaped by local institutional factors and fundamental country characteristics like market development and legal tradition. We also find evidence of spillover effects from past regulation and scandals across nations, for instance, from the United Kingdom or France to the other sample countries.

Aside from a novel dataset and descriptive evidence on the historical evolution of corporate misbehavior and regulation of financial markets for a broad cross-section of countries around the globe, our study contributes to the better understanding of the history, role, and functioning of regulation (e.g., McCraw [1984]). As anecdotal evidence suggests and our data confirm, regulatory activity has a strong reactive component. This pattern is sometimes referred to as the "crisis theory" of regulation.[8] Yet, we find no evidence that these regulations can curb corporate misconduct. Rather to the contrary, today's regulations are a strong predictor of future fraudulent behavior,[9] be it because firm managers are quick to adapt and move their activities to unregulated areas, or—from a more benevolent perspective—because regulators rely on exactly defined rules to identify and prosecute corporate wrongdoing. Another explanation for the positive correlation could be that well-intended regulations "backfire" and lead to negative

[8] Some prominent examples for this crisis theory of regulation are the British Joint Stock Companies Act of 1844 that followed widespread business failures and bankruptcies (Littleton [1933]), the 1933/34 U.S. Securities and Exchange Acts on the heels of the 1929 Stock Market Crash and the Great Depression (e.g., Benston [1973]), the creation of the China Securities Regulatory Commission (CSRC) in the wake of riotous protests by disgruntled investors during the infamous Shenzhen "8.10 incident" in 1992 (e.g., Wei [2009]), or the U.S. Sarbanes-Oxley Act passed in 2002 amid corporate scandals like Enron, WorldCom, etc. (e.g., Ball [2009]).

[9] Historically, several major (accounting) regulations preceded major corporate scandals. For example, the British Bubble Act was enacted in June 1720 before the bursting of the South Sea Bubble in September and October of the same year (e.g., Harris [1994]; Waymire and Basu [2007]). The U.K. Railway Regulation Act of 1844 preceded the Railway Mania of 1845/47 (Arnold and McCartney [2003]). Mandatory fair value reporting stipulated in the German Commercial Code of 1861 was reversed after fair values were found to contribute to a financial market bubble and crisis ("Gründerkrise") in the early 1870s (e.g., Richard [2005]; Hoffmann and Detzen [2013]).

unintended consequences (Merton [1936]).[10] Regardless of the motive, our evidence shows that corporate scandals follow past attempts at regulatory reform, which begs the question of how to break this "vicious cycle" of scandals followed by bouts of regulatory activism without consideration of the long-term effects on the economy as a whole (Waymire and Basu [2011]; see also Nobes [1991]). Finally, our study can be seen as adding the field of accounting to the transdisciplinary area of cliodynamics, which encompasses the mathematical modelling of historical processes and the construction and analysis of large historical databases.

This paper was part of the Registration-based Editorial Process (REP) implemented by *JAR* for its 2017 conference. The registered report covers the variable definitions, data collection procedures and research design (section 2), the data description and graphical analyses (section 3), the main lead-lag regressions of corporate scandals and regulation including the analysis of media mentions (section 4), and the analysis of different sub-periods from 1800 to 2015 (section 5.1). The analysis of various sub-sets of the 26 sample countries (section 5.2) and the country-by-country analysis (section 5.3) are planned supplementary tests. The robustness checks in table 7 and the tests for potential spillover effects across jurisdictions (section 5.4) are unplanned, and we added them after the conference. Section 6 concludes. We provide further details on the data collection and the individual countries in the Internet appendix.

2. Data Collection and Research Design

In this section, we develop a definition of our two main theoretical constructs, corporate (accounting) scandals and (accounting) regulation. We then describe how we apply the two definitions in the data collection procedure. We conclude by outlining the basic research design

[10] For examples of negative unintended consequences of recent accounting regulations, see Bushee and Leuz [2005], Leuz, Triantis, and Wang [2008], or Gao, Wu, and Zimmerman [2009].

that we use to examine the lead-lag structure between corporate scandals and regulation in our global panel dataset.

2.1. DEFINITIONS OF CORPORATE SCANDALS AND REGULATION

For the purposes of this study, we start with a theoretical focus on corporate scandals and regulations in the area of financial reporting and accounting, but then in the data collection broaden the scope of our search to also include related scandals and regulations that might affect the personal wealth and legal status of minority investors. We define an "accounting scandal" as the alleged or actual financial reporting behavior of a firm (or multiple firms) that is publicly condemned as morally or legally wrong and causes shock and upset among the general public. This definition contains several key elements.[11] First, for a scandal to be an *accounting* scandal, it must somehow relate to management's use of the financial reporting system in a way that objectively misrepresents the firm's underlying economics. Such aggressive reporting practices include, but are not limited to, overstating corporate assets and revenues, understating or omitting liabilities and expenses, and the use of complex accounting methods or operating structures to obfuscate and misdirect the flow of company funds.[12]

Second, for the accounting practices to be *scandalous*, they have to be condemned as morally or legally wrong. Going beyond the traditional statutorily-derived definition of financial misconduct (e.g., Karpoff, Koester, Lee, and Martin [2017]), the expression "morally wrong" refers to practices that attract intense public scrutiny or criticism, irrespective of their legality or conformity with contemporary accounting principles. An example would be the public outcry

[11] We derive our definition from various sources explaining the terms scandal (http://www.merriam-webster.com), accounting scandal (Jones [2011]), corporate fraud (Dyck, Morse, and Zingales [2010, 2014]), or financial misconduct (Karpoff, Koester, Lee, and Martin [2017]).

[12] The narrow definition of accounting scandals excludes other types of corrupt corporate behavior (e.g., insider trading, bribery, tax evasion, etc.) without an explicit financial reporting angle. However, we categorize these actions as *other scandals* (see section 2.2.2) and include them in our analyses.

that accompanied Enron's mark-to-market accounting for its energy trading business that lacked quoted prices and, therefore, allowed for largely discretionary valuations as well as its use of special purpose entities to shift legal liabilities off the balance sheet—both practices were largely within the boundaries of GAAP. The term "legally wrong" refers to accounting fraud, that is, intentional acts by individuals or management that occur outside of the regulatory framework and result in material misrepresentations of financial statements. If not yet proven, fraud is only alleged. An example of fraud that started out as alleged in the initial media coverage but then turned into actual fraud would be the backdating of employee stock options by U.S. tech companies in the mid 2000s.

Third, for the general public to be sufficiently *shocked* and *upset*, the accounting practices need to be economically significant and a prominent subject of the public discussion. Both aspects are difficult to define in precise terms. The first part, economic significance, is related to the concept of materiality in accounting, and means that the reporting misstatements must have the potential to mislead corporate outsiders in their decision-making. The second part requires the accounting practices to be a topic of discussion among, for instance, regulators, politicians, the business press, and the broader media.

The second construct underlying our analysis is "accounting regulation."[13] Generally speaking, regulation refers to the legal imposition of formal rules with the intent to modify the economic behavior of firms or individuals. Regulation takes various forms (e.g., Shleifer [2005]; Ball [2009]; Sunder [2016]); through explicit legislation, by the power of the courts like in common law countries, or by tasking government administrative bodies and/or private entities with the coordination, implementation, and monitoring of the rules. Accounting regulation is the

[13] We draw our definition from several sources like the OECD (https://stats.oecd.org/glossary/detail.asp?ID=3295), La Porta et al. [1998], La Porta, Lopez-de-Silanes, and Shleifer [2006], and Leuz and Wysocki [2016].

field of national and supranational laws, rules, and conventions that cover the preparation, content, presentation, and dissemination of accounting information, typically in the form of published financial statements. In a broader sense, it also encompasses regulation rendering financial statements more useful like rules on insider trading, the protection of shareholders and creditors, or the recovery of damages when the disclosed information is wrong or incomplete.

Accounting regulation derives from many sources, including company laws, securities laws, stock exchange-imposed requirements, legal precedents, and generally accepted accounting principles (GAAP).[14] We consider rules applicable to all publicly listed firms as well as industry-specific regulations where appropriate (e.g., due to their formative influence on broader regulations like the 1868 Regulation of Railways Act in the U.K., or because of their wide bearing within the industry like the risk disclosure requirements under the third pillar of the Basel II accord for financial services firms). Whenever possible, we include self-regulation like the formation of the American Institute of Certified Public Accountants or the Swiss Foundation for Reporting Recommendations. Such self-regulatory organizations were particularly relevant in the early sample period. We further include important auditing regulations (e.g., U.S. Auditing Standard no. 2 on the audit of internal control over financial reporting) as well as tax laws when there is conformity between book and tax accounting (e.g., the Municipal Income Tax Act of 1928 in Sweden that implicitly linked the two sets of accounts).

The notion of materiality also applies to accounting regulation. We regard the introduction of regulatory acts as material if they lead to substantive changes in the year-to-year reported accounting numbers or to an extension (reduction) of public filings and disclosures. The 2005 mandatory adoption of IFRS for firms traded on regulated markets in the European Union (EU)

[14] We do not consider social norms or informal relations like trust that might determine accounting practices and investor protection (e.g., Sunder [2005]; Franks, Mayer, and Rossi [2009]) unless they were codified and available in written form.

would be a prime example of a regulatory change that had far-reaching consequences for firms' reporting. SFAS 87 in 1985 on employers' accounting for pensions or SFAS 141 in 2002 on the accounting for business combinations under U.S. GAAP would be other examples (see e.g., Balsam, Haw, and Lilien [1995]).[15]

2.2. COLLECTION OF DATA ON CORPORATE SCANDALS AND REGULATION

Based on the above conceptual definitions, we develop a data collection protocol that allows us to operationally grasp our two constructs, and apply it to a broad cross-section of countries over a long time series. We distinguish between the sources that we rely on to gather the data, and the classification of the collected data. This procedure leads to the initial sample available for the empirical analyses.

2.2.1. Data Sources. To identify the sources for the data collection, we build on the work of existing studies on the topic (e.g., International Practice Executive Committee [1975]; Waymire and Basu [2007, 2011]; Previts, Walton, and Wolnizer [2010]; Jones [2011]) and collect extensive new materials from diverse primary and secondary sources. We then carefully scour each source for relevant events. Specifically, we perform the following three steps: (1) we review the related literature, (2) we systematically search the leading (business) newspapers in each country, and (3) we contact local experts for advice regarding additional materials and resources.

In the first step, we survey the academic and practitioner literature through a keyword search of library catalogues, online databases, and the use of Internet search engines. For each source, we conduct both a general cross-country search and a targeted search of individual countries

[15] To illustrate how we apply the materiality criterion, consider the many changes to U.S. accounting standards in the area of employee stock options (e.g., APB 25 in 1972, SFAS 123 in 1995, SFAS 123R in 2004). We only include the last change, SFAS 123R, in our data of U.S. regulations, because it was a change that drew intense public interest and ultimately had a big impact on firm's financials by requiring the expensing of employee stock options.

using a comprehensive list of terms (or their local equivalents).[16] The literature review yields numerous cross-country surveys and individual country studies in the form of books, journal articles, and websites. The episodes of corporate scandals and regulation identified through this review of secondary sources serve as the starting point for the coding of our database.

The second step comprises a systematic archival search of the historical editions of the local business press and other media outlets. For each sample country, we identify one or multiple leading daily newspapers (ideally with a business focus), and search their electronic archives using the same keywords (or their local equivalents) as listed above. Table 1 provides an overview of the newspaper outlets used by country, and lists their accessibility and the period covered by each source.[17] For instance, in France, our primary sources are the historical archives of *Le Figaro* (1826 to 1942) and *Le Monde* (1945 to 2015), two of the leading newspapers over time. We complement these general interest outlets with searches in the financial and business centric newspapers *Journal des Finances* and *Les Échos*, when these were available. In most cases, we hire and train research assistants at local universities to help us with this search. If electronically searchable newspaper archives are not available, we use hardcopies, microfilm versions, or electronic copies instead, and adapt our search strategy such that we still can identify the major corporate scandals in a country. For instance, in Portugal there are no electronically searchable newspaper archives available for large parts of the sample period. Thus, we skimmed every Friday edition or, when newspaper length shortened in the early years, the daily front page and business section of the newspaper *Diário de Notícias* on location at the National Library of

[16] Specifically, we use the following keywords: "accounting scandal," "accounting fraud," "corporate scandal," "corporate fraud," "financial misconduct," "accounting manipulation," "earnings management," "earnings manipulation," "creative accounting," "accounting regulation," "disclosure regulation," "securities regulation," and "securities law." In addition to the direct translations of these terms, we also use country-specific keywords such as "Companies Act" in the U.K. or "Securities and Exchange Act" in South Korea.

[17] We contact local academics to ensure that we use appropriate news outlets and translations of the terms in our search list of the online databases and news archives. Similarly, we investigate how the search terms might have changed over time due to the long sample period.

Portugal in Lisbon for events. For each potential scandal (and regulation) we identified, we conducted additional research to better understand the issues and help us with its classification. We also ensured that at least two members of the research team independently classified every scandal (and regulation), and then discussed and resolved the cases with disagreements.

In the third step, we contact local accounting experts, legal historians, or professional organizations to seek help identifying additional resources and gauging the quality of the data. That is, after we have assembled the initial dataset based on primary and secondary resources and reviewed it for consistency, we asked a local expert to assess the completeness and plausibility of the entries. For example, in the U.K., we contacted the financial reporting faculty at the Institute of Chartered Accountants in England and Wales (ICAEW) to help us review the U.K. dataset. We provide additional details on the secondary literature, the keyword search, the data sources, and the data collection for each sample country in the Internet appendix.

2.2.2. Data Classification. Because of the broad search terms, the identification of source materials yields a large number of corporate scandals and regulatory changes. This trove of data needs further vetting. To narrow our focus on scandals that are consistent with the conceptual definition, we ask the following four questions for each event: (1) Does the event involve one or more financial reporting practices? (2) Are these practices either morally wrong (e.g., aggressive or creative accounting) or legally wrong (i.e., alleged or actual accounting fraud) under local customs or jurisdiction? (3) Does the event trigger material (negative) consequences for corporate outsiders such as a drop in share prices, or subsequent bankruptcy? (4) Does the event cause a public outcry and discussion as witnessed by prominent coverage in local newspaper

outlets and subsequent examination in secondary literature? Only if we can affirmatively answer all four questions do we classify the event as a pure *accounting scandal*.[18]

If a corporate scandal does not directly involve financial reporting practices (or financial reporting only plays a minor role) and fails the first criterion (but meets the other three criteria), we classify it either as near accounting scandal or as other scandal. *Near accounting scandals* are incidents which do not involve material misrepresentations of financial statements, but for which accounting information likely played an important part in forming market participants' expectations about the firm. An example would be the asset stripping ploy that became famous as the "bottom of the harbor" tax avoidance scheme in Australia of the 1970s. It involved the engineering of financial accounts, but defrauding tax authorities was the main goal. We classify corporate scandals without an explicit or implicit accounting angle (e.g., insider trading, bribery, theft, investment schemes, etc.) that nonetheless have the potential to affect future regulation as *other scandals*. A famous historical example pre-dating our sample period would be the South Sea Bubble in 1720 that resulted in highly inflated prices of the South Sea Company stock (e.g., Waymire and Basu [2007]; Goetzmann, Labio, Rouwenhorst, and Young [2013]). Table 2 illustrates how we apply the above criteria with examples of U.K. events that we classified into the various categories of corporate scandals.

We apply similar principles to regulatory acts. We classify all laws, standards, and conventions dealing with the recognition and/or disclosure of corporate events in the financial reporting system as *accounting regulation* in a narrow sense. To assess materiality, we rely on

[18] Traditionally, financial misconduct includes actions such as the forced restatement of financial reports, securities class action lawsuits, or accounting and auditing enforcement releases by, e.g., the U.S. SEC or the China Securities Regulatory Commission. Our definition subsumes those cases but only if they are substantive enough and cause public outcry and discussion. Thus, we end up with only a small fraction of the cases shown in Karpoff et al. [2017] for the U.S. or in Hung, Wong, and Zhang [2015] for China.

accounting textbooks, legal texts, publications by the big international audit firms, local experts as well as on the extent of coverage of the regulatory acts in the business press.

We further distinguish between national and *supranational regulation*. The latter category encompasses regulatory acts that are decided upon by international governmental or private organizations (e.g., the European Commission, or the International Accounting Standards Board IASB), and subsequently agreed upon and adopted in the signing countries or transposed into national law. An example is the Transparency Directive passed by the EU legislature in 2004 that addresses corporate reporting and disclosure issues for firms traded on regulated EU markets. For these supranational regulations, the link between local economic conditions and the enactment of the law should be less pronounced (Christensen, Hail, and Leuz [2016]). Similarly, we expect weaker links between scandals and local regulations when the regulatory activity is heavily influenced by international events (e.g., the dissemination of the French Code through the Napoleonic wars) or colonial ties (e.g., the influence of British law in Australia or Canada), but we do not separately code these cross-country events (see also section 5.4 for evidence on potential cross-country spillover effects). We classify regulatory acts that do not directly cover financial reporting practices but still render financial statements more useful to corporate outsiders as *other regulation*. An example is the Prevention of Fraud Act enacted by the U.K. Parliament in 1939 to regulate the proliferation of newly listed companies at the time.

2.3. RESEARCH DESIGN

Our basic research design follows from Reinhart and Rogoff [2009, 2011].[19] The idea is to examine the lead-lag relations between our two main variables of interest, corporate scandals and

[19] Reinhart and Rogoff [2009, 2011] study the temporal patterns of debt and banking crises, stock market crashes, inflation and currency crises. Their study covers 70 countries in Africa, Asia, Europe, Latin America, North America, and Oceania and spans the period from 1800 to 2009.

regulation, to determine whether one time series is useful in forecasting the other after controlling for its own lagged values (Granger [1969] causality test). That is, we model the time series of corporate scandals as a function of its own past values and the past values of regulatory actions, and vice versa. The observed relations tell us something about the "predictive causality" between the two constructs. If past corporate scandals are related to future regulatory actions, we interpret this association as suggesting that lawmakers and regulators reacted ex post to corporate misbehavior. If past regulations are related to future corporate scandals, the association indicates that firm managers or owners are quick to avoid the new regulatory interventions and move to unregulated areas, regulators engage in regulatory activism, or regulators require explicit rules to become active, and detect and prosecute corporate misbehavior. Alternatively, the positive relation could point to negative unintended consequences of regulation.

Specifically, we estimate the following two separate equations based on the modified vector autoregression (VAR) in Reinhart and Rogoff [2011] for the analysis:

(1) $$SCANDAL_{it} = \beta_{10} + \beta_{11} SCANDAL_{i[t-1 \text{ to } t-3]} + \beta_{12} REGULATION_{i[t-1 \text{ to } t-3]} + \sum \beta_{1j}\, Controls_{jt-1} + \sum \beta_{1k}\, Fixed\ Effects_k + u_{1it}$$

(2) $$REGULATION_{it} = \beta_{20} + \beta_{21} SCANDAL_{i[t-1 \text{ to } t-3]} + \beta_{22} REGULATION_{i[t-1 \text{ to } t-3]} + \sum \beta_{2j}\, Controls_{jt-1} + \sum \beta_{2k}\, Fixed\ Effects_k + u_{2it}.$$

In this expression, $SCANDAL_{it}$ stands for a binary indicator variable that takes on a value of '1' if a new corporate scandal is discovered in country i and year t. We measure scandals in the year they are first discussed in the financial press and media, which might be different from the year that the misbehavior took place. However, to shape public opinion and motivate regulators to take actions (e.g., Miller [2006]), markets must be aware of the wrongdoing. $REGULATION_{it}$ is a binary variable that takes on a value of '1' if there is a new regulation enacted in country i and year t, and '0' otherwise. We measure regulation at the time it is enacted, which is less

subjective because we can more easily determine these dates for the historical time series. However, the entry-into-force date might be several months or even years past the initial discussion and the drafting of the regulation, at which time we would have expected the relation between past scandals and the incentives of the rule makers to be most pronounced.[20]

In both equations, we include a single lag of the three-year backward-looking moving average of the two dependent variables, $SCANDAL_{i[t-1 \text{ to } t-3]}$ and $REGULATION_{i[t-1 \text{ to } t-3]}$. These two lagged variables give rise to our coefficients of interest. If scandals are persistent, we expect β_{11} to be positive; a negative sign is consistent with corporate scandals coming and going in waves. β_{12} is a proxy for the predictive ability of regulation. A negative sign indicates that newly introduced regulation reduces the incidence of corporate scandals, which we would interpret as effective regulation from a public interest perspective. A positive coefficient suggests a leading role of regulation for the incidence and detection of future corporate misbehavior. In Eq. (2), β_{21} captures the nature of a regulator's reaction; a positive sign suggests that lawmakers and regulators react, ex post, to corporate misbehavior. That is, they did not see it coming, for instance, because they were less informed or notoriously late. The interpretation of a negative (or insignificant) sign is more ambiguous, but could indicate that regulators are captured by their constituents, and do not react or even curb regulatory efforts in response to corporate misbehavior. The coefficient β_{22} reveals something about the inner workings of the regulatory process. If regulation is purely ad hoc and primarily driven by economic conditions, we would not expect a significant association. A positive sign suggests an increasing trend in regulatory activity, consistent with a self-interested regulator attempting to increase his realm (Peltzman [1976]). It is also consistent with prior regulation not being enough and requiring amendments or

[20] To allow for such a potential delay, we rerun the analysis by further lagging the moving average variables by one or two more years. The results are very similar and none of the inferences change (see also the sensitivity tests in table 7).

new regulation to resolve pressing issues. A negative coefficient indicates mean reversion in regulatory activity.

In the base specification, we include lagged values of log transformed GDP per capita and inflation as time-varying, country-specific control variables plus country fixed effects. We include them to control for cross-sectional differences in economic development and general economic conditions. GDP captures economic growth including the wealth of the economy and the development of capital markets (La Porta et al. [1998]). Inflation captures macroeconomic stability and often coincides with exchange rate crises, debt and banking crises (Reinhart and Rogoff [2011]). In some specifications, we further include a control for the occurrence of a financial crisis in a country as well as year fixed effects. The year-fixed-effects estimation is conservative, as the yearly dummy variables account for general trends in the data inclusive of those related to our variables of interest. We estimate the equations with logit regressions and report statistical significance levels based on robust standard errors clustered by country.

3. Data Description and Graphical Analyses

In this section, we discuss the sample construction and provide descriptive statistics on the number of corporate scandals and regulations by country and year. We then analyze the data using graphical plots to get a better understanding of the historical development of the two main constructs under study and their interrelations over time. We conclude the section with an illustrative description of the data structure for select sample countries.

3.1. SAMPLE CONSTRUCTION AND DESCRIPTION

We start with Jones [2011] for our sample selection process. In his book, he identifies and describes accounting scandals occurring in 12 different countries, spanning Asia, Europe, North

America, and Oceania. We supplement this list with the 11 next largest countries in terms of GDP that are part of the Organization for Economic Co-operation and Development (OECD).[21] Finally, we add Brazil, Egypt, and South Africa to also include representatives from Latin America and Africa in the sample. This procedure yields our final sample of 26 countries.

We apply our data collection protocol to the sample countries as far back as 1800 if possible.[22] For each country, we construct an input database that contains the number and types of corporate scandals and regulations in a given year together with a short description and a reference pointing to the original source material. For the analyses, we use the raw data to create the two variables *SCANDAL* and *REGULATION* that we code as '1' if we identified at least one incident of corporate scandals or accounting regulations in a country and year.[23]

In table 3, we provide descriptive statistics on the sample that results after our data collection. Panel A reports the starting year, the number of country-year observations, and the incidents of corporate scandals and regulation on a country-by-country basis. Except for Israel (1932), Poland (1920), and South Korea (1920), all the historical time series start in the 19th century, going back as far as 1800 for Austria, Switzerland, and the U.K. The maximum time series per country is 216 years with a mean of 157 years. This expansive historical data is essential for the power of the statistical tests. The total sample comprises 4,071 country years. In terms of count, the U.S., Japan, and the U.K. exhibit the highest number of corporate scandals,

[21] Mexico, Norway, and Turkey also rank among the OEDC countries with high GDP, but could not be included in the sample. Similarly, Argentina, which is not a member of the OECD but has a larger GDP than some of the sample countries, is not included. Unfortunately, after multiple attempts with several research assistants we were unable to collect reliable newspaper data on scandals for these four countries, so that we had to drop them from our original research proposal submitted to the REP.

[22] For some countries, data on corporate scandals and regulation are available even before 1800. However, in most cases we cannot systematically gather data until the second half of the 19th century. Thus, we set the country-specific sample period to the later of 1800 or the initial year with reliable newspaper and/or secondary literature coverage.

[23] We identified only 13 events in the data collection that clearly can be characterized as deregulation (i.e., a substantial loosening or repeal of existing regulation). We did not include these events in the main analyses. However, if we do and code deregulations as '-1' to re-estimate the model with multinomial logistic regressions, the results are virtually unaffected (not tabulated), and none of the inferences change.

with more than 200 incidents each. At the other end of the spectrum, we have Israel and Finland with 15 and 16 cases, respectively. The total number of corporate scandals we could identify is 2,244. On average, we count 86 cases per country (of which 34 are pure accounting scandals). One caveat with the interpretation of these numbers is that in some cases, episodes that involve multiple firms—sometimes in the hundreds—are lumped into a single event (e.g., the 1845 U.K. Railway Mania, 1873 Gründerkrise in Germany, or 2014 Operação Lava Jato in Brazil). In terms of regulatory activity, the total number is 1,081 (mean of 42 events per country) with 613 (mean of 24) having a direct impact on firms' financial reporting. Italy is the country for which we identified the greatest number of regulatory events (63), while Poland had the fewest (19).

In panel B of table 3, we report the number of country-year observations together with the incidents of corporate scandals and regulation by decade. The number of corporate scandals is very low in the early years, which also is a function of having fewer sample countries at the time. It then gradually increases until the 1960s (with a peak during the Great Depression around 1930). Over the last 45 years, the number of corporate scandals surges and reaches a peak with 82 cases in 2002 (1993 with 69 cases is the second most populated year). The time-series pattern for regulatory activity is similar. 2005 (51 events) and 2002 (33 events) are the years for which we could identify the most regulations. On average, there are 4.2 (2.4) episodes of corporate scandals (regulation) in any given year from 1800 to 1969, and this number increases to 33.1 (14.7) over the 1970 to 2015 period.

Table 4 presents descriptive statistics for the binary *SCANDAL* and *REGULATION* variables used in the regression analyses. The variables are coded such that any incident of scandal or regulation in a country and year sets the indicator variable to '1'. We observe pure accounting scandals (as indicated by the suffix *_acctg*) in 13 percent of the country-years. Adding near

accounting scandals (*_acctg+near*) raises this proportion to 20 percent; and including other scandals (*_tot*) to 29 percent. The numbers for pure accounting regulation (*_acctg*), accounting plus other corporate governance and/or investor protection regulation (*_acctg+oth*), and all regulation including supranational agreements and laws (*_tot*) are 13, 20, and 21 percent, respectively. These percentages suggest that we observe, on average, every 3.4 (4.9) years at least one corporate scandal (regulation) in a country. The table also contains descriptive statistics on the media mentions of scandals and regulation and the control variables for economic development (*GDP per Capita*), *Inflation*, and *Financial Crisis*, which we describe in more detail below.

3.2. GRAPHICAL PLOTS OF CORPORATE SCANDALS AND REGULATION

First, we use a coarse proxy of the underlying constructs and collect the annual number of times the terms "scandal" and "regulator" (or the local equivalents) are mentioned in the leading (business) newspaper in each country. The idea behind this broad search is to see whether the general topics of corporate scandals and regulation produce newsworthy stories without further analysis of the specific content of the articles. For instance, in the United Kingdom, we search for the two exact terms in the archive of the *Financial Times* from 1888 to 2015; in Italy, we search the archive of *La Stampa* from 1867 onwards for a series of equivalent Italian terms (i.e., "scandalo" together with "regolatore" and "legislatore"); in the Netherlands, we search the *Algemeen Handelsblad* beginning in 1828 using the Dutch terms for scandal and supervisory body/company law (i.e., "schandaal" and "toezichthouder", "ondernemingsrecht", "wet" in combination with "onderneming", "firma", "compagnie", or "vennootschap"). See also table 1 for the newspaper resources and the Internet appendix for the exact keywords used.

In figure 1, we plot the aggregate number of media mentions of the two terms over the 1800 to 2015 period. The graph is based on 24 (out of 26) countries because we have no media mentions data for Portugal and Egypt. To provide context, we include the country-median GDP per capita in the graph and highlight periods of global financial crises.[24] The figure allows the following insights: First, the mentions of scandal and regulator follow a distinct pattern over time. They grow almost proportionately over many years at low rates, but start to exponentially increase beginning after World War II. This pattern could reflect the fewer accessible newspaper sources in the early decades, sample bias from adding more countries over time, or longer newspapers with more articles and heightened media attention to the two topics in recent years. However, as the strong positive correlation between media mentions and GDP per capita (97 percent) suggests, there might also exist some common underlying forces such as economic development or the growing role of capital markets over time that might jointly determine the evolution of the two time-series. Second, the media mentions of scandal and regulator closely mirror each other. The Pearson correlation coefficient between the two time series is close to 99 percent over the entire period and only slightly smaller for various sub-periods. This strong comovement suggests that the two constructs are often mentioned in the same context, supporting our notion of the press as a watchdog (Miller [2006]). Third, there exist discernible waves in the mentions of scandal and regulator by the press, and they tend to coincide with financial crises. We observe a surge in media mentions around 1910 (various national crises like the panic of 1907 in the U.S. or the 1910 rubber stock crisis in China), in the 1930s (Great Depression), 1973 (oil crisis), 1987 (Black Monday stock market crash), early 2000s (burst of

[24] We define global financial crises as years in which more than two-thirds of the sample countries at the time experienced at least one crisis of the following type: bank crisis, stock market crash, currency crisis, inflation crisis, or sovereign debt crisis (source: Reinhart and Rogoff [2011]).

the dot-com bubble), etc. Thus, newspaper outlets seem to be a timely source for our underlying constructs.

Next, we refine the analyses and focus on the episodes of actual corporate scandals and regulation. That is, we zoom in on those events that we could identify in our extensive content analysis of the newspaper coverage, and plot the aggregate yearly numbers for the 26 sample countries in figure 2. Panel A shows results for all kinds of corporate scandals and regulatory actions; panel B limits the plot to pure accounting scandals and regulations. The time-series patterns closely resemble the media mentions. The incidents of corporate scandals steadily grow but remain at substantially lower levels until about the 1970s, when the numbers start to starkly increase. Scandals reach their highest level in 1993 (e.g., Metallgesellschaft, Montedison, Banco Español de Crédito) and 2002 (e.g., Enron, Worldcom, Dynegy, ComRoad). The heightened frequency of corporate scandals in recent years is highlighted by the shaded area in the graphs. We define periods of global corporate scandals as years in which more than half of the sample countries experienced at least one episode of scandal. Except for 1931, they all occur after 1988. We observe several waves in corporate scandals going back as early as the 1860s (U.K. banking crisis), 1890 and 1905 (second industrial revolution), and the 1930s (Great Depression). The regulatory activity follows a similar path, consistent with the notion that regulation has become much more prevalent today than it was 100 years ago (Shleifer [2005]). The correlation between the incidents of scandals and regulation is high, with 87 percent over the entire period and between 64 to 78 percent over various sub-periods.

The time-series pattern for accounting scandals and regulation in panel B is very similar, but at lower levels. Notably, we could not identify many accounting scandals before 1900 (only 63 cases), and the vast majority took place after 1960 (701 cases). This finding does not come as a

surprise as strict and enforceable regulation regarding financial reporting often was absent before the 1930s (e.g., in the U.S. before the 1933/34 Securities and Exchange Acts). Aside from being unspecific and broad, early accounting regulation often came in the form of social norms, voluntary agreements, and systems of self-regulation (e.g., Waymire and Basu [2007]), which were difficult to uniformly implement and enforce. Moreover, the increasing role of capital markets, long boom periods of rising stock prices, market pressure on management to perform in the short-run, executive compensation tied to stock prices, etc. has made the accounting system more prone to fraudulent behavior in recent decades (e.g., Ball [2009]). Despite the high time-series correlations between scandals and regulation in both figures 1 and 2, the graphical analysis does not allow insights into the lead-lag structure between the two constructs.

3.3. EXAMPLES OF INDIVIDUAL COUNTRY DATA

To get a better understanding of our data structure, we provide graphical details on the corporate scandal and regulation data for four sample countries. For each country, we plot the time series of media mentions of the terms "scandal" and "regulator" (as solid and dashed lines) together with the yearly incidents of corporate scandals and regulations that met our definition (vertical bars). In figure 3, we plot the results for the United Kingdom over the 1800 to 2015 period. The time series of media mentions does not start until 1888, the founding year of the *Financial Times*, which we use as our main newspaper resource in the U.K. The media mentions display the already documented exponential growth beginning in the early 1970s.[25] The correlation between the two time series of media mentions is high (92 percent) over the entire

[25] The pattern of media mentions remains largely the same if we include the broader terms "fraud" and "regulation" in the search. Similarly, if we scale the number of media mentions by the total number of articles published in the *Financial Times* in a year (to address concerns about the broadening scope of newspaper coverage over time), the pattern is largely unchanged.

period, but non-existent before World War II. The pattern of actual scandals and regulation is more balanced in the U.K. than in the full sample as about half the incidents occur before 1970.

Figure 4 displays the data structure for the United States over the 1851 to 2015 period. The media mentions of scandals in *The New York Times* are very volatile, and we observe multiple waves over time, the first in 1870, the second around the turn of the century, the third around 1930, and then again in the mid 1950s, 1960s, and 1970s. Thereafter the level of media mentions of both terms substantially increases. The correlation between the two time-series is on the order of 70 percent for the entire period and after World War II, but only 25 percent before 1946. The pattern of actual scandals and regulation largely mimics the media mentions, with select individual cases over long stretches of the sample period and a substantial increase after 1970. 2002 is a banner year with 26 cases of corporate scandals and 4 regulatory events.

Figure 5 reports the data structure for China over the 1878 to 2015 period. We use the two newspapers *Shen Bao* (until 1948) and *People's Daily* (from 1949) as our main resources for the data collection. China is as an example of a country that historically has been subject to strong government control over the press, ideology-driven political agenda setting, and central planning of the economy. Thus, it is not obvious whether the same patterns would emerge as in some of the western markets. However, the data reveal very similar time-series attributes. The number of media mentions displays three notable peaks, the first in 1934 (spike in World silver price), the second in 1946 (hyper-inflation), and the third and most sustained in 2004 (corporate scandals). The correlation between the mentions of scandal and regulator is strongly positive over the entire period and over the various sub-periods (always higher than 67 percent). The occurrence of actual scandals closely mimics the pattern of media mentions and is similar to the more market-based economies (i.e., only 29 cases before 1990 and 98 cases thereafter).

Figure 6 plots the data structure for Italy over the 1860 to 2015 period. *La Stampa*, one of the oldest daily newspapers in Italy, serves as the primary data source. The two time series of media mentions move closely together (correlation of 92 percent), are volatile with several peaks over the course of the years, and generally display the familiar pattern. Notably, the incidents of actual scandals and regulation closely follow the media mentions. There are groups of scandals (and surges in media mentions) around 1910, 1930, and on a more persistent basis after 1950. Both actual corporate scandals and media mentions of scandals peak in 1993 (e.g., Montedison, Eni, Finmeccanica). We can use the year 1993 to illustrate our research question. The issue becomes whether the accumulation of scandals in this year served as trigger for future regulatory action, for instance, the two rules put in place in 1995. Alternatively, the scandals of 1993 could be an outcome of prior regulations, like the rules enacted over the years 1990 to 1992. We turn to a statistical analysis of such lead-lag relations in the next section.

4. Temporal Patterns of Corporate Scandals and Regulation

4.1. MENTIONS OF "SCANDAL" AND "REGULATOR" IN THE BUSINESS PRESS

We start the empirical tests with an analysis of the temporal patterns of the media mentions of "scandal" and "regulator." Even though these proxies are noisy and potentially biased, they can give us an indication of the lead-lag structure of the underlying theoretical constructs. We estimate the models in Eq. (1) and (2), but instead of using binary indicator variables we use the log transformed numbers of the yearly media mentions in a country as the dependent variables. Similarly, we compute the lagged moving averages from three years of media mentions and then log transform them for the estimation. This specification implicitly puts more weight on scandals and regulations that received more media attention and likely were more important (e.g., the

1933/34 U.S. Securities and Exchange Acts or the 2001 Enron scandal). The models control for economic development, inflation, and country fixed effects. Annual *GDP per Capita* (in 1990 international dollars) is from the Maddison-Project; yearly *Inflation* from the online resources to Reinhart and Rogoff [2011].[26] We estimate the models with ordinary least squares (OLS) regression and assess the statistical significance based on robust standard errors clustered by country.

Table 5 presents OLS coefficients and (in parentheses) *t*-statistics from estimating the two models, first over the entire sample period (1800-2015), and then consecutively over the first half of the sample (1800-1945), the second half of the sample (1946-2015), and the most recent decades (1970-2015). We gain the following insights. First, we find that the media mentions of both the terms "scandal" and "regulator" exhibit high positive autocorrelation, indicating that past mentions in the press are related to future mentions of the same term. The interpretation of the log-log model is straightforward. The coefficients on the lagged moving averages of *SCANDAL_media* and *REGULATOR_media* on the order of 0.82 to 0.93 correspond to percentage changes. A one percentage change in past scandals (regulations) translates into a 0.82 to 0.93 percentage change in future scandals (regulations). Thus, the attention the media pays to these two constructs is sticky over time. Second, focusing on the right-hand side of the table, the coefficient on lagged scandals is significantly positive in the *REGULATOR_media* model of column (1). The finding suggests that media coverage of scandals serves as an antecedent to media coverage about regulation. However, the effect is small with a one percentage change in

[26] Data for *GDP per Capita* and *Inflation* are missing for some of the historical country-years. We linearly extrapolate missing years from adjacent observations to fill gaps in the time series. If the gaps are too long (i.e., > 10 years) or precede the available data, we backfill the missing data by using the annual percentage changes from a peer country with high observed correlations in subsequent years. For example, we backfill Germany's *GDP per Capita* data before 1850 using the U.K.'s growth rates in GDP per capita for the same period. We chose the U.K. because the correlation between the two countries is 96 percent over the 1850 to 1880 period.

media mentions of "scandal" leading to a 0.03 percentage change in media mentions of "regulator." Third, based on the left-hand side of the table, the coefficient on lagged regulation is significantly positive in column (1) of the *SCANDAL_media* model. Thus, media coverage of regulation is followed by higher media coverage of scandals. The effect is highly significant and the coefficient magnitude suggests that a one percentage change in media mentions of "regulator" leads to a 0.06 percentage change in the mentions of "scandal." The positive and significant coefficient on *GDP per Capita* indicates a positive impact of economic development on the coverage of the two topics by the press.

The results for the various sub-periods in columns (2), (3), and (4) show that the leading role of past media mentions of "scandal" for the future press coverage of "regulation" is present in both the first and second half of the sample period, but vanishes in the most recent years after 1970. This latter sub-period is when the leading role of past media mentions of regulator for future scandals is statistically most pronounced. The coefficient is only marginally significant at the 12-percent level in the period before World War II. Overall, the analysis of media mentions displays many of the expected relations, even though mere press coverage of our broad search terms arguably is a coarse and noisy proxy of the underlying constructs. In that sense, we see these tests as an independent validity check of our main analyses.

4.2. ACTUAL EPISODES OF CORPORATE SCANDALS AND REGULATION

We now turn to the analysis of the lead-lag structure of the actual episodes of corporate scandals and regulation that we identified in the comprehensive data collection. Table 6 presents results from various specifications of the models in Eq. (1) and (2), using all observations over the 1800 to 2015 period. The models differ in terms of the control variables and fixed effects that we include, and rank from least restrictive with only country fixed effects in column (1) to most

restrictive with controls for economic development, inflation, all sorts of financial crises plus country and year fixed effects in column (4). We measure the *Financial Crisis* variable as a binary indicator marking the initial year of a bank crisis, stock market crash, currency crisis, inflation crisis, or sovereign debt crisis in a country as indicated in Reinhart and Rogoff [2011]. We include a single lag of the three-year backward-looking moving average *Financial Crisis* indicator as a control in the model. *Inflation* and *GDP per Capita* are defined as above. We estimate the models with logit regression and assess the statistical significance based on robust standard errors clustered by country.

Panel A reports results for all corporate scandals and regulations (suffix *_tot*). We gain the following insights. First, the evolution of corporate scandals and regulation over time follows an autoregressive process and is highly persistent. All the coefficients on the lagged terms of the dependent variable are positive and highly significant in both the *SCANDAL* and *REGULATION* model. This finding holds even after controlling for year fixed effects, which flexibly accounts for general (global) trends in the data. Second, using *REGULATION* as the dependent variable, lagged scandals help explain future regulatory action as the positive and significant coefficient on $SCANDAL_tot_{[t-1 \text{ to } t-3]}$ indicates. This result even holds in the most restrictive model of column (4), albeit only at the 10-percent level of statistical significance. Such a loss of power is not surprising because the year fixed effects likely subsume a portion of the treatment effect, particularly in times of globalization and international commerce and capital flows. Third, using *SCANDAL* as the dependent variable, lagged regulation possesses explanatory power for future corporate misconduct. The coefficient on $REGULATION_tot_{[t-1 \text{ to } t-3]}$ is significantly positive in all four specifications. In terms of the control variables, economic development is positively

related to both scandals and regulation in most models; inflation only helps explain regulation; controlling for financial crises in a country does not add to the explanatory power.[27]

The leading role of corporate scandals for regulation is consistent with the crisis theory. Regulators are less flexible and informed than firms and, consequently, are forced to take a reactive approach to regulation. The introduction of the 1933/34 U.S. Securities and Exchange Acts on the heels of the 1929 Stock Market Crash and the outbreak of the Great Depression, or the Sarbanes-Oxley Act in 2002 after the high-profile scandals at Enron, Dynegy, WorldCom, and the likes are prominent examples of such reactive behavior. However, on its own, the relation does not tell us whether regulation has been effective. It could represent the benevolent regulator trying to quickly fix the problem, the captured regulator hiding behind regulatory activism, or the ideological regulator imposing an imprint. Past regulation acting as an antecedent to future corporate scandals also allows multiple interpretations. This positive correlation suggests that regulators are not fully effective (in which case the relation should have been negative). Reasons for regulatory ineffectiveness are lack of proper enforcement (e.g., Christensen, Hail, and Leuz [2013, 2016]), or the flexibility of firms in directing their misbehavior to areas outside the narrow scope of the new regulation.[28] Another explanation for the positive relation is that only the existence of explicit rules lets the regulator identify corporate

[27] To explore a potential link between GDP and our two constructs of interest (see also figure 1), we run an (unplanned) analysis in which we regress future GDP on its lagged value, past scandals, past regulations, and inflation (i.e., a model similar in spirit to Equation 1, but with GDP as the primary variable). In this regression, neither past scandals nor regulations exhibit a significant association with future GDP.

[28] Lehman Brothers' use of so-called Repo 105 transactions in the quarters leading up to its bankruptcy in 2008 is an example of staying within the limits of U.S. GAAP, but nonetheless potentially misleading investors. The bank repeatedly engaged in short-term repurchase agreements and classified them as sales transactions. It then used the sales proceeds to pay down debt to convey the appearance of lower leverage to its investors. The auditor attested to Lehman that the transactions were in conformity with GAAP. The recent scandal involving the U.S. bank Wells Fargo is another example. The bank's employees fraudulently opened more than two million customer accounts, but management failed to report and auditors did not detect these irregularities even with strong regulations put in place under the 2010 Dodd-Frank Act. The bank argued that the transactions should not be considered "material events" for investors (see e.g., Wells Fargo scandal shows the value of regulation, *Star Tribune*, September 30, 2016).

actions as unlawful and in violation of public trust.[29] Finally, the positive correlation could indicate negative unintended consequences of regulatory action in that the new rules backfire and provoke unanticipated management behavior (Merton [1936]). Except for providing anecdotal evidence for their existence, unfortunately, our data does not allow us to disentangle the various explanations (and they may all be occurring simultaneously).

Panel B of table 6 reports the results for the same set of regressions while limiting the analyses to the pure accounting scandals and accounting regulations (*_acctg*). The results are very similar to panel A, albeit weaker in terms of statistical significance. Both accounting scandals and accounting regulation display a positive serial correlation. The leading role of scandals for future regulation is only present in the least restrictive model of column (1). The leading role of past regulatory activity for future scandals persists across all four models, but with lower *t*-statistics than in panel A.

Table 7 reports (unplanned) sensitivity analyses for various research design choices. We only tabulate the specification that corresponds to Model 2 in table 6, panel A, but the inferences extend to the other models as well. First, we output marginal effects of the independent variables while holding constant all the other covariates at the mean. This format allows us to interpret the coefficients as percentage changes in the underlying probability and to better gauge the economic magnitudes.[30] Based on column (1) in table 7, past corporate scandals increase the probability of future corporate scandals by 31 percent. At the same time, past regulatory action

[29] An example would be the enactment of the U.S. Foreign Corrupt Practices Act (FCPA) in 1977 after the SEC's investigation of questionable business practices that involved bribing foreign government officials, politicians, and political parties (e.g., Lockheed's bribery of the Japanese prime minister in 1976 or Chiquita Brand's bribery of the president of Honduras in 1974/75 were prominent cases). The FCPA reclassified what used to be "cost of doing business" as corporate fraud, and gave the SEC the necessary tools to successfully prosecute this behavior in future years. The SEC alone enforced 8 (more than 50) cases within 10 (20) years of the FCPA's adoption.

[30] Because our primary variables of interest *SCANDAL* and *REGULATION* are binary, the interpretation of the marginal effects is akin to switching the indicators from zero to one (note that we use 3-year moving averages in the regressions). That is, the percentage changes reflect changes from having no scandal or regulation to having at least one scandal or regulation in each of the past three years.

increases the probability of future scandals by 12 percent. In the regulation model, past scandals (regulatory actions) increase the likelihood of future regulation by 6 (13) percent. Second, an alternative way of interpreting the coefficients as approximate percentage changes is to estimate the models with OLS using the log transformed count (plus one) of scandals and regulations in a year as dependent and independent variables. In this model, country-years with many incidents receive more weight. As column (2) shows, a one percentage change in the number of scandals is related to a 0.46 percentage change in future scandals and a 0.08 percentage change in future regulatory action. The same numbers for a one percentage change in past regulations are 0.15 and 0.21 percentage changes in the number of future scandals and regulations, respectively. These estimates are very similar to the marginal effects from the logit regressions. Third, imposing country fixed effects might subsume some of the variation in the outcome variables and be too demanding for the nature of our data. Thus, we replace the country fixed effects with fixed effects for a country's legal tradition (and also cluster the standard errors by the same unit). We distinguish between English common law, French commercial code, German commercial code, and Scandinavian civil law countries (La Porta et al. [1998]). Not surprisingly, the magnitudes and the statistical significance of the coefficients increase with the less rigid fixed effects structure compared to our original specification (see column 3 of table 7). However, the inferences remain largely unchanged. Finally, we lag the past scandals and past regulation variables by an additional year (i.e., two years instead of one). This specification helps us assess the one-year lag structure that we have chosen for our main model (in line with Reinhart and Rogoff [2011]). As column (4) shows, the magnitude of the coefficients and the levels of statistical significance are only slightly attenuated. We obtain similar and sometimes even stronger results when we lag the leading variables by three years (not tabulated). This pattern is

consistent with a legislative process that often stretches over multiple years before the new regulation is implemented (e.g., Christensen, Hail, and Leuz [2016]).

In sum, we do find evidence of robust lead-lag relations between corporate scandals and regulation in our full sample, and they behave—at least in part—as the public interest view, theory of self-interest, or ideological view of regulation would predict. The observed relations are in line with the analyses of media mentions in section 4.1, but stronger, consistent with less measurement error when focusing on actual episodes of scandals and regulations. We next turn to analyzing whether the lead-lag relations differ in the cross-section and over time.

5. Additional Analyses

5.1. VARIOUS SUB-PERIODS OVER THE YEARS 1800 TO 2015

So far, we have documented the general lead-lag structure for the entire 215-year panel of historical data. However, the relations presumably do not remain stable over such a long period, particularly in light of the stark increase in corporate scandals after the 1970s (see figure 2). Thus, we re-estimate the models in Eq. (1) and (2) over various sub-periods, namely the years up to and including World War II (1800-1945), the entire post-World War II period (1946-2015), and the most recent years comprising the majority of scandals and regulations (1970-2015). We present results for these sub-periods together with the overall sample results as benchmarks in table 8. The table only reports the coefficient estimates for the main variables of interest, but the models include controls for economic development, inflation, and country fixed effects (i.e., column 2 in table 6). Panel A reports results for all scandals and regulation (*_tot*), panel B the same for accounting scandals and regulation (*_acctg*).

In panel A, the strong serial correlation in *SCANDAL* and *REGULATION* is present before and after 1945. The lagged moving averages of the dependent variables are positive and significant over both sample halves. We only find evidence of corporate scandals leading regulation in the years after World War II. In the period before, the coefficient is smaller in magnitude and insignificant. One explanation for the weaker results in earlier years might be the reduced public pressure on politicians and regulators during this period when democratically elected governments were rare and laws often were introduced as a result of military conflict (e.g., the French Commercial Code during the Napoleonic wars) or colonialism (e.g., the British imposing U.K.-style laws in colonial India, Canada, and Australia). Other potential explanations might be that there was less media coverage of corporate scandals during this period, and/or that the less extensive search capabilities available for historic news outlets led to our identification of fewer events in the data collection process. The leading role of past regulation for future scandals is present both before and after 1945.

The results for the most recent 46-year period stand out in that none of the *SCANDAL* and *REGULATION* coefficients are significant. It is during this period that stock markets have regained their importance and reached new heights (Rajan and Zingales [2003]). One issue with the later years is that scandals and regulation have become so commonplace that their frequency in some countries potentially reduces the power of the tests. For instance, during this period we only observe 8 years without scandal in Japan, and 6 in the U.K., substantially diminishing how the two countries can contribute to the identification of the coefficients. The insignificant results are also consistent with regulators becoming more timely in their reaction to events, even though we find no signs of increased regulatory effectiveness in recent years, in that future scandals do not go down after new regulations.

The results for accounting scandals and regulation in panel B are similar, but generally weaker. The serial correlation of scandals and regulation persists, but the only significant coefficient is the leading role of regulation regarding future scandals before 1945. After 1945, the predictive ability of accounting regulation for future scandals disappears. The coefficient on accounting scandals leading future regulatory action is never significant.

5.2. VARIOUS COUNTRY SUB-SAMPLES

We next compare the lead-lag structure of corporate scandals and regulation across various groups of countries. We use fundamental country attributes like economic development, rule of law, or legal tradition to form the partitions as these characteristics are likely to evolve only slowly over time. Specifically, we split the sample countries into developed versus emerging markets based on the classification in the Morgan Stanley Capital International database as of 2000. We distinguish between countries with strong and weak rule of law based on the index scores from La Porta et al. [1998] and split by the sample median. Finally, we run the regressions separately for English common law, French commercial code, German commercial code, and Scandinavian civil law countries (source: La Porta et al. [1998]). We report coefficients for the main variables of interest from estimating our base specification (i.e., column 2 in table 6) in table 9.

The serial correlation in corporate scandals is much more pronounced in emerging markets than in developed markets, consistent with fraudulent behavior being more of a problem in these economies. On the other hand, the serial correlation in regulation is only present in developed markets (but not in emerging markets). This finding suggests that ongoing regulatory activity is, among other things, a function of economic development, consistent with the graphical evidence in figure 1. Past scandals help explain future regulation in emerging markets, but not in

developed economies. The coefficient on the lagged moving average of *SCANDAL* is more than twice the magnitude, and significant only in the emerging market subset when explaining regulation. The result points to a more reactive approach by regulators in these countries relative to developed markets (maybe because less information is available or these countries cannot afford ongoing regulatory action). Regulation being an antecedent to future scandals is present in both sets of countries. Thus, regardless of the market structure, regulatory activity does not curb corporate misconduct, but rather increases the incidence of future scandals (be it because managers are able to avoid the new regulations, regulators have been given the means to detect and prosecute scandals, or the regulations spark crises which reveal new scandals). Countries with strong rule of law display lead-lag relations very similar to developed markets (or, alternatively, weak rule of law countries behave similarly to emerging markets), which is not surprising given that the two country attributes are highly correlated.[31]

When it comes to a country's legal tradition, all four groups display a positive serial correlation in scandals, while regulation is positively serially correlated in French and German commercial code countries. The leading role of scandals for regulation is present throughout except for countries with French legal tradition. This evidence could indicate more regulatory capture or a less reactive regulatory approach in French commercial code countries. The coefficient on the leading role of regulation for future scandals is similar in magnitude across the four groups, but not significant in Scandinavian civil law countries. This latter finding might be due to lower power, as we only have 444 observations from Scandinavian nations. In sum, we find systematic differences across groups of countries, suggesting that the effectiveness of regulation is shaped by fundamental characteristics like market development and legal tradition.

[31] The developed markets of Italy, Portugal, Spain, and the U.K. fall into the group of countries with relatively weaker rule of law, while the emerging markets China and Poland do not have an index value for rule of law.

5.3. INDIVIDUAL COUNTRIES

In this section, we report results from estimating the lead-lag relation on a country-by-country basis. Due to the small number of observations, we estimate a reduced form of the models in Eq. (1) and (2) that only includes the lagged moving averages of the two dependent variables plus an intercept (i.e., no additional control variables and fixed effects). Table 10 presents the coefficient estimates of these two variables together with the *z*-statistics (in parentheses). In the scandal regression (left-hand side of the table), we report the countries rank ordered by the magnitude of the lagged *REGULATION* coefficient. In the regulation model (right-hand side of the table), we report the countries rank ordered by the magnitude of the lagged *SCANDAL* coefficient. We assess the statistical significance based on robust standard errors (and also indicate whether the coefficients remain significant after including *GDP per Capita* and *Inflation* as control variables in the regressions).

When using *SCANDAL* as the dependent variable, corporate scandals are serially correlated in 21 out of 26 cases. That is, corporate misconduct is highly persistent throughout the world. More to the point, regulation is positively correlated with future scandals in 15 of the sample countries. The relation is most pronounced in Spain, Israel, Denmark, and Austria. The evidence suggests that regulators are not fully effective in these countries. There is only a single country, Finland, where the relation is negative (i.e., consistent with regulation reducing corporate misconduct under the public interest view), but the coefficient is insignificant.

In the *REGULATION* model, a country's regulatory activity is positively serially correlated in only 12 out of 26 cases. In some instances, the coefficient is negative, but never significant. Interestingly, whenever past regulatory activity has predictive power for future regulation, corporate scandals typically do not, and vice versa. The coefficient on the lagged moving

average of scandals is positive and significant in 14 countries, most notably in Israel, Greece, South Korea, and India. This finding suggests that in countries where regulatory activity can be primarily described as reactive (under the "crisis theory"), a consistent regulatory approach that persistently evolves over time is lacking.

5.4. SPILLOVER EFFECTS ACROSS COUNTRIES

In the final set of analyses (unplanned), we test for potential spillover effects across countries. It is quite plausible that the regulatory activity in one country might affect legislation in other countries, be it through military conflict (e.g., during the Napoleonic Wars or after World War I and II), by means of colonialization (e.g., across the dominions, colonies, and territories of the British Empire that comprised several of the sample countries), or through economic ties, bilateral trade, and foreign capital investments.[32] Similarly, corporate misconduct might spread around the globe. To allow for such cross-country associations between our constructs of interest, we expand the base specification (i.e., column 2 in table 6) by adding the lagged moving averages of corporate scandals and regulation from another sample country to the model. In this way, the time series of current domestic scandals and regulations are modeled as a function of both past domestic and foreign scandals and regulations plus controls. We exclude the respective foreign country from the sample in this analysis.

Table 11 reports the results for two foreign countries with a potential impact on domestic regulatory activity and corporate misconduct, namely the United Kingdom and France. We chose

[32] Examples of cross-country spillovers are: the development of Australian financial reporting, which in its early years was marked by the influence of British company law like the U.K. *Joint Stock Companies Act* of 1844 or the *Companies Act* of 1862; the wide-ranging historical impact of the French *Commercial Code's* bookkeeping provisions in Europe; or the internal control portions of Japan's *Financial Instruments and Exchange Act* of 2006 (commonly referred to as J-SOX in line with the 2002 *Sarbanes-Oxley Act,* SOX, in the U.S.), which were enacted in response to Enron-like corporate scandals in Japan (e.g. Kanebo, Livedoor, and Murakami Fund). Equivalent or similar legislation to SOX was also introduced in Canada, Germany, France, Australia, Italy, etc.

these two countries because they have had long colonial histories and are at the core of the English common law and French commercial code legal traditions. The first two columns report the results for spillover effects from the United Kingdom. We note that the relations between past and future *domestic* scandals and regulations remain intact and are all significant at the 5-percent level or better. However, the coefficient estimates and *z*-statistics are slightly lower in magnitude than in table 6, consistent with the mitigating effects from foreign legislation and scandals. More to the point, the influence of the British regime on other sample countries comes through in the significantly positive coefficients on the lagged U.K. scandal variable in the *SCANDAL* model and the lagged U.K. regulation term in the *REGULATION* model. The results suggest that regulatory activity (corporate misconduct) in one country has the potential to act as an antecedent to future regulations (corporate scandals) in other countries, and that the serial correlation in our constructs is not limited to within-country variation, but likely reflects some broader, global underlying forces (unless the British multinationals transmitted their domestic scandals to the colonies). The coefficients on the foreign variables are about three times smaller than the coefficients on the domestic variables. Interestingly, past U.K. regulations also possess explanatory power for future corporate scandals in other countries, as indicated by the significantly positive coefficient on $Foreign_REGULATION_tot_{[t-1 \text{ to } t-3]}$ in column (1). Past U.K. scandals are not related to future domestic regulatory activity.

The results for France as a source of cross-country spillover effects are reported in columns (3) and (4). They look very similar to the U.K. results. The domestic relations between scandals and regulations remain intact while, at the same time, past French scandals and regulations have predictive power for future corporate misconduct and regulatory activity in other countries, respectively. The coefficient on $Foreign_SCANDAL_tot_{[t-1 \text{ to } t-3]}$ in column (4) is positive and

significant at the 10-percent level, indicating that the time-series of scandals in France is related to future regulatory activity in other countries. Past French regulation is not associated with future domestic scandals. In sum, we do find initial evidence of cross-country spillover effects in our data, but a more comprehensive analysis of these interrelations is needed.

6. Conclusion

Can regulators proactively pre-empt corporate wrongdoing before it occurs? And do they detect and rectify actual misbehavior in a timely and persistent manner? To answer these questions, we develop an extensive historical time series of corporate scandals and regulations for 26 countries over the period 1800 to 2015. Our analyses of the lead-lag structure for the large panel (at both the global and individual country level) reveal several stylized facts. Both regulation and corporate scandals are highly persistent. Regulatory activity has a strong reactive component to scandals that have attracted media attention. Regulations do not curb corporate misconduct. In fact, today's regulations predict an increase (rather than decrease) in future corporate scandals. Finally, the lead-lag structure between scandals and regulation is changing over time and is affected by local institutional factors like market development and a country's legal tradition. Overall, our results cast doubt on the effectiveness of regulation from a public interest view.

The question then becomes why regulation exists in the first place (e.g., McCraw [1984]). This issue is even more pressing given the substantial (monetary) resources countries dedicate to the promulgation, implementation, and enforcement of regulations. Of course, ideology can always serve to justify regulation. Similarly, self-interest and regulatory capture provide strong incentives for select parties to design and implement regulations in specific ways. Our study focuses on a single benefit of regulation (i.e., the curbing and prevention of corporate

misconduct). However, other costs and benefits may exist. For instance, regulation might enhance minority investors' participation in the stock market and, in turn, render capital allocation more efficient. One insight from our findings is that there are winners and losers of regulation. For instance, the strong positive correlation between past regulation and future scandals suggests that regulatory activity does not always achieve its goal, but leads to unwanted outcomes. This evidence could be yet another example of what Hayek [1989] called the pretense of knowledge in that regulators do not and cannot fully understand the inner workings of a complex system, but treat it as if it were following the mechanistic laws of physics.

Our panel analysis of more than 200 years of rich historical data gives rise to several follow-up questions. For instance, what are the factors driving the change in the interrelation between scandals and regulation over time and across countries, as our empirical evidence suggests? How does transitioning from a non-democratic to a democratic regime or vice versa affect this change? How do regulations and corporate scandals spread over time and across nations? In countries where we show that regulators behave reactively, what types of scandals prompt them to implement and enforce new regulation, and how long does it take? In countries where we show evidence of a leading role of regulation, disentangling the explanations for the future occurrence of scandals is crucial. Are these scandals a direct violation of existing regulations or are firm managers able to creatively circumvent the new rules? Our dataset offers ample opportunity for inquiry. Moreover, future researchers can refine the existing data collection, add more countries and/or time periods, and complement the scandal and regulation data with other relevant variables, similar in spirit to the Standard Cross-Cultural Sample from Murdock and White [1969] (see also Basu, Kirk, and Waymire [2009] for an application in accounting). We leave issues like these for future research.

REFERENCES

ALESINA, A. "Credibility and Policy Convergence in a Two-party System with Rational Voters." *American Economic Review* 78 (1988): 796–805.

ARNOLD, A., AND S. MCCARTNEY. "'It May Be Earlier Than You Think': Evidence, Myths and Informed Debate in Accounting History." *Critical Perspectives on Accounting* 14 (2003): 227–53.

BENSTON, G. "Required Disclosure and the Stock Market: An Evaluation of the Securities Exchange Act of 1934." *American Economic Review* 63 (1973): 132–55.

BALL, R. "Market and Political/regulatory Perspectives on the Recent Accounting Scandals." *Journal of Accounting Research* 47 (2009): 277–323.

BALSAM, S.; I. HAW; AND S. LILIEN. "Mandated Accounting Changes and Managerial Discretion." *Journal of Accounting and Economics* 20 (1995): 3–29.

BASU, S.; M. KIRK; AND G. WAYMIRE. "Memory, Transaction Records, and The Wealth of Nations." *Accounting, Organizations and Society* 34 (2009): 895–917.

BERNSTEIN, R. *Elections, Representation, and Congressional Voting Behavior: The Myth of Constituency Control*. Upper Saddle River NJ: Prentice-Hall, 1989.

BUSHEE, B., AND C. LEUZ. "Economic Consequences of SEC Disclosure Regulation: Evidence from the OTC Bulletin Board." *Journal of Accounting and Economics* 39 (2005): 233–64.

CALLANDER, S. "Political Motivations." *Review of Economic Studies* 75 (2008): 671–97.

CARPENTER, D., AND D. MOSS. *Preventing Regulatory Capture: Special Interest Influence and How to Limit It*. Cambridge. U.K.: Cambridge University Press, 2014.

CHRISTENSEN, H.; L. HAIL; AND C. LEUZ. "Mandatory IFRS Reporting and Changes in Enforcement." *Journal of Accounting and Economics* 56 (2013): 147–77.

CHRISTENSEN, H.; L. HAIL; AND C. LEUZ. "Capital-market Effects of Securities Regulation: Prior Conditions, Implementation, and Enforcement." *Review of Financial Studies* 29 (2016): 2885–924.

DEAN, G., AND F. CLARKE. Chapter 1: Australia. In: Previts, G.; P. Walton; and P. Wolnizer (eds.). *A Global History of Accounting, Financial Reporting and Public Policy: Asia and Oceania*. Emerald Group Publishing: Bingley, U.K. (2011): 1–34.

DIERMEIER, D.; M. KEANE; AND A. MERLO. "A Political Economy Model of Congressional Careers." *American Economic Review* 95 (2005): 347–73.

DYCK, A.; A. MORSE; AND L. ZINGALES. "Who Blows the Whistle on Corporate Fraud?" *The Journal of Finance* 65 (2010): 2213–53.

DYCK, A.; A. MORSE; AND L. ZINGALES. "How Pervasive is Corporate Fraud?" Working paper, University of Toronto, University of California at Berkeley, and University of Chicago, 2014.

DYE, R.; J. GLOVER; AND S. SUNDER. "Financial Engineering and the Arms Race Between Accounting Standard Setters and Preparers." *Accounting Horizons* 29 (2015): 265–95.

ENGSTROM, D. "Corralling Capture." *Harvard Journal of Law and Public Policy* 36 (2013): 31–9.

FRANKS, J.; C. MAYER; AND S. ROSSI. "Ownership: Evolution and Regulation." *Review of Financial Studies* 22 (2009): 4009–56.

FRYE, T., AND A. SHLEIFER. "The Invisible Hand and the Grabbing Hand." *American Economic Review* 87 (1997): 354–8.

GAO, F.; J. WU; AND J. ZIMMERMAN. "Unintended Consequences of Granting Small Firms Exemptions from Securities Regulation: Evidence from the Sarbanes-Oxley Act." *Journal of Accounting Research* 47 (2009): 459–506.

GIANNETTI, M., AND T. WANG. "Corporate Scandals and Household Stock Market Participation." *Journal of Finance* 71 (2016): 2591–2636.

GOETZMANN, W.; C. LABIO; K. ROUWENHORST; AND T. YOUNG. *The Great Mirror of Folly: Finance, Culture, and the Crash of 1720*. New Haven: Yale University Press, 2013.

GRANGER, C. "Investigating Causal Relations by Econometric Models and Cross-spectral Methods." *Econometrica* 37 (1969): 424–38.

HAYEK, F. "The Pretence of Knowledge." *American Economic Review* 79 (1989): 3–7.

HARRIS, R. "The Bubble Act: Its Passage and Its Effects on Business Organization." *Journal of Economic History* 54 (1994): 610–27.

HOFFMANN, S., AND D. DETZEN. "The Regulation of Asset Valuation in Germany." *Accounting History* 18 (2013): 367–89.

HUNG, M.; T.J. WONG; AND F. ZHANG. "The Value of Political Ties Versus Market Credibility: Evidence from Corporate Scandals in China." *Contemporary Accounting Research* 32 (2015): 1641–75.

INTERNATIONAL PRACTICE EXECUTIVE COMMITTEE. *Professional Accounting in 30 Countries.* New York: American Institute of Certified Public Accountants, 1975.

JONES, M. *Creative Accounting, Fraud and International Accounting Scandals*. West Sussex, U.K.: John Wiley & Sons, 2011.

KALT, J., AND M. ZUPAN. "Capture and Ideology in the Economic Theory of Politics." *American Economic Review* 74 (1984): 279–300.

KARPOFF, J.; A. KOESTER; D. LEE; AND G. MARTIN. "Proxies and Databases in Financial Misconduct Research." *The Accounting Review* (2017): forthcoming.

KARPOFF, J.; D. LEE; AND G. MARTIN. "The Cost to Firms of Cooking the Books." *Journal of Financial and Quantitative Analysis* 43 (2008): 581–612.

KAU, J., AND P. RUBIN. "Self-interest, Ideology, and Logrolling in Congressional Voting." *Journal of Law and Economics* 22 (1979): 365–84.

KAU, J., AND P. RUBIN. "Ideology, Voting, and Shirking." *Public Choice* 76 (1993): 151–72.

KRUEGER, A. "The Political Economy of the Rent-seeking Society." *American Economic Review* 64 (1974): 291–303.

LA PORTA, R.; F. LOPEZ-DE-SILANES; AND A. SHLEIFER. "What Works in Securities Laws?" *The Journal of Finance* 61 (2006): 1–32.

LA PORTA, R.; F. LOPEZ-DE-SILANES; A. SHLEIFER; AND R. VISHNY. "Legal Determinants of External Finance." *The Journal of Finance* 52 (1997): 1131–50.

LA PORTA, R.; F. LOPEZ-DE-SILANES; A. SHLEIFER; AND R. VISHNY. "Law and Finance." *Journal of Political Economy* 106 (1998): 1113–55.

LEE, D.; E. MORETTI; AND M. BUTLER. "Do Voters Affect or Elect Policies? Evidence from the U.S. House." *Quarterly Journal of Economics* 119 (2004): 807–59.

LEUZ, C.; A. TRIANTIS; AND T. WANG. "Why Do Firms Go Dark? Causes and Economic Consequences of Voluntary SEC Deregistrations." *Journal of Accounting and Economics* 45 (2008): 181–208.

LEUZ, C., AND P. WYSOCKI. "The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research." *Journal of Accounting Research* 54 (2016): 525–622.

LITTLETON, A. *Accounting Evolution to 1900*. New York, NY: American Institute Publishing, 1933.

MAHONEY, P. "The Political Economy of the Securities Act of 1933." *Journal of Legal Studies* 30 (2001): 1–31.

MAHONEY, P. "The Origins of the Blue-Sky Laws: A Test of Competing Hypotheses." *Journal of Law and Economics* 46 (2003): 229–51.

MARKOPOLOS, H. *No One Would Listen: A True Financial Thriller*. Hoboken, NJ: John Wiley & Sons, 2010.

MCCRAW, T. *Prophets of Regulation*. Cambridge, MA: Harvard University Press, 1984.

MERTON, R. "The Unanticipated Consequences of Purposive Social Action." *American Sociological Review* 1 (1936): 894–904.

MIAN, A.; A. SUFI; AND F. TREBBI. "The Political Economy of the U.S. Mortgage Default Crisis." *American Economic Review* 100 (2010): 1967–98.

MILLER, G. "The Press as a Watchdog for Accounting Fraud." *Journal of Accounting Research* 44 (2006): 1001–33.

MURDOCK, G., AND D. WHITE. "Standard Cross-Cultural Sample." *Ethnology* 8 (1969): 329–69.

NOBES, C. "Cycles in UK Standard Setting." *Accounting and Business Research* 21 (1991): 265–74.

O'CONNOR, S. "Be Careful What You Wish for: How Accountants and Congress Created the Problem of Auditor Independence." *Boston College Law Review* 45 (2004): 741–827.

PARTNOY, F. "The Siskel and Ebert of Financial Markets: Two Thumbs Down for the Credit Rating Agencies." *Washington University Law Review* 77 (1999): 619–714.

PELTZMAN, S. "Toward a More General Theory of Regulation." *Journal of Law and Economics* 19 (1976): 211–40.

PIGOU, A. *The Economics of Welfare*. London, U.K.: Macmillan, 1938.

POOLE, K., AND H. ROSENTHAL. "Are Legislators Ideologues or the Agents of Constituents?" *European Economic Review* 40 (1996): 707–17.

POOLE, K., AND H. ROSENTHAL. *Congress: A Political-Economic History of Roll Call Voting*. New York, NY: Oxford University Press, 1997.

PREVITS, G., AND B. MERINO. *A History of Accountancy in the United States: The Cultural Significance of Accounting*. Columbus, OH: Ohio State University Press, 1998.

PREVITS, G.; P. WALTON; AND P. WOLNIZER. *A Global History of Accounting, Financial Reporting and Public Policy: Europe*. Bingley, U.K.: Emerald Group Publishing Limited, 2010.

RAJAN, R., AND L. ZINGALES. "The Great Reversals: The Politics of Financial Development in the Twentieth Century." *Journal of Financial Economics* 69 (2003): 5–50.

REINHART, C., AND K. ROGOFF. *This Time is Different*. Princeton, NJ: Princeton University Press, 2009.

REINHART, C., AND K. ROGOFF. "From Financial Crash to Debt Crisis." *American Economic Review* 101 (2011): 1676–1706.

RICHARD, J. "The Concept of Fair Value in French and German Accounting Regulations from 1673 to 1914 and its Consequences for the Interpretation of the Stages of Development of Capitalist Accounting." *Critical Perspectives on Accounting* 16 (2005): 825–50.

SHLEIFER, A. "Understanding Regulation." *European Financial Management* 11 (2005): 439–51.

STIGLER, G. "The Theory of Economic Regulation." *The Bell Journal of Economics and Management Science* 2 (1971): 3–21.

SUNDER, S. "Minding Our Manners: Accounting as Social Norms." *The British Accounting Review* 37 (2005): 367–87.

SUNDER, S. "Rethinking Financial Reporting: Standards, Norms and Institutions." *Foundations and Trends in Accounting* 11 (2016): 1–118.

TAHOUN, A., AND L. VAN LENT. "The Personal Wealth Interests of Politicians and Government Intervention in the Economy." Working paper, London Business School and Tilburg University, 2013.

TAMNY, J. *Popular Economics*. Washington DC: Regnery Publishing, 2015.

VAN OVERFELT, W.; M. DELOOF; AND A. VANSTRAELEN. "Determinants of Corporate Financial Disclosure in an Unregulated Environment: Evidence from the Early 20th Century." *European Accounting Review* 19 (2010): 7–34.

WAYMIRE, G., AND S. BASU. "Accounting is an Evolved Economic Institution." *Foundations and Trends in Accounting* 2 (2007): 1–174.

WAYMIRE, G., AND S. BASU. "Economic Crisis and Accounting Evolution." *Accounting and Business Research* 41 (2011): 207–32.

WEI, Y. *Securities Markets and Corporate Governance: A Chinese Experience.* Surrey, U.K.: Ashgate Publishing, 2009.

WITMAN, D. "Candidates with Policy Preferences: A Dynamic Model." *Journal of Economic Theory* 14 (1977): 180–9.

YANDLE, B. "Bootleggers and Baptists: The Education of a Regulatory Economist." *Regulation* 7 (1983): 12–6.

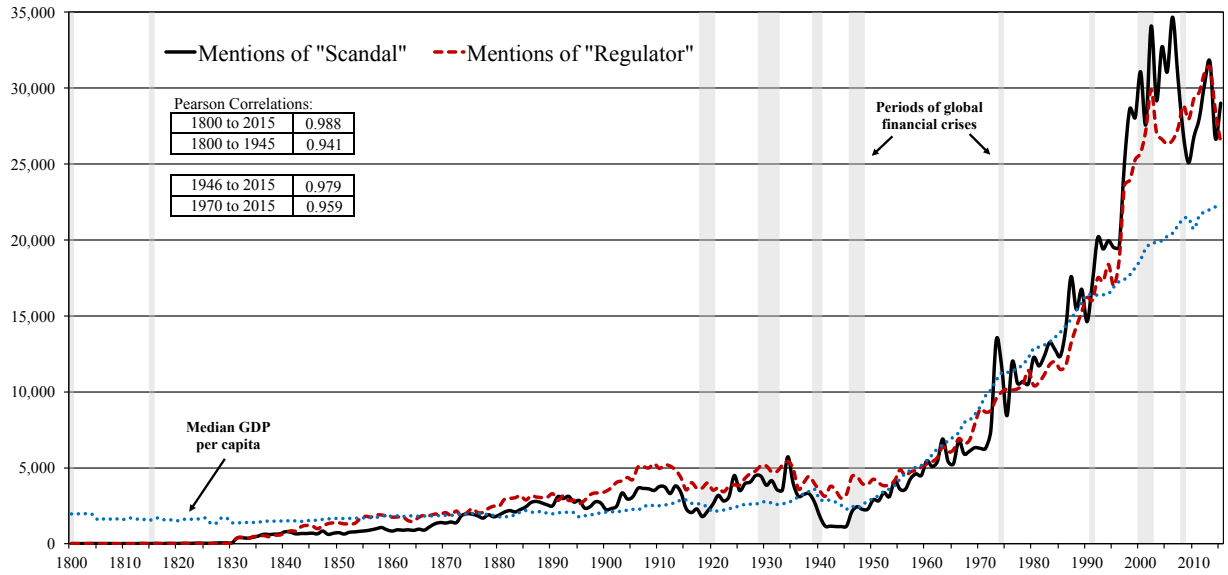
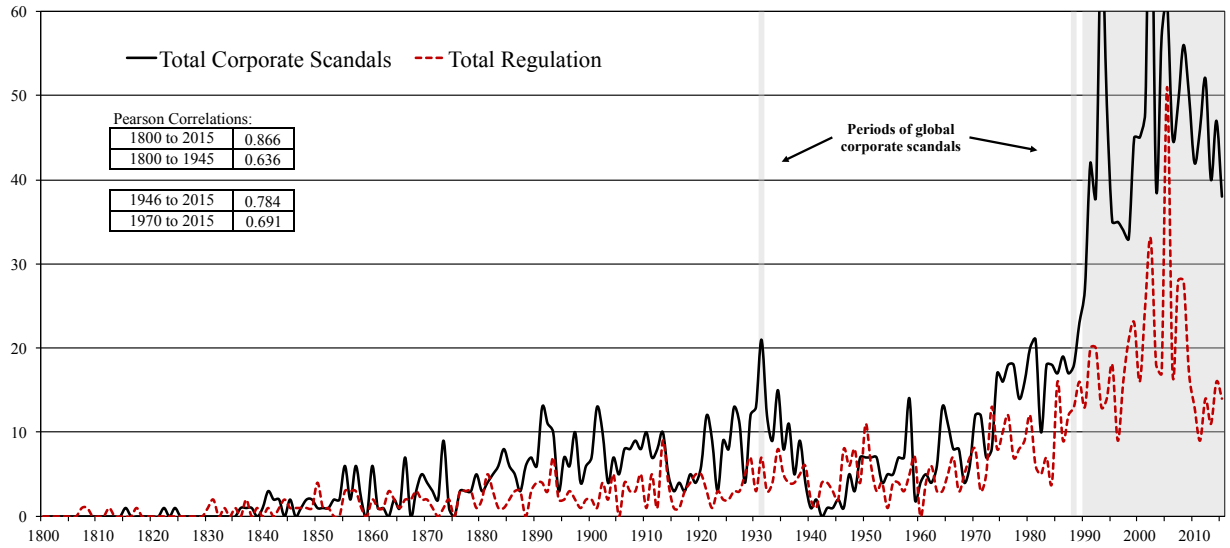


FIG. 1.—The figure plots the yearly number of times the terms "scandal" and "regulator" are mentioned in the local business press over the 1800 to 2015 period. The sample comprises 24 (out of 26) countries, for which we have electronically accessible and searchable newspaper archives available. We have no data for Portugal and Egypt. In each country, we search the historical archives of a leading (business) newspaper for the occurrence of the above two terms (or the local equivalents), and aggregate these numbers on a yearly basis (see the appendix for details and individual country graphs). We report the contemporaneous Pearson correlation coefficients between the two time-series over the entire period as well as over various sub-periods. The graph also plots the median GDP per capita of the sample countries over time (dotted line; measured in 1990 International Dollars; source: The Maddison-Project, 2013 version). We further indicate periods of global financial crises (shaded in grey), and defined as years in which more than two-thirds of the sample countries experienced at least one crisis of the following type: bank crisis, stock market crash, currency crisis, inflation crisis, or sovereign debt crisis. The financial crises definitions and data are from Reinhart and Rogoff [2011].

Panel A: Number of total corporate scandals and total regulation



Panel B: Number of accounting scandals and accounting regulation

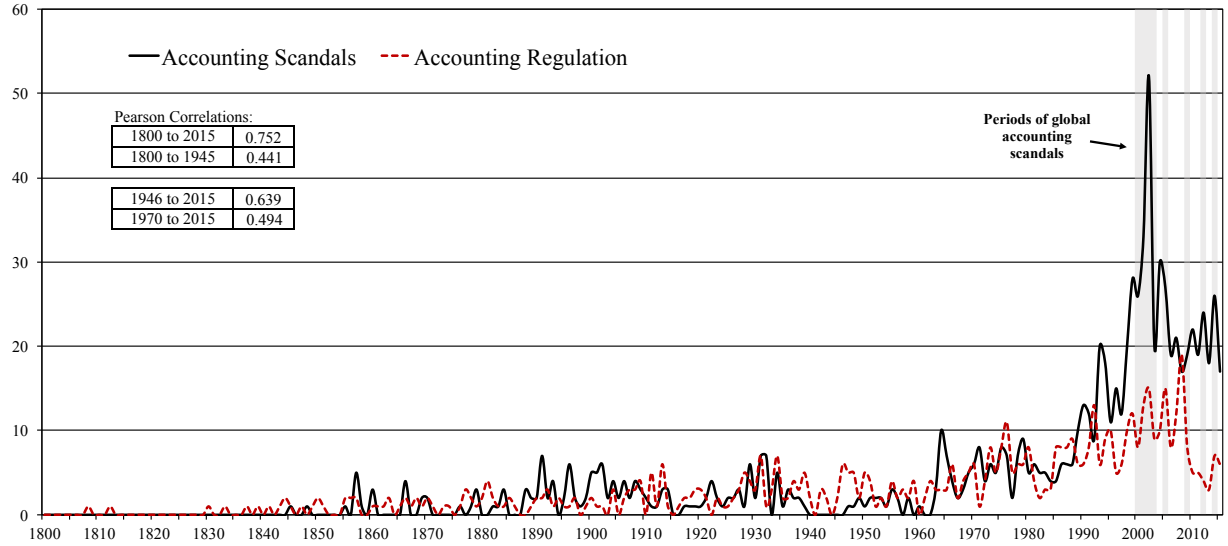


FIG. 2.—The figure plots the yearly number of total corporate scandals and total regulation (panel A) or accounting scandals and accounting regulation (panel B) for our sample of 26 countries over the 1800 to 2015 period. Total scandals comprise accounting scandals, near accounting scandals, and other scandals. Total regulations comprise accounting regulations, other regulations, and supranational regulations. See section 2 for details. If feasible, we measure corporate scandals in the year they are first covered in the financial press, and regulation in the year it is enacted. We report the contemporaneous Pearson correlation coefficients between the two time-series over the entire period as well as over various sub-periods. We further indicate periods of *global* corporate (accounting) scandals (shaded in grey), and defined as years in which more than half of the sample countries experienced at least one corporate (accounting) scandal.

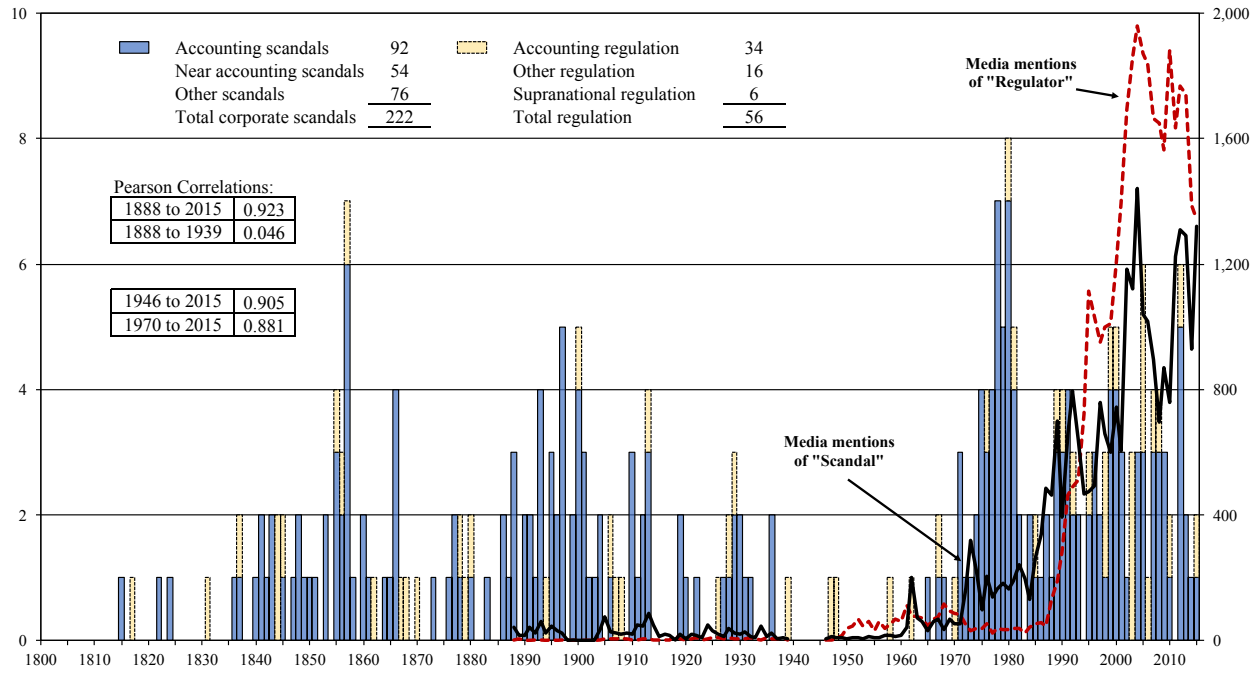


FIG. 3.—The figure plots the yearly number of total corporate scandals and regulation for the United Kingdom over the period 1800 to 2015 (shaded bars; axis on the left). The figure also plots the yearly number of times the terms "scandal" (solid line) and "regulator" (dashed line; axis on the right) are mentioned in the U.K. newspaper *Financial Times* (beginning in 1888). We exclude the period of World War II (1940 to 1945) from the analyses because the mentions of the two search terms in the media drop close to zero during these years. We report the contemporaneous Pearson correlation coefficients between the two time-series of media mentions over the entire period as well as over various sub-periods.

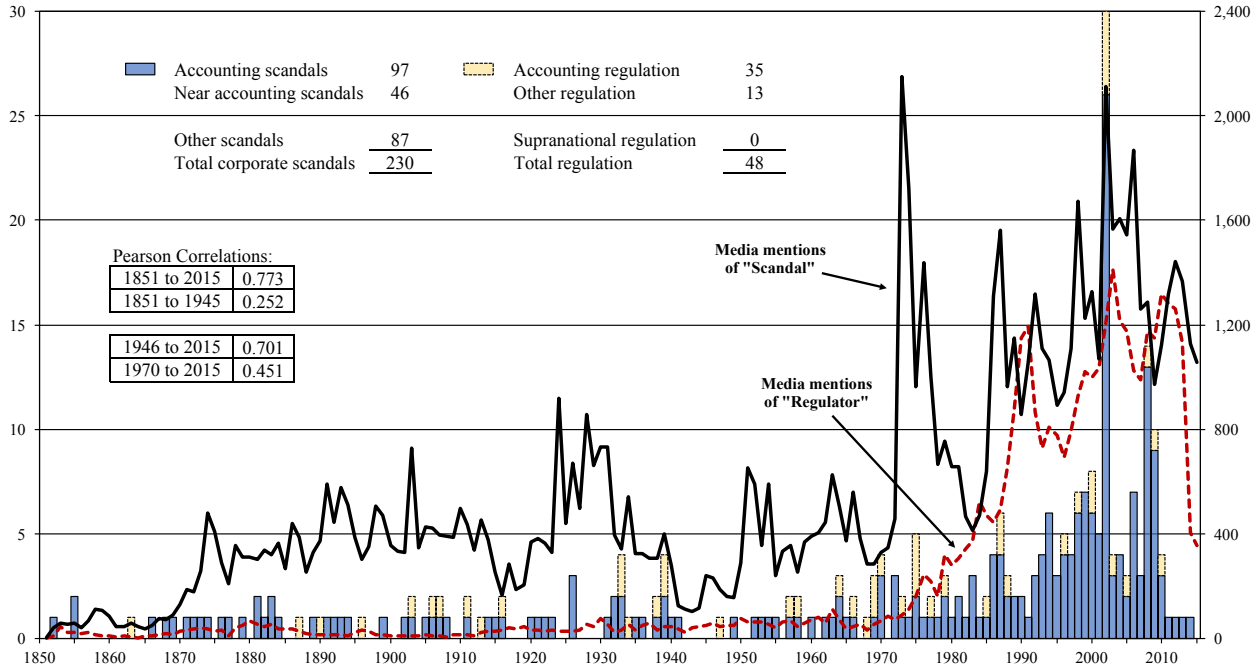


FIG. 4.—The figure plots the yearly number of total corporate scandals and regulation for the United States over the period 1851 to 2015 (shaded bars; axis on the left). The figure also plots the yearly number of times the terms "scandal" (solid line) and "regulator" (dashed line; axis on the right) are mentioned in the U.S. newspaper *The New York Times*. We report the contemporaneous Pearson correlation coefficients between the two time-series of media mentions over the entire period as well as over various sub-periods.

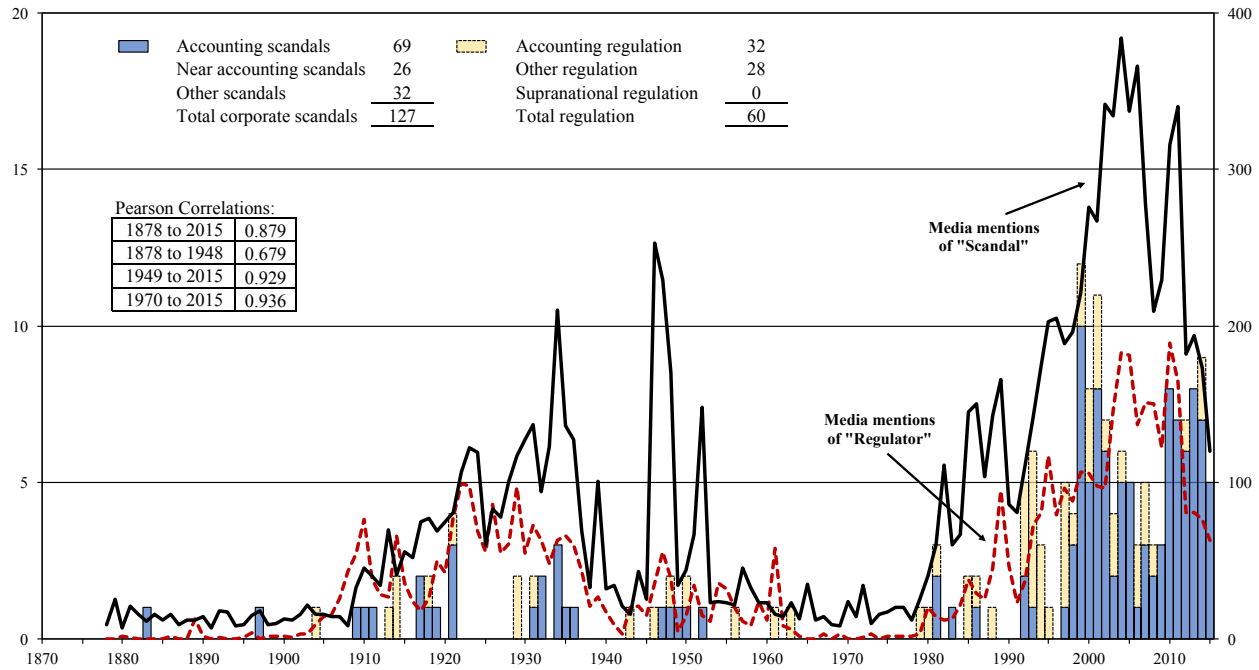


FIG. 5.—The figure plots the yearly number of total corporate scandals and regulation for China over the period 1878 to 2015 (shaded bars; axis on the left). The figure also plots the yearly number of times the terms "scandal" (solid line) and "regulator" (dashed line; axis on the right) are mentioned in the Chinese newspapers *Shen Bao* (i.e., Shanghai News; 1878 to1948) and *People's Daily* (1949 to 2015). We use the terms "scandal" ("醜聞" or "丑闻") and "fraud" ("弊案", "欺詐" or "欺诈", and "詐骗" or "诈骗") together with "supervising authority" ("监管會" or "监管机构", "監督會" or "监督机构", and "監察會" or "监察机构") and "company law" ("公司律", "公司條例" or "公司条例", and "公司法") in the media search. We report the contemporaneous Pearson correlation coefficients between the two time-series of media mentions over the entire period as well as over various sub-periods.

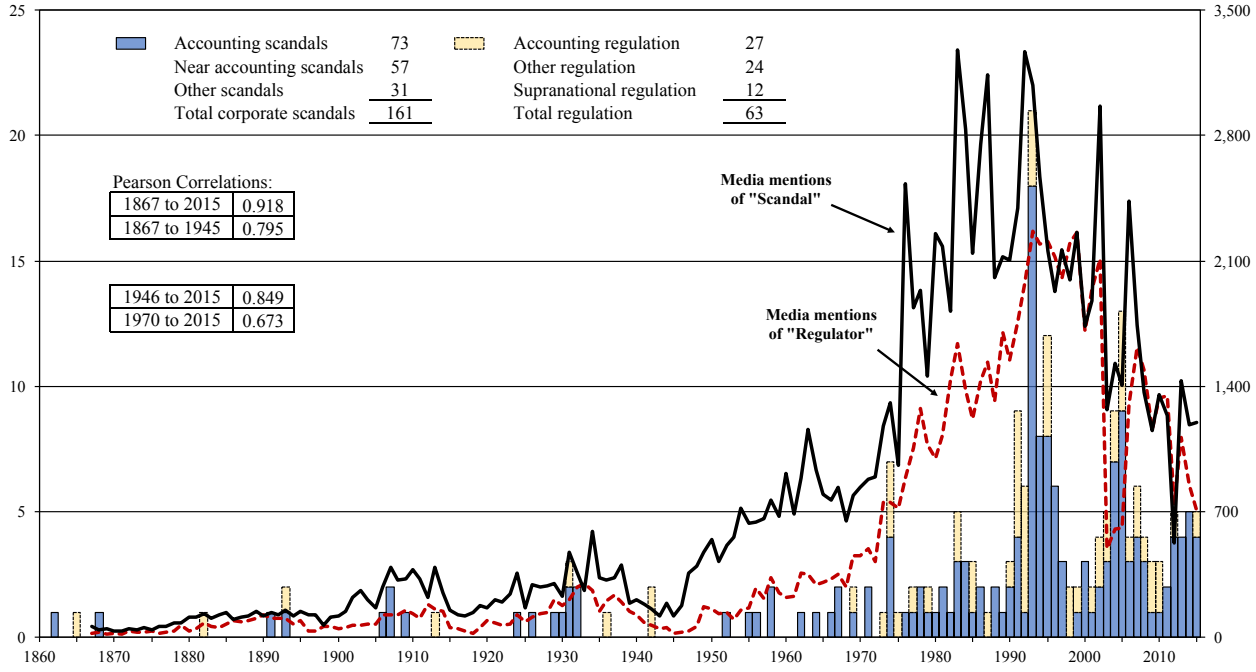


FIG. 6.—The figure plots the yearly number of total corporate scandals and regulation for Italy over the period 1860 to 2015 (shaded bars; axis on the left). The figure also plots the yearly number of times the terms "scandal" (solid line) and "regulator" (dashed line; axis on the right) are mentioned in the Italian newspaper *La Stampa* (beginning in 1867). We use the terms "scandal" ("scandalo") and "regulator" ("regolatore" and "legislatore") in the media search. We retain the years during World War II (1940 to 1945) for the analysis even though the search produces lower levels of newspaper hits, but the numbers remain comparable to adjacent years and far above zero. We report the contemporaneous Pearson correlation coefficients between the two time-series of media mentions over the entire period as well as over various sub-periods.

TABLE 1

Data Sources and Data Availability for Newspaper Search by Country

Country	Earliest Year	**Premier (Business) Outlets**/Other Outlets (Period Covered and Available Archives)
Australia	1831	- **Sydney Morning Herald** (until 1841: Sydney Herald; 1831 to 2015); online archive through Trove from the National Library of Australia (E); online newspaper archive ($; E); and online archive through Fairfax Media News Store (E). - Australian Financial Review* (1987 to 2015); online archive through Factiva ($; E).
Austria	1800	- **Wiener Zeitung*** (1800 to 1847; 1908 to 1913; 1919 to 1932); online archive through university library (E). - **Die Presse***/Neue Freie Presse (1848 to 1939; 2001 to 2015); online archive through university library (E), and online newspaper archive ($; E). - Austria Press Agency APA (1955 to 2015); online archive of provider ($; E).
Belgium	1831	- **L'Indépendance Belge** (1831 to 1940); digital archive with onsite access at Royal Belgian Library (E). - Het Laatste Nieuws (1941 to 1950); digital archive with onsite access at Royal Belgian Library (E). - Het Belang van Limburg (1951 to 1987); digital archive with onsite access at the editorial office of the newspaper (E). - **De Tijd*** (1988 to 2015); online newspaper archive ($; E).
Brazil	1875	- **O Estado de São Paulo** (1875 to 2015); online newspaper archive ($; E). - Folha de São Paulo (1921 to 2015); online newspaper archive (E). - **Valor Econômico*** (1996 to 2015); online newspaper archive ($; E).
Canada	1844	- **The Globe and Mail** (until 1936: The Globe; 1844 to 2015); online archive through ProQuest Historical Newspapers ($; E).
China	1878	- **Shen Bao** (申报, 1878 to 1949); online archive through university library (E). - **People's Daily** (人民日报, 1949 to 2015): online archive through university library (E) and Factiva ($; E). - 21st Century Business Herald* (21 世纪经济报道, 2001 to 2015); online archive through WiseSearch ($; E).
Denmark	1884	- **Politiken** (1884 to 2015); online newspaper archive ($; E). - **Dagbladet Børsen*** (1970 to 2015); online newspaper archive ($; E). - Berlingske Business* (1980 to 2015); online newspaper archive ($; E). - Finans.dk (1996 to 2015); online newspaper archive ($; E).
Egypt	1888	- **The Egyptian Gazette** (1888 to 1966); onsite access to newspaper microfilms at the Center for Research Libraries and various university libraries (M). - **La Bourse Égyptienne*** (1929-1963); onsite access to newspaper microfilms at the Center for Research Libraries (M). - Al Ahram Weekly (1998 to 2015); online newspaper archive (E). - Daily News Egypt (2008 to 2015); online archive through Lexis Nexis ($, E).
Finland	1889	- **Helsingin Sanomat*** (1889 to 2015); national library digital collections (E); onsite access to digital collection of the Päivälehti Archives (E); and online newspaper archive ($; E).
France	1826	- **Le Figaro** (1826 to 1942); online archive through French National Library (E). - Journal des Finances* (1870 to 1938); online archive through French National Library (E). - **Le Monde*** (1945 to 2015); online newspaper archive ($; E). - Les Échos* (1997 to 2015); online archive through Factiva ($; E).
Germany	1805	- Hamburger Börsen-Halle (1805 to 1866); online archive through university library (E). - Berliner Börsen-Zeitung (1872 to 1930); online archive through university library (E). - **Frankfurter Allgemeine Zeitung*** (1949 to 2015); online newspaper archive ($; E).
Greece	1830	- Empros (1896 to 1930; 1945 to 1966); online archive through university library (E). - Other newspaper sources used: Eleftheria (E; 1945 to 1966); Aion (M; 1838 to 1891); Acropolis (M; 1883 to 1935); To Asty (M; 1885 to 1907); various (M; 1830 to 1936); online access to newspaper microfilms through the library of the Greek Parliament. - **Naftemporiki*** (1996 to 2015); online newspaper archive (E, $).
India	1838	- **The Times of India** (1838 to 2015); online archive through ProQuest Historical Newspapers and NewsBank ($; E). - Financial Times* (1888 to 2015); online newspaper archive ($; E).
Israel	1932	- **The Jerusalem Post** (until 1950: The Palestine Post; 1932 to 2015); online archive through ProQuest Historical Newspapers and Lexis Nexis ($; E).
Italy	1860	- **La Stampa*** (1867 to 2015); online newspaper archive (E). - Il Corriere della Sera (1876 to 2015); online newspaper archive ($; E). - Il Sole 24 Ore (1920 to 2015); online newspaper archive ($; E).

(Continued)

TABLE 1—*Continued*

Country	Earliest Year	**Premier (Business) Outlets**/Other Outlets (Period Covered and Available Archives)
Japan	1874	- **Yomiuri Shimbun** (読売新聞; 1874 to 2015); online newspaper archive ($; E). - The Nikkei* (日本経済新聞; 1975 to 2015); online newspaper archive ($; E).
Korea (South)	1920	- **Cho-sun Il-Bo** (1920 to 2015); online archive through university library (E).
Netherlands	1828	- **Algemeen Handelsblad*** (from 1970 on: **NRC Handelsblad***) (1828 to 1994; 1998 to 2015); online archive through Delpher (E); and online archive through Lexis Nexis ($; E).
Poland	1920	- **Gazeta Wyborcza*** (1989 to 2015); online archive through university library (E). - Kurier Warszawski (1920 to 1938, missing 1921 and 1927); online archive through university library (M).
Portugal	1864	- **Diário de Notícias** (1864 to 1918; 1974 to 2015): onsite access to newspaper microfilms at National Library of Portugal (M); and online archive through Factiva ($; E). - Diário de Notícias, Portuguese-American edition (1919 to 1973); online archive through library (E).
South Africa	1880	- **The Rand Daily Mail** (1905 to 1910; 1940 to 1985); online archive through NewsBank ($; E). - Other newspaper sources used: The Journal (1880 to 1913); Natal Witness (1880 to 1885); Friend of the Free State and Bloemfontein Gazette (1880 to 1890); Indian Opinion (1903 to 1922); various (1880 to 1939); online archive through NewsBank ($, E). - **Business Day*** (1986 to 2015): onsite access to newspaper microfilms at Northwestern University (M); and online archive through NewsBank ($; E).
Spain	1881	- **La Vanguardia** (1881 to 2015); online newspaper archive ($; E). - **Cinco Días*** (1978 to 2015); online newspaper archive ($; E).
Sweden	1831	- **Svenska Dagbladet** (1884 to 2015); online archive through national library of Sweden (E). - Aftonbladet (1831 to 2015); online archive through national library of Sweden (E). - **Dagens Industri*** (1976 to 2015); online archive through national library of Sweden (E).
Switzerland	1800	- **Neue Zürcher Zeitung*** (1800 to 2015); online newspaper archive ($; E).
United Kingdom	1800	- **Financial Times*** (1888 to 2015); online newspaper archive ($; E).
United States	1851	- **The New York Times** (1851 to 2015); online archive through ProQuest Historical Newspapers ($; E). - The Wall Street Journal* (1889 to 2015); online archive through ProQuest Historical Newspapers ($; E).

The table reports the premier (national) newspaper outlet (**in bold**) together with additional newspaper sources that we used for our electronic and manual search of corporate scandals in a country. We also report the earliest year for which newspaper sources are available. An asterisk (*) indicates a newspaper with a strong business focus/section; a dollar sign ($) indicates that the electronic archive does not offer free access, but needs a subscription; E stands for electronic archive that is accessible through key word search; M stands for archive that requires manual search (e.g., microfilm or hardcopies).

TABLE 2

Examples of Classification of Corporate Scandals from the United Kingdom

Year **Event** (*Classification*)	Classification Criteria (1) Does the event involve one or more financial reporting practices?	(2) Are these practices either morally or legally wrong under local customs or jurisdiction?	(3) Does the event trigger material (negative) consequences for corporate outsiders?	(4) Does the event cause a public outcry and discussion?
1845 **2nd Railway Mania** (*Accounting Scandal*)	- Inflated sales - Capitalized costs	- Accounting fraud - Bribery of politicians - Insider trading	- Bankruptcy - Many middle class families lost their entire savings	- Extensive coverage in *The London Times* and *The Economist*
1878 **City of Glasgow Bank** (*Accounting Scandal*)	- Fictitious accounting entries to overstate assets and understate liabilities - Overvaluation of irrecoverable banking assets and other investments - Purchases of the bank's shares to maintain its market valuation	- Accounting fraud - Directors were convicted and sentenced to prison	- Bank collapsed - Deficiency of capital estimated at £5.19 million - Hundreds of firms folded as a result and the 1,200 shareholders and their families suffered greatly	- Extensive coverage in international media outlets (*The London Times*; *New York Times*) - The failure resulted in greater publicity "than had ever previously fallen to the lot of any business establishment" and was seen as "an event which would long be remembered by thousands in Scotland as the saddest and darkest in their history."
1965 **Fire, Auto & Marine Insurance** (*Near Accounting Scandal*)	- Reporting of non-existent investments - Insufficient cash flows	- Insurance fraud - Emil Savundra (founder) was convicted of fraud	- Left 400,000 previously insured motorists without insurance coverage	- Emil Savundra's lavish lifestyle drew attention of the U.K. media, which uncovered the evidence of a major fraud
1986 **The Guinness Affair** (*Near Accounting Scandal*)	- False accounting (minor effects) - The CEO's arrangement to purchase Guinness shares had not been revealed to the board. The CEO was said to have misreported this sum in Guinness's financial accounts.	- Inflation of Guinness share price to assist takeover bid for Distillers - Four businessmen were charged and convicted of criminal offences for price manipulation.	- After takeover of Distillers, Guinness share price tripled - Payment of large fees and other awards to parties involved in the scheme	- Front page coverage in international media outlets (*Financial Times*; *Wall Street Journal*)
1998 **GLH Derivatives and Griffin Trading Company** (*Other Scandal*)	- n.a.	- Firms went into default after a single trader lost £6.2 million (10 times exceeding his trading limit) on German derivative investments	- First default in the industry since collapse of Barings in 1995 - Forced closure by the regulator	- Extensive coverage in international media outlets (*BBC; The Independent; Wall Street Journal*)
2007 **Northern Rock** (*Other Scandal*)	- n.a.	- Financial distress due to investments in U.S. sub-prime mortgage debt	- Bank collapsed and was later nationalized - Bank run	- First U.K. bank run since Overend, Gurney & Co. in 1866 (also in our sample) - Front-page coverage in international media outlets (*Financial Times*, *Wall Street Journal*)

The table provides illustrative examples of corporate scandals in the U.K. that we identified in our data collection, and describes how we classify them as either "accounting scandal", "near accounting scandal", or "other scandal" for the empirical analyses based on the four criteria outlined in section 2.2.2.

TABLE 3

Sample Composition and Description by Country and Decade

Panel A: Number of observations, and incidents of corporate scandals and regulation by country

Country	Legal Tradition	Earliest Year	Country-Years	Corporate Scandals				Regulation			
				Account-ing	Near Accounting	Other	Total	Account-ing	Other	Supra-national	Total
Australia	English	1831	185	38	19	31	88	17	14	0	31
Austria	German	1800	201	20	6	18	44	12	12	8	32
Belgium	French	1831	179	10	12	26	48	22	14	8	44
Brazil	French	1875	141	14	8	16	38	29	5	0	34
Canada	English	1844	172	20	13	44	77	35	8	0	43
China	–	1878	138	69	26	32	127	32	28	0	60
Denmark	Scand.	1884	132	15	26	11	52	19	5	5	29
Egypt	French	1888	121	8	11	31	50	16	21	0	37
Finland	Scand.	1889	127	3	6	7	16	9	11	3	23
France	French	1826	184	48	35	48	131	34	15	8	57
Germany	German	1805	204	64	7	15	86	23	16	11	50
Greece	French	1830	169	4	14	14	32	18	14	8	40
India	English	1838	178	15	14	20	49	14	14	0	28
Israel	English	1932	84	1	6	8	15	26	15	0	41
Italy	French	1860	156	73	57	31	161	27	24	12	63
Japan	German	1874	142	127	35	65	227	40	19	0	59
Korea (South)	German	1920	91	25	17	32	74	23	27	1	51
Netherlands	French	1828	183	22	10	15	47	14	22	6	42
Poland	–	1920	89	19	15	40	74	11	5	3	19
Portugal	French	1864	152	11	21	29	61	34	3	5	42
South Africa	English	1880	136	26	19	52	97	26	14	0	40
Spain	French	1881	131	20	19	23	62	20	16	6	42
Sweden	Scand.	1831	185	30	18	35	83	17	13	4	34
Switzerland	German	1800	216	17	10	26	53	26	10	0	36
United Kingdom	English	1800	210	92	54	76	222	34	16	6	56
United States	English	1851	165	97	46	87	230	35	13	0	48
Total			4,071	888	524	832	2,244	613	374	94	1,081

(Continued)

TABLE 3—*Continued*

Panel B: Number of observations, and incidents of corporate scandals and regulation by decade

Decade	Number of Countries	Country-Years	Corporate Scandals				Regulation			
			Account-ing	Near Accounting	Other	Total	Account-ing	Other	Supra-national	Total
1800	4	35	0	0	0	0	1	0	1	2
1810	4	40	0	0	1	1	1	1	0	2
1820	6	46	0	0	2	2	0	0	0	0
1830	11	99	0	2	1	3	4	4	0	8
1840	12	116	2	2	11	15	7	2	0	9
1850	13	129	7	5	11	23	9	7	0	16
1860	15	146	9	5	12	26	12	7	0	19
1870	18	163	7	10	16	33	12	4	0	16
1880	23	208	10	15	28	53	14	9	0	23
1890	23	230	28	15	33	76	15	15	0	30
1900	23	230	37	23	19	79	19	10	0	29
1910	23	230	13	22	24	59	21	13	0	34
1920	25	250	24	21	42	87	23	11	0	34
1930	26	248	30	27	50	107	37	11	1	49
1940	25	205	4	7	12	23	27	15	0	42
1950	26	255	15	21	29	65	28	20	0	48
1960	26	254	35	13	21	69	32	10	1	43
1970	26	251	62	31	45	138	60	23	0	83
1980	26	260	57	50	74	181	59	25	16	100
1990	26	260	158	103	146	407	85	71	11	167
2000	26	260	264	101	167	532	117	83	50	250
2010	26	156	126	51	88	265	30	33	14	77
Total		4,071	888	524	832	2,244	613	374	94	1,081

The sample comprises the 12 countries with substantive accounting scandals in the past as identified in Jones [2011], the next 11 largest (in terms of GDP) OECD countries (we were unable to collect data for Mexico, Norway, and Turkey) plus Brazil, Egypt, and South Africa. It covers the years 1800 to 2015. This selection procedure yields a global sample of 26 countries spanning Africa, Asia, Europe, Latin America, North America, and Oceania for a period of more than 200 years. The table reports the beginning of the sample period, the number of country-years, and the number of corporate scandals and regulations by country (panel A) and decade (panel B). For the empirical analyses, we classify the corporate scandals that we identified in the data collection as either "accounting scandal", "near accounting scandal", or "other scandal" based on the four criteria outlined in section 2.2.2 (see also table 2). We classify the regulatory actions that we identified as either "accounting regulation", "other regulation", or "supranational regulation" based on how they affect a firm's financial reporting and whether they were drafted and decided upon at the national or supranational level. We measure corporate scandals in the year they are first covered in the financial press and media, and regulation in the year it is enacted. In panel A, we also indicate a country's legal tradition (source: La Porta et al. [1998]), and distinguish between English common law, French commercial code, German commercial code, and Scandinavian civil law countries.

TABLE 4

Descriptive Statistics for Variables Used in the Regression Analyses

Variables	N	Mean	Std. Dev.	P1	P25	Median	P75	P99
Media Mentions:								
SCANDAL_media	3,241	391.0	663.6	0	45	157	444	3,329
REGULATOR_media	3,241	404.9	691.5	0	25	113	463	3,863
Corporate Scandals:								
SCANDAL_acctg	4,071	0.134	0.341					
SCANDAL_acctg+near	4,071	0.201	0.401					
SCANDAL_tot	4,071	0.291	0.454					
Regulation:								
REGULATION_acctg	4,071	0.134	0.340					
REGULATION_acctg+oth	4,071	0.195	0.396					
REGULATION_tot	4,071	0.206	0.404					
Control Variables:								
GDP per Capita	4,048	6,159	6,588	507.4	1,624	3,162	8,306	25,256
Inflation	4,045	13.47	146.40	-19.94	0	2.68	7.51	114.20
Financial Crisis	3,987	0.106	0.308					

The sample comprises up to 4,071 country-year observations from 26 countries over the 1800 to 2015 period (see table 3). The table presents descriptive statistics for the variables used in the regression analyses. For the analysis of media mentions, we count the yearly number of times the terms "scandal" (*SCANDAL_media*) and "regulator" (*REGULATOR_media*) or the local equivalents are mentioned in the local (business) press. For the analysis of corporate scandals, we define the following binary indicators: We code the variable *SCANDAL* as '1' if there is a corporate scandal discovered in the financial press or media in a country and year, and '0' otherwise. We distinguish between pure accounting scandals (*_acctg*), accounting scandals plus near accounting scandals (*_acctg+near*), and all corporate scandals (*_tot*) when coding the *SCANDAL* variable (as indicated by the suffix). We code the variable *REGULATION* as '1' if there is a new or substantially amended regulation enacted in a country and year, and '0' otherwise. We distinguish between accounting regulation (*_acctg*), accounting and other regulatory activities (*_acctg+oth*), and all regulatory activities including supranational legislations (*_tot*) when coding the *REGULATION* variable (as indicated by the suffix). For details on the different categories, see section 2.2.2. In some specifications, we include controls for yearly *GDP per Capita* (measured in 1990 International Dollars; source: The Maddison-Project: http://www.ggdc.net/maddison/maddison-project/home.htm, 2013 version), and the annual percentage change in consumer price indices, *Inflation* (source: the online resources to Reinhart and Rogoff [2011]). *Financial Crisis* is a binary indicator marking the initial year of a bank crisis, stock market crash, currency crisis, inflation crisis, or sovereign debt crisis in a country. The financial crises definitions and data are from Reinhart and Rogoff [2011].

TABLE 5

Temporal Patterns of Media Mentions of the Terms "Scandal" and "Regulator" over the 1800 to 2015 Period

	ln(1 + *SCANDAL_media*$_t$) as Dependent Variable				ln(1 + *REGULATOR_media*$_t$) as Dependent Variable			
	(1) 1800-2015	(2) 1800-1945	(3) 1946-2015	(4) 1970-2015	(1) 1800-2015	(2) 1800-1945	(3) 1946-2015	(4) 1970-2015
Lagged Scandals and Regulation:								
ln(1 + *SCANDAL_media*$_{[t-1 \text{ to } t-3]}$)	0.875***	0.824***	0.871***	0.847***	0.031*	0.042*	0.028*	0.024
	(43.65)	(17.76)	(32.31)	(24.87)	(1.72)	(1.86)	(1.73)	(0.95)
ln(1 + *REGULATOR_media*$_{[t-1 \text{ to } t-3]}$)	0.062***	0.068	0.034*	0.045***	0.932***	0.828***	0.906***	0.908***
	(3.30)	(1.61)	(2.00)	(3.06)	(52.67)	(28.24)	(34.13)	(40.66)
Control Variables:								
ln(*GDP per Capita*$_{t-1}$)	0.080***	0.034	0.086**	-0.003	0.074***	0.097**	0.111**	0.070
	(4.03)	(0.58)	(2.52)	(-0.04)	(2.88)	(2.15)	(2.12)	(0.99)
ln(*Inflation*$_{t-1}$)	-0.044	-0.172**	-0.025	-0.056**	0.020	0.022	0.044	0.002
	(-0.97)	(-2.40)	(-0.45)	(-2.14)	(0.56)	(0.24)	(0.94)	(0.05)
Fixed Effects	Country	Country	Country	Country	Country	Country	Country	Country
Adjusted R-Squared	0.923	0.886	0.930	0.914	0.942	0.920	0.949	0.942
Observations	3,224	1,646	1,578	1,043	3,224	1,646	1,578	1,043

The table reports analyses of the lead-lag relation between scandals (of any kind) and regulations (of any kind) based on media mentions. The sample comprises up to 3,224 country-year observations from 24 countries over the 1800 to 2015 period (see table 3). The dependent variables are the numbers of times the terms "scandal" and "regulator" (or the local equivalents) are mentioned in the local (business) press in a year, *SCANDAL_media* and *REGULATOR_media*, respectively. The independent variables are: (i) the three-year backward-looking moving averages of the two dependent variables, (ii) *GDP per Capita*, and (iii) annual *Inflation*. We use the natural log of the raw values (plus one or, for inflation, plus the minimum sample inflation rate) as indicated, and lag all independent variables by one year. The table reports ordinary least squares (OLS) coefficient estimates and (in parentheses) *t*-statistics based on robust standard errors clustered by country. We include country fixed effects in the regressions, but do not report the coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).

TABLE 6

Temporal Patterns of Corporate Scandals and Regulation over the 1800 to 2015 Period

Panel A: Logit regression analysis of total corporate scandals and total regulation

	SCANDAL_tot$_t$ as Dependent Variable				*REGULATION_tot*$_t$ as Dependent Variable			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Lagged Scandals and Regulation:								
SCANDAL_tot$_{[t-1 \text{ to } t-3]}$	2.539***	1.726***	1.748***	1.467***	1.170***	0.426***	0.421***	0.296*
	(13.58)	(6.97)	(7.06)	(5.25)	(7.50)	(3.07)	(3.04)	(1.70)
REGULATION_tot$_{[t-1 \text{ to } t-3]}$	1.416***	0.656***	0.651***	0.572***	1.521***	0.918***	0.970***	0.879***
	(9.50)	(4.41)	(4.31)	(2.95)	(8.40)	(3.90)	(4.27)	(4.02)
Control Variables:								
ln(*GDP per Capita*$_{t-1}$)	–	0.773***	0.770***	0.804**	–	0.615***	0.602***	0.084
		(8.79)	(8.78)	(2.39)		(5.08)	(5.08)	(0.24)
ln(*Inflation*$_{t-1}$)	–	-0.101	-0.092	0.112	–	0.316***	0.324***	0.260**
		(-0.49)	(-0.44)	(0.49)		(3.42)	(3.39)	(2.22)
Financial Crisis$_{[t-1 \text{ to } t-3]}$	–	–	-0.106	-0.151	–	–	0.177	0.036
			(-0.60)	(-0.65)			(0.58)	(0.12)
Fixed Effects	C	C	C	C, Y	C	C	C	C, Y
Pseudo R-Squared	0.223	0.257	0.259	0.295	0.089	0.118	0.115	0.152
Observations	4,071	4,038	3,970	3,702	4,071	4,038	3,970	3,651

Panel B: Logit regression analysis of accounting scandals and accounting regulation

	SCANDAL_acctg$_t$ as Dependent Variable				*REGULATION_acctg*$_t$ as Dependent Variable			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Lagged Scandals and Regulation:								
SCANDAL_acctg$_{[t-1 \text{ to } t-3]}$	3.218***	1.604***	1.613***	1.185***	1.058***	0.080	0.080	-0.044
	(14.51)	(6.77)	(6.75)	(4.14)	(5.93)	(0.37)	(0.36)	(-0.26)
REGULATION_acctg$_{[t-1 \text{ to } t-3]}$	1.415***	0.653***	0.629**	0.537*	1.511***	0.942***	0.947***	0.901***
	(5.74)	(2.61)	(2.43)	(1.72)	(7.79)	(4.60)	(4.45)	(4.95)
Control Variables:								
ln(*GDP per Capita*$_{t-1}$)	–	1.050***	1.046***	1.290***	–	0.583***	0.577***	0.190
		(10.39)	(10.43)	(4.65)		(4.84)	(4.80)	(0.48)
ln(*Inflation*$_{t-1}$)	–	-0.440*	-0.437*	-0.073	–	0.176	0.208**	0.186*
		(-1.68)	(-1.65)	(-0.44)		(1.63)	(2.01)	(1.66)
Financial Crisis$_{[t-1 \text{ to } t-3]}$	–	–	0.184	0.092	–	–	0.206	-0.086
			(0.52)	(0.26)			(0.71)	(-0.26)
Fixed Effects	C	C	C	C, Y	C	C	C	C, Y
Pseudo R-Squared	0.222	0.281	0.279	0.281	0.062	0.088	0.085	0.113
Observations	4,071	4,038	3,970	2,963	4,071	4,038	3,970	3,406

(Continued)

TABLE 6—*Continued*

The table reports analyses of the lead-lag relation between corporate scandals and regulation based on our comprehensive data collection for 26 countries over the 1800 to 2015 period (see table 3). The dependent variables are binary indicators marking the incidents of corporate scandals (*SCANDAL*) and the enactment of regulation (*REGULATION*) in a country and year. For the analyses, we combine all corporate scandals with all regulatory activities including supranational legislations in panel A (as indicated by the suffix *_tot*), and pure accounting scandals with accounting regulation in panel B (*_acctg*). Depending on the specification, we include the following independent variables in the model: (i) the three-year backward-looking moving averages of the two dependent variables, (ii) *GDP per Capita*, (iii) annual *Inflation*, and (iv) the three-year backward-looking moving average of an indicator marking the initial year of a *Financial Crisis* in a country. See table 4 for details. We lag all independent variables by one year, and use the natural log of the raw values (plus one or, for inflation, plus the minimum sample inflation rate) if indicated. The table reports logit coefficient estimates and (in parentheses) *z*-statistics based on robust standard errors clustered by country. We include country (C) and year (Y) fixed effects in the regressions, but do not report the coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).

TABLE 7
Sensitivity Analyses for Main Specification

	SCANDAL_tot$_t$ as Dependent Variable				*REGULATION_tot*$_t$ as Dependent Variable			
	(1) Marginal Effects (Logit)	(2) OLS Regression Analysis	(3) Legal Tradition Fixed Effects	(4) Additional Lag of Predictors	(1) Marginal Effects (Logit)	(2) OLS Regression Analysis	(3) Legal Tradition Fixed Effects	(4) Additional Lag of Predictors
Lagged Scandals and Regulation:								
SCANDAL_tot$_{[t-1 \text{ to } t-3]}$	0.313***	0.458***	2.376***	1.351***	0.062***	0.079***	0.644***	0.422***
	(7.17)	(10.87)	(15.88)	(5.45)	(3.05)	(3.64)	(4.15)	(3.47)
REGULATION_tot$_{[t-1 \text{ to } t-3]}$	0.119***	0.147***	0.851***	0.751***	0.133***	0.214***	1.313***	0.963***
	(4.44)	(3.65)	(5.23)	(4.57)	(3.77)	(5.65)	(5.87)	(3.60)
Control Variables:								
ln(*GDP per Capita*$_{t-1}$)	0.140***	0.108***	0.462***	0.835***	0.089***	0.073***	0.379***	0.612***
	(9.30)	(8.37)	(8.88)	(8.53)	(5.56)	(5.53)	(3.19)	(5.32)
ln(*Inflation*$_{t-1}$)	-0.018	-0.025	-0.051	-0.112	0.046***	0.023*	0.396***	0.326***
	(-0.49)	(-1.55)	(-0.24)	(-0.51)	(3.34)	(2.05)	(6.99)	(3.32)
Fixed Effects	C	C	LT	C	C	C	LT	C
Pseudo (Adjusted) R-Squared	0.257	0.399	0.229	0.246	0.118	0.153	0.099	0.119

The table reports sensitivity analyses of the lead-lag relation between corporate scandals and regulation for 4,038 observations from 26 countries over the 1800 to 2015 period (see table 3). The dependent variables are binary indicators marking all incidents of corporate scandals (*SCANDAL_tot*), and the enactment of all regulatory activities (*REGULATION_tot*) in a country and year. We run the following variations of model 2 in table 6, panel A: (1) We estimate the marginal effects of the independent variables while holding all the other covariates at the respective means. (2) We estimate the model using ordinary least squares (OLS) regression instead of logit. (3) We replace the country fixed effects (C) with fixed effects for a country's legal tradition (LT). (4) We lag the three-year backward-looking moving averages of *SCANDAL_tot* and *REGULATION_tot* by two years instead of one. The table reports logit (OLS) coefficient estimates and (in parentheses) *z*-statistics (*t*-statistics) based on robust standard errors clustered by country (a country's legal tradition). ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).

TABLE 8

Analysis of Various Sub-Periods over the 1800 to 2015 Time Frame

Panel A: Logit regression analysis of total corporate scandals and total regulation

	SCANDAL_tot$_t$ as Dependent Variable				*REGULATION_tot*$_t$ as Dependent Variable			
	(1) 1800-2015	(2) 1800-1945	(3) 1946-2015	(4) 1970-2015	(1) 1800-2015	(2) 1800-1945	(3) 1946-2015	(4) 1970-2015
Lagged Scandals and Regulation:								
SCANDAL_tot$_{[t-1 \text{ to } t-3]}$	1.726***	1.373***	1.252***	0.582*	0.426***	0.186	0.531**	0.175
	(6.97)	(3.98)	(4.51)	(1.66)	(3.07)	(0.75)	(2.26)	(0.67)
REGULATION_tot$_{[t-1 \text{ to } t-3]}$	0.656***	0.565**	0.671**	0.105	0.918***	0.900***	0.512**	-0.063
	(4.41)	(2.41)	(2.29)	(0.36)	(3.90)	(3.68)	(2.17)	(-0.30)
Control Variables & Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included
Pseudo R-Squared	0.257	0.194	0.268	0.227	0.118	0.053	0.089	0.066
Observations	4,038	2,224	1,793	1,187	4,038	2,224	1,793	1,187

Panel B: Logit regression analysis of accounting scandals and accounting regulation

	SCANDAL_acctg$_t$ as Dependent Variable				*REGULATION_acctg*$_t$ as Dependent Variable			
	(1) 1800-2015	(2) 1800-1945	(3) 1946-2015	(4) 1970-2015	(1) 1800-2015	(2) 1800-1945	(3) 1946-2015	(4) 1970-2015
Lagged Scandals and Regulation:								
SCANDAL_acctg$_{[t-1 \text{ to } t-3]}$	1.604***	1.405**	0.973***	0.665**	0.080	0.477	0.150	0.254
	(6.77)	(2.24)	(3.55)	(2.13)	(0.37)	(0.97)	(0.46)	(0.75)
REGULATION_acctg$_{[t-1 \text{ to } t-3]}$	0.653***	0.930**	0.482	0.242	0.942***	0.679**	0.630***	0.110
	(2.61)	(2.05)	(1.08)	(0.68)	(4.60)	(2.01)	(2.69)	(0.45)
Control Variables & Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included
Pseudo R-Squared	0.281	0.153	0.292	0.244	0.088	0.068	0.063	0.057
Observations	4,038	2,096	1,793	1,187	4,038	2,224	1,793	1,187

The table reports analyses of the lead-lag relation between corporate scandals and regulation for 26 countries over various sub-periods from 1800 to 2015 (see table 3). The dependent variables are binary indicators marking the incidents of corporate scandals (*SCANDAL*) and the enactment of regulation (*REGULATION*) in a country and year. For the analyses, we combine all corporate scandals with all regulatory activities including supranational legislations in panel A (as indicated by the suffix *_tot*), and pure accounting scandals with accounting regulation in panel B (*_acctg*). We estimate model 2 in table 6, but only report the logit coefficient estimates and (in parentheses) *z*-statistics based on robust standard errors clustered by country for the lagged moving averages of the two dependent variables. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).

TABLE 9

Analysis of Various Sub-Samples over the 1800 to 2015 Period

	Developed Markets		Emerging Markets		Strong Rule of Law		Weak Rule of Law	
	(1) *SCANDAL*	(2) *REGUL.*	(1) *SCANDAL*	(2) *REGUL.*	(1) *SCANDAL*	(2) *REGUL.*	(1) *SCANDAL*	(2) *REGUL.*
Lagged Scandals and Regulation:								
$SCANDAL_tot_{[t-1 \text{ to } t-3]}$	1.352***	0.316*	2.521***	0.717***	1.115***	0.261	2.167***	0.628***
	(5.67)	(1.67)	(5.81)	(4.11)	(4.11)	(1.28)	(6.12)	(2.77)
$REGULATION_tot_{[t-1 \text{ to } t-3]}$	0.531***	0.985***	0.795***	0.582	0.564***	1.042***	0.560**	0.482
	(2.77)	(3.67)	(3.12)	(1.24)	(2.83)	(4.04)	(2.22)	(1.24)
Control Variables & Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included
Pseudo R-Squared	0.257	0.106	0.270	0.147	0.252	0.087	0.275	0.168
Observations	2,924	2,924	1,114	1,114	2,275	2,275	1,540	1,540

	English Legal Tradition		French Legal Tradition		German Legal Tradition		Scandinavian Legal Tradition	
	(1) *SCANDAL*	(2) *REGUL.*	(1) *SCANDAL*	(2) *REGUL.*	(1) *SCANDAL*	(2) *REGUL.*	(1) *SCANDAL*	(2) *REGUL.*
Lagged Scandals and Regulation:								
$SCANDAL_tot_{[t-1 \text{ to } t-3]}$	1.640***	0.559***	1.553***	0.114	1.445**	0.859*	1.239***	0.331***
	(2.95)	(2.80)	(6.18)	(0.43)	(2.44)	(1.68)	(5.27)	(3.04)
$REGULATION_tot_{[t-1 \text{ to } t-3]}$	0.570**	0.318	0.515*	0.754***	0.839***	1.493***	0.707	0.264
	(2.33)	(0.75)	(1.91)	(2.59)	(3.60)	(5.40)	(0.72)	(0.41)
Control Variables & Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included
Pseudo R-Squared	0.192	0.076	0.237	0.185	0.354	0.116	0.286	0.093
Observations	1,114	1,114	1,403	1,403	854	854	444	444

The table reports analyses of the lead-lag relation between corporate scandals and regulation for various sub-samples of the 26 countries over the 1800 to 2015 period (see table 3). The dependent variables are binary indicators marking all incidents of corporate scandals (*SCANDAL_tot*), and the enactment of all regulatory activities (*REGULATION_tot*) in a country and year. We analyze the following sub-groups: (i) developed versus emerging markets based on the classification in the *Morgan Stanley Capital International* database as of 2000; (ii) countries with strong versus weak rule of law based on the index scores from La Porta et al. [1997] and split by the sample median; and (iii) a country's legal tradition taken from La Porta et al. [1998]. We distinguish between English common law, French commercial code, German commercial code, and Scandinavian civil law countries. We estimate model 2 in table 6, but only report the logit coefficient estimates and (in parentheses) *z*-statistics based on robust standard errors clustered by country for the lagged moving averages of the two dependent variables. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).

TABLE 10
Analysis of Individual Sample Countries

Country (sorted by past *REGULATION)*	*SCANDAL_tot*$_t$ as Dependent Variable				Country (sorted by past *SCANDAL)*	*REGULATION_tot*$_t$ as Dependent Variable			
	SCANDAL_tot$_{[t-1 \text{ to } t-3]}$		*REGULATION_tot*$_{[t-1 \text{ to } t-3]}$			*SCANDAL_tot*$_{[t-1 \text{ to } t-3]}$		*REGULATION_tot*$_{[t-1 \text{ to } t-3]}$	
	Coefficient	*z*-statistic	Coefficient	*z*-statistic		Coefficient	*z*-statistic	Coefficient	*z*-statistic
Spain	3.001***	(4.34)	3.591***[1)]	(3.40)	Israel	3.152**	(2.20)	-0.721[1)]	(-0.80)
Israel	0.000	(0.00)	3.569**	(2.46)	Greece	3.096**[1)]	(2.52)	1.365	(1.41)
Denmark	2.670***	(2.91)	3.283***[1)]	(2.85)	Korea (South)	2.813***	(3.03)	0.645	(0.54)
Korea (South)	6.955***	(4.33)	2.793	(1.22)	India	2.430**	(2.46)	-2.540	(-1.51)
Austria	2.222***	(2.78)	2.495**	(2.23)	Italy	2.354***	(3.36)	1.425*	(1.83)
Sweden	3.115***[1)]	(5.31)	2.150**	(2.29)	Switzerland	2.166***[1)]	(3.28)	0.762	(0.73)
Greece	2.394**	(2.01)	2.143**	(2.03)	Austria	2.152**	(2.47)	1.350	(1.14)
Italy	3.358***	(4.97)	2.088***	(2.79)	Brazil	1.888**	(2.40)	1.589*	(1.86)
France	2.307***[1)]	(4.78)	1.959***[1)]	(3.27)	Finland	1.728*	(1.77)	1.524	(1.62)
Poland	3.382***[1)]	(4.13)	1.867	(1.44)	Sweden	1.607***	(2.71)	-0.169	(-0.16)
Brazil	3.088***	(3.69)	1.819*	(1.93)	Spain	1.558**	(2.37)	0.613	(0.74)
Australia	0.891	(1.48)	1.774**	(2.41)	United Kingdom	1.347***[1)]	(2.87)	0.516	(0.81)
China	2.799***[1)]	(4.22)	1.595**	(1.98)	Belgium	1.265	(1.61)	1.849***	(2.68)
South Africa	3.477***[1)]	(5.66)	1.512*[1)]	(1.90)	France	1.206**	(2.29)	1.851***	(2.99)
Portugal	1.694***[1)]	(2.62)	1.256**	(2.06)	Denmark	1.201	(1.56)	1.255	(1.16)
Netherlands	3.007***[1)]	(4.79)	1.233*	(1.78)	United States	0.905	(1.59)	0.577	(0.88)
Belgium	0.274	(0.38)	1.217*	(1.93)	Portugal	0.877	(1.08)	3.612***	(5.05)
United States	2.257***[1)]	(4.13)	1.049	(1.33)	Germany	0.846*	(1.65)	1.455**[1)]	(2.01)
Germany	3.525***[1)]	(6.13)	0.871	(1.07)	China	0.839	(1.42)	1.619**	(2.29)
Switzerland	3.287***[1)]	(5.24)	0.661	(0.63)	Australia	0.822	(1.16)	1.806**	(2.03)
Egypt	0.818	(1.16)	0.582	(0.82)	South Africa	0.797	(1.49)	2.009***[1)]	(2.90)
United Kingdom	2.588***[1)]	(5.67)	0.502	(0.86)	Netherlands	0.651	(1.04)	2.081***	(2.97)
India	2.006***	(2.64)	0.453	(0.38)	Poland	0.488	(0.68)	0.417	(0.41)
Japan	1.451***	(2.64)	0.256	(0.45)	Egypt	-0.133	(-0.17)	2.143***[1)]	(3.22)
Canada	0.703	(1.12)	0.223	(0.31)	Canada	-0.221	(-0.29)	0.057	(0.07)
Finland	2.318**	(2.15)	-0.023	(-0.02)	Japan	-0.455	(-0.79)	1.486**[1)]	(2.44)

The table reports analyses of the lead-lag relation between corporate scandals and regulation for the 26 individual sample countries over the 1800 to 2015 period (see table 3). The dependent variables are binary indicators marking all incidents of corporate scandals (*SCANDAL_tot*), and the enactment of all regulatory activities (*REGULATION_tot*) in a country and year. We include an intercept in the regressions, but only report the logit coefficient estimates and (in parentheses) *z*-statistics based on robust standard errors for the lagged moving averages of the two dependent variables. We report countries rank ordered by the magnitude of the lagged *REGULATION* or *SCANDAL* coefficient. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed). The superscript 1) marks coefficients that remain significant at the 10% level or better after including *GDP per Capita* and *Inflation* as control variables in the regressions.

TABLE 11

Spillover Effects from Other Countries (United Kingdom and France)

	Spillover from the United Kingdom		Spillover from France	
	(1)	(2)	(3)	(4)
	$SCANDAL_tot_t$	$REGULATION_tot_t$	$SCANDAL_tot_t$	$REGULATION_tot_t$
Lagged Domestic Scandals and Regulation:				
$SCANDAL_tot_{[t-1 \text{ to } t-3]}$	1.574***	0.334**	1.649***	0.359**
	(5.78)	(2.42)	(6.12)	(2.26)
$REGULATION_tot_{[t-1 \text{ to } t-3]}$	0.564***	0.928***	0.548***	0.851***
	(3.39)	(3.78)	(3.50)	(3.49)
Lagged Foreign Scandals and Regulation:				
$Foreign_SCANDAL_tot_{[t-1 \text{ to } t-3]}$	0.353**	0.192	0.288**	0.215*
	(2.53)	(1.33)	(2.19)	(1.71)
$Foreign_REGULATION_tot_{[t-1 \text{ to } t-3]}$	0.528**	0.289**	0.033	0.512***
	(2.57)	(2.02)	(0.27)	(3.57)
Control Variables:				
$\ln(GDP\ per\ Capita_{t-1})$	0.703***	0.565***	0.714***	0.489***
	(7.56)	(4.48)	(7.35)	(3.56)
$\ln(Inflation_{t-1})$	-0.042	0.341***	-0.025	0.318***
	(-0.20)	(3.73)	(-0.12)	(4.08)
Fixed Effects	C	C	C	C
Pseudo R-Squared	0.260	0.123	0.249	0.115
Observations	3,730	3,730	3,657	3,657

The table reports analyses of cross-country spillover effects for the lead-lag relation between corporate scandals and regulation for 26 countries over the 1800 to 2015 period (see table 3). The dependent variables are binary indicators marking all incidents of corporate scandals (*SCANDAL_tot*), and the enactment of all regulatory activities (*REGULATION_tot*) in a country and year. We estimate model 2 in table 6, but add the lagged three-year backward-looking moving averages of corporate scandals and regulation from another sample country to the model (as indicated by the prefix *Foreign_*) and exclude the respective country from the analysis. We test for spillover effects from the United Kingdom and France. The table reports logit coefficient estimates and (in parentheses) *z*-statistics based on robust standard errors clustered by country. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).

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