CEO ability, CEO reputation and corporate financial fraud:
International evidence

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Abstract

We examine the extent to which CEO ability and CEO reputation influence corporate financial fraud around the world. Based on 108,571 observations from 10,622 unique firms in 44 countries during the period 2000-2021, we document a significant negative relationship between CEO ability and corporate financial fraud, while a significant positive relationship between CEO reputation and corporate financial fraud. Further, we find that the impacts of CEO ability and CEO reputation are moderated by CEO power and national culture. our findings persist after we control for year, industry and country fixed effects and when we use an alternative proxy of the dependent variable, subsamples of developing and developed countries, non-financial industries, US and non-US firms, USUK and non-USUK firms, and controlling endogeneity using the PSM method, entropy balancing method, treatment effect model and a two-stage instrumental-variable approach. Our findings also have economic significance. One standard deviation increase in CEO ability will lead to a 2.6% decrease in the likelihood of financial fraud. One standard deviation increase of CEO outside directorship position increases the likelihood of financial fraud by 10.17%.

Keywords: CEO characteristics; Corporate financial fraud; CEO ability; CEO reputation; National culture; Fraud risk

JEL classification: G30 G32

1 Introduction

Financial statement fraud is a social and economic problem that has serious worldwide economic effects, receiving considerable attention from the business community, accounting profession, academicians, and regulators. Although the global financial management system has improved in recent years, the behaviour of financial fraud has not stopped: from Enron in 2001 and the WorldCom scandal in 2002 to Madoff in 2008 and General Electric Co. Accounting Scandal in 2016 and 2017. The Association of Certified Fraud Examiners estimates that at least 5% of the annual revenue of US-based firms is lost to fraud (ACFE, 2020). Financial fraud may make the company's financial status look good in the short term, but once it is exposed, it can lead to a crisis of trust, financial crisis, and even bankruptcy. In addition, it undermines public confidence, decreases shareholder value, causes misallocation of capital, and increases financial market instability (Rezaee, 2005).

Contemporaneous corporate finance emphasizes the importance of the CEO's characteristics for explaining the likelihood of financial fraud. Khanna, Kim, and Lu (2015) find that CEO connectedness can increase the likelihood of committing fraud and decreases the likelihood of detection. Griffin et al. (2021) also reveal the dark side of CEO social capital in that CEO social capital and real earnings management are positively related. Troy, Smith, and Domino (2011) suggest that CEO demographics, namely CEO age, CEO gender, CEO experience, CEO's degree and CEO stock options, can impact accounting fraud. CEO psychology such as narcissism has also been studied and has been shown to have a positive impact on fraud (Rijsenbilt and Commandeur, 2013). Wang and Demers (2011) suggest that young CEOs are less inclined to manage earnings. Schrand and Zechman (2012) find that overconfident managers tend to engage in fraudulent financial reporting. Peni and Vähämaa (2010) show that female CEOs have a lower probability of financial fraud.

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However, to the best of our knowledge, no one test directly focuses on the effect of CEO reputation and CEO ability on the likelihood of financial fraud. We acknowledge that there are studies on the impact of CEO ability and CEO reputation on earnings management or on the quality of financial information (Francis et al., 2008; Haider, 2016), yet neither poor-quality financial information nor earnings management is equal to financial fraud. We need to predict firm fraud because the majority of firms commit financial fraud without being caught (Karpoff et al. 2017). We herein focus on the impact of CEO personal attributes on firm fraud rather than CFO attributes because research has confirmed that CFO attributes are less important than CEO attributes, even for financial decision-making (Six et al., 2013). A CEO can set the tone from the top, dominating CFO's role. Moreover, Feng et al. (2011) find that CFOs are involved in material accounting manipulations due to pressure from CEOs. We fill this gap with this article.

Because CEO reputation, CEO ability and corporate financial fraud cannot be observed directly, following Flickinger et al. (2016), Sauerwald et al. (2016) and Lanis et al. (2019), we use CEO outside directorship to proxy for CEO reputation and measure CEO reputation by using the total number of external directorships held by CEOs during the year and identified in the BoardEx dataset. Following Milbourn (2003), Rajgopal, Shevlin, and Zamora (2006), and Weng and Chen (2017), we use industry-adjusted ROA to proxy for CEO ability. We then, following Dechow et al. (2011) and Chahine et al. (2021), use the F-score to proxy for corporate financial fraud. We analyze 108,571 observations from 10,622 unique firms in 44 countries between 2000 and 2021.

We document the following findings: First, we find a positive relationship between CEO reputation and the likelihood of financial fraud, and a negative relationship between CEO ability and the likelihood of financial fraud. This persists after we control for year, industry and country fixed effects and when we use alternative financial fraud measures (M-score),

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subsamples of developing and developed countries, non-financial industries, US and non-US firms, US&UK and non-US&UK firms, and controlling endogeneity using the PSM method, entropy balancing method, treatment effect model and a two-stage instrumental-variable approach. Second, we find a moderating effect of CEO power on financial fraud. CEO power can enhance the negative impact of CEO ability on corporate financial fraud, while it can reduce the positive effect of CEO reputation on corporate financial fraud. We also find evidence of a moderating effect of national culture. The positive relationship between CEO reputation and fraud is stronger in high individualism, low power distance, high masculinity, low uncertainty avoidance, high long-term orientation, and high indulgence countries. The negative relationship between CEO ability and fraud is stronger in high individualism, high power distance, high masculinity, high long-term orientation and low indulgence countries.

This study contributes to the modern corporate finance literature in several aspects. First, although researchers examine the relationship between CEO attributes and firm outcomes such as firm performance, firm value and earning quality, to the best of our knowledge, whether CEO ability and CEO reputation have a direct impact on the likelihood of financial fraud has still not been studied. Therefore, this paper aims to fill this gap by directly testing the relationship between CEO reputation, CEO ability and the likelihood of financial fraud. Second, based on international data, this thesis expands the perspective and geographic scope of the impact of CEO attributes on company outcomes to a world scope and further proves the validity of the upper-echelon theory. Besides, it contributes to the determinants of financial fraud. To date, the factors associated with financial fraud noticed by researchers are mainly institution-specific, industry-specific and firm-specific factors. To the best of our knowledge, no one has studied the influence of CEO ability and CEO reputation on the likelihood of financial fraud. We fill this gap by testing the impact of CEO ability and CEO reputation on the likelihood of firm fraud around the world.

Additionally, CEO power and national culture have a moderating impact on the relationship between CEO ability, CEO reputation and firm financial fraud. CEO power plays an important role in the process of the CEO's influence on the company. These findings strengthen the argument that based on the same institutional rules, CEO attributes can produce different corporate outcomes in culturally different societies.

Our research also has practical significance. The results will be of interest to regulators who are interested in the effects that CEO attributes can have on managerial behaviour. Firm policymakers can take into account CEO reputation, CEO ability, CEO power and cultural values when drafting firm policies that promote competitive business environments. To some degree, investors can judge the reliability of the company's financial information based on the CEO's ability and reputation.

The structure of the paper is as follows. Section 2 develops the literature review and hypotheses. Section 3 describes the sample and data. Section 4 outlines the research design and results. Section 5 presents the summary and conclusion.

2   Literature Review and hypothesis Development
2.1   Corporate financial fraud

Corporate financial fraud is defined as an unlawful act committed intentionally with a specific purpose such as manipulation, giving false statements or other forms of acts committed by certain parties either from within the organization or from outside the organization to benefit private or specific groups that directly or indirectly might harm others (Association of Certified Fraud Examiner, 2000, as cited in Sunardi and Amin, 2018), thereby benefiting the company and/or the CEO himself through misleading information, at the expense of other participants.

The 1999 COSO report shows that in the majority of these cases, the chief executive officer (CEO) and/or chief financial officers (CFOs) are associated with financial statement

fraud (Beasley et al., 1999). Even if not directly involved, a CEO may direct or enable others in committing financial statement fraud (Ermann and Lundman, 1978). Financial statement fraud can be motivated by the financial condition of the firm or a lack of resources (Beasley et al. 1999), by the desire to meet analysts' earnings targets (Dechow et al., 2003), or by poor corporate performance. The extant literature in finance finds a significant relationship between poor corporate performance and CEO dismissal (Ertugrul and Krishnan, 2011). To avoid CEO turnover resulting from poor corporate performance and the firms' poor financial condition, CEOs have motivations to engage in financial fraud. It is noteworthy that CEOs not only have economic incentives but also have psychological motivations to commit fraud. To enhance their personal reputation and improve their position in the managerial labour market, CEOs have motivations to manipulate financial statements to meet analysts' forecasts and shareholders' earning expectations, and prevent stock prices from falling.

2.2 CEO characteristics theory

The upper echelons theory is the seminal proposition of the influence of CEO attributes (Hambrick and Mason, 1984), which argues that executives' behaviour is based on their personal experiences, values, and personalities (Chatterjee and Hambrick, 2007). From this, the stream of research has shown that individual CEO characteristics are related to firm strategy (Chatterjee and Hambrick, 2007). At present, there are mainly two views on the influence of the CEO on the company, namely agency theory and stewardship theory.

Agency theory assumes that due to the separation of ownership and control (Fama, 1980; Fama and Jensen, 1983; Jensen and Meckling, 1976), the interests of a principal and an agent are not always in alignment. Managers have incentives to use corporate resources to build their personal empires, but this may harm shareholders' interests. For example, CEOs may be keen on luxury offices and expensive cars, increasing the size of the company, mergers and

acquisitions, etc. Similarly, rent extraction views that executives often use their power to increase compensation or improve working conditions, etc. Rent extraction behaviour itself does not create wealth for shareholders, and it is a transfer of wealth from shareholders to CEOs. The amount of rent that the executive withdraws is the portion of what he actually received in excess of what he should obtain (Bebchuk, Fried and Walker, 2002). Besides, due to the dispersion of equity and the lack of concentrated shareholders, shareholders are unable to supervise the day-to-day operations of CEOs all the time. Therefore, CEOs have a chance to conduct opportunistic behaviours. Another central point of agency theory is the incompatibility of levels of risk tolerance between principals and agents. To be specific, although CEOs can benefit from high short-term profitability and high-risk projects, the cost will be borne by the shareholders, who are most concerned with long-term earnings growth and share price appreciation.

In contrast with agency theory's economic man hypothesis, stewardship theory is based on the self-actualized man hypothesis. Executives are motivated by non-financial motivators, such as a sense of achievement and inner satisfaction in completing challenging tasks, and thus gain recognition within the company and in the executive labour market. According to Davis et al. (1997), steward CEOs' behaviour is pro-organizational and collectivistic. They focus on higher-order needs (self-achievement and self-actualization) and place the firm ahead of their personal interest. Similarly, the efficient contracting hypothesis argues that CEOs act in the best interest of the firm as a steward and their reputation is developed by working with different stakeholders, maximizing shareholders' wealth and benefiting all market participants (Fama, 1980). Although stewardship theory acknowledges differences in goals between CEOs and companies, in the long run, they are consistent. The ability, reputation and social status of the CEO are reflected in the company's success, such as performance, prestige and status in its

industry. Even when an action is not rewarding for CEOs personally, they may still act out of a sense of responsibility and norm-induced compliance (Etzioni, 1975).

Agency theory and stewardship theory have different understandings of the CEO's role. Agent or steward? This can cause fundamental differences in the structure and purpose of corporate governance. According to agency theory, the main purpose of corporate governance should be to limit the CEO's speculative behaviour and reduce agency costs. By offering incentives to CEOs like stock options and increasing monitoring costs, such as reports and audits, the interests of CEOs are tied to the interests of shareholders, and ultimately the interests of shareholders are maximized. However, stewardship theory suggests that corporate governance should give and support acceptable authority, worth and power to the CEOs to help them perform more effectively, and then maximize the interests of shareholders. The incorrect application of the two theories can have the opposite effect. We should first know what factors influence a CEO to behave more like a steward or an agent. Then, we can know when to use agency theory and when to use stewardship theory. Therefore, our research question is whether agency theory or stewardship theory is more applicable to the effect of CEO ability and CEO reputation on corporate fraud, or whether they are irrelevant. Specifically, will CEO ability and CEO reputation reduce or increase the likelihood of financial fraud?

2.3 Hypothesis development

2.3.1 CEO ability and corporate financial fraud

CEO ability means the perceived ability of CEOs to create value for stakeholders, building on past financial performance, investment efficiency and innovation, or a combination of these. Specifically, CEOs' managerial ability is associated with a better understanding of their firms' functioning and performance drivers (Cui et al., 2019), and better use of organisational resources (Demerjian et al., 2013). Besides, able CEOs have a higher capability to assess

potential business opportunities and investment projects and deal with uncertainty (Yuan et al., 2019). Even in the same corporate environment, different levels of CEO ability can affect different company outcomes. For example, more able CEOs are more likely to adopt innovative strategies (Chen et al., 2015) and undertake risky behaviour(Yung and Chen, 2018).

CEO ability can reduce the CEO's career concerns. As CEOs' ability increases, they are more valued by the labour market and consequently, they will have fewer career concerns (Cui et al., 2019; Gibbons and Murphy, 1992; Yuan et al., 2019). Conversely, when CEOs have more career concerns, they tend to demonstrate their capabilities to the managerial labour market to gain recognition and strengthen their positions (Cui et al., 2019). In this regard, capable CEOs who have fewer career concerns will be less likely do engage in corporate financial fraud. Although some papers, based on fraud diamond theory, argue that while able CEOs have the capabilities to do fraud with less likelihood of being detected than poor-ability CEOs, able CEOs have few motivations to commit fraud.

According to Baik, Farber, and Lee (2011), able CEOs can provide more accurate management earnings guidance to the market. Their study further suggests that able CEOs are more likely to provide voluntary earnings guidance to the market than their peers with low ability. Further, Gan (2019) finds that able CEOs are more likely to meet their firms' financial targets and are less likely to manipulate financial information, thus making them less likely to commit financial fraud. CEOs with higher ability tend to have higher investment efficiency and better use of company resources (Gan, 2019). Able CEOs tend to obtain good firm performance (Yuan et al., 2019), have less pressure to achieve firm profitability and have fewer motivations to engage in financial fraud. Therefore, we hypothesize that high CEO ability tends to lower the likelihood of financial fraud.

Hypothesis 1: *CEO ability negatively relates to corporate financial fraud.*

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2.3.2   CEO reputation and corporate financial fraud

CEO reputation is the accumulation of the CEO's past performance, leadership, management, organizational operations, and relationships with stakeholders (Watson, 2007). Similarly, Love et al. (2017) state that CEOs tend to build over time a personal reputation that can be seen as the totality of the enduring images that stakeholders form based on perceived CEO performance, credibility, charisma, integrity and values. Besides, Jian and Lee (2011) find that reputable CEOs have a higher likelihood of investing in positive NPV projects to achieve high performance. In this vein, we can infer that reputable CEOs can manage the company to achieve good financial results, rather than using financial manipulation to meet the firm's targets, which also fits the efficient contract hypothesis.

To preserve their career and reputation, reputed CEOs are skating on thin ice to avoid potential negative future outcomes (Zhang et al., 2012). CEOs tend not to conduct unethical behaviours, because once these are revealed, the reputation CEOs have accumulated over the years will be greatly impaired or lost. Once impaired, reputation is costly to rebuild (Cao et al., 2012). Although hard to build, reputation is easy to lose. Therefore, a reputable CEO is consistent with the company's goals, focuses on the company's long-term development, and will not engage in short-sighted behaviour.   Koh (2011) finds that managerial reputation is positively related to conservative accounting practices and is less likely to result in opportunistic earnings management. From the aspects of reputation sources and career protection, a high-reputation CEO tends to improve the performance of the company, provide more accurate and conservative financial information, and reduce the possibility of financial fraud.

CEO reputation also has dark side. CEO reputation is mainly the image of the CEO as perceived by the managerial labour market, and it does not necessarily lead to high company performance. However, it does increase the public's expectations of celebrity CEOs, making

the expectations higher than normal (Anderson, 1973). To maintain their status, reputable CEOs are more likely to do some agent-like behaviours. For example, reputable CEOs tend to restrict bad news and report good news in a timely manner to maintain their reputation (Ball, 2001; Roychowdhury and Watts, 2007). According to Francis et al. (2008), reputed CEOs are associated with both poorer discretionary earnings quality and poorer total earnings quality, a finding that is consistent with the rent extraction hypothesis or matching hypothesis. Besides, Malmendier and Tate (2009) show that superstar CEOs earn higher compensation but generate poorer performance for a firm when compared with firms with a non-reputed CEO. They further suggest that after a CEO has achieved superstar status, they are more likely to be involved in earnings management to meet analysts' earnings expectations. In this vein, reputable CEOs have a conflict of interest with the company. They have motivations to meet stakeholders' performance expectations by misreporting financial statements, thus enhancing their personal status and extracting rent from the company.

We argue that CEOs with higher reputations are more motivated to commit financial fraud to meet company and industry expectations. The higher the reputation, the greater the gap between expectations and their real capabilities, which in turn increases the likelihood of financial fraud. Therefore, we expect that CEO reputation is positively related to the likelihood of financial fraud.

Hypothesis 2: CEO reputation is positively associated with corporate financial fraud.

2.3.3 The moderating effect of CEO power and national culture

Will CEO power moderate the relationship between CEO ability and CEO reputation and the likelihood of financial fraud? Empowering CEOs is a very common phenomenon in corporate governance (Dalton et al., 2007). In many companies, the CEO is also the chairman of the board, which is a "double-edged sword". This is the result of weighing unified and efficient

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command and the independent supervision of the board of directors. A powerful CEO undermines the effectiveness of corporate governance (Haynes and Hillman, 2010). The main structural mechanism to reduce this "opportunism" in management is the board of directors, whose impartiality is compromised. According to agency theory, powerful CEOs will sacrifice shareholders' interests, strengthen their interests, and conduct rent-seeking behaviours, thus harming company value.

Powerful CEOs tend to maintain an opaque information environment, leading to more severe agency problems (Liu and Jiraporn, 2010). Due to information asymmetries, opportunities for financial reporting fraud arise (Ndofor et al., 2015). Dechow et al. (1996) find that firms manipulating earnings are more likely to have boards dominated by CEOs who simultaneously serve as chairman of the board, who is also the firm's founder, and are less likely to have an audit committee and outside blockholder. From the agency view, powerful CEOs tend to behave as an agent, with more self-interest, increasing the probability of financial fraud. O'Connor et al. (2006), based on a sample of 130 publicly traded firms, find that CEO duality can increase the likelihood of fraudulent financial reporting and also interact with the board and CEO stock options to further impact fraudulent reporting.

On the contrary, stewardship theory and organisational theory argue that CEOs with power can efficiently and effectively utilize company resources and perform in the best interests of shareholders (Abid et al., 2014; Davis et al., 1997; Martin and Butler, 2017). He and Wang (2009) find that CEO duality can strengthen the already positive effect of innovative knowledge assets on firm performance. Less powerful CEOs have less impact on company outcomes. Managerial discretion theory postulates that if managers' power is restricted, then their personal preferences, and attributes, are less likely to affect firm results (Wangrow et al., 2015). From this perspective, a powerful CEO can influence the board to set more accurate financial goals and release more accurate financial information. More accurate and reasonable

financial goals increase the likelihood of achieving financial goals, thereby reducing the likelihood of committing financial fraud. In addition, even if the performance of a powerful CEO falls below the target set by the company, this does not have much impact on their compensation because powerful CEOs tend to increase the fixed portion of their compensation and reduce the performance-contingent portion (Westphal and Zajac, 1995). Therefore, even if their performance is lower than expected, they do not lose much income and, therefore, have fewer motivations to manipulate financial reports than CEOs whose compensation is highly tied to company performance.

We argue that empowering able CEOs allows able CEOs to perform their functions more effectively, utilize the company's resources, and improve their performance, obtaining good financial results and further reducing the possibility of financial fraud. Therefore, it is hypothesized that:

Hypothesis 3 a: The negative relationship between CEO ability and corporate financial fraud is enhanced by CEO power.

Power enables reputed CEOs to influence the formulation of the company's financial targets, thereby narrowing the gap between expectations of the board and the CEO's true capabilities, reducing the likelihood that the CEO cannot achieve financial goals, and finally reducing the likelihood of financial fraud. Therefore, we expect that:

Hypothesis 3 b: The positive relationship between CEO reputation and corporate financial fraud is reduced by CEO power.

2.3.4   The moderating effect of national culture

Is there a moderating role of national culture on the relationship between CEO ability and CEO reputation and the likelihood of financial fraud? Watson (2003) finds that people with different

cultural heritage have significantly different attitudes towards corporate fraud. Given the widespread literature on national culture, we capture national cultural effects by using the national culture framework (Hofstede, 2001, 2011; Hofstede et al., 2015), which consists of six dimensions: individualism/collectivism, power distance, uncertainty avoidance, masculinity/femininity, long-term/short-term orientation, and indulgence/restraint.

"Individualism stands for a society in which the ties between individuals are loose. Oppositely, collectivism stands for a society in which people from birth onwards are integrated strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty" (Hofstede, 2001, p. 225). Individualistic cultures place greater emphasis on individual self-interest and expression. In this regard, CEOs in individualistic countries tend to have more incentives and rationalization to engage in unethical behaviours, which harms firm value but is beneficial for CEOs themselves. According to Cullen, Parboteeah, and Hoegl (2004), individualistic cultural values set the stage for firm behaviours that emphasize the pursuit of firm self-interest, largely neglecting concern for ethical consequences. Besides, individualistic cultural values encourage firm decision-makers to choose firm goal achievement beyond concerns for the ethical or legal means to achieve goals (Messner and Rosenfeld, 2002). Managers of collectivist cultures tend to look after the best interests of overall stakeholders and therefore are less likely to be involved in fraud. However, opponents argue that when fraud does occur, people in collectivist cultures consider it more important to maintain harmony. In collectivist countries, employees see themselves as part of the company, and even when they find that someone in their group is committing fraud, they tend to be reluctant to report it, because if the fraud in the group is exposed, the interests of the entire group will be lost. In this vein, collectivist countries are more likely to breed fraud.

Power distance represents the extent of authority inequality. "The extent to which the less powerful members of institutions and organizations within a country expect and accept

that power is distributed unequally" (Hofstede, 2001, p. 98). According to Scholtens and Dam (2007), in high power distance cultures, inequality in the distribution of resources can be characterized by relatively low regard for ethics. Thus, powerful people in high power distance countries may ignore the views and attitudes of other members and commit fraud for their personal benefit (House et al., 2004). Both people with power and without power view this kind of behaviour as acceptable. Less powerful people may even participate in the fraud and become accomplices by obeying the authority of those with high power, while in low power distance cultures, people are more sensitive to ethical issues due to a strong belief in the protection of the rights of all people (Chan and Cheung, 2012). Based on 66 countries, Mihret (2014) finds that firms in countries with high power distance are more likely to experience high fraud risk exposure. However, according to Parboteeah, Bronson, and Cullen (2005), people in a high-power distance culture not only tend to be obedient to powerful class but also follow laws and regulations. From this perspective, if people in countries with high power distance are more likely to obey the law, then they are less likely to commit fraud, compared to people in countries with low power distance. Therefore, high power distance can deter unethical behaviour. These two implications may generate contradictory results, especially when authority figures do not follow rules and commit fraud.

Uncertainty avoidance has nothing to do with risk avoidance, nor with following rules. Instead, it has to do with anxiety and distrust in the face of the unknown, and conversely, with a wish to have fixed habits and rituals and to know the truth (Hofstede et al., 2015). Therefore, in countries with high uncertainty avoidance, people may tend to take measures to reduce future uncertainty. According to Nadler and Breuer (2019), earnings management tends to be more prevalent in countries with high uncertainty avoidance. To some extent, the management is trying to control the company's annual report through earnings management, so that the company's earnings can go according to plan. However, some argue that countries with high

uncertainty avoidance are more likely to pay attention to and prevent unethical behaviours and establish mechanisms to reduce the risk of fraud. Gray (1988) argues that firms in countries with high uncertainty avoidance are more like to adopt conservative accounting practices methods. Similarly, Guan et al. (2005) find that discretionary accruals are negatively associated with uncertainty avoidance.

Long-term orientation deals with change. People in Long-term-oriented are more frugal, conserve resources and emphasize long-term goals rather than immediate rewards, while people in short-term-oriented countries are more prone to profligacy, using resources generously and achieving quick results (Hofstede et al., 2015). Thus, given the relative importance attached to current earnings in short-term-orientated countries, there may be greater use of earnings manipulation to speed up the positive impact of management decisions on current profits. Mihret (2014) argues that corporates in a long-term-oriented society tend to proactively anticipate and respond to possible future risks. However, people in a short-term orientation society have personal steadiness and stability and are not easily impacted by others, and they have universal guidelines about what is good and evil (Hofstede, 2011). They believe that traditions are sacrosanct and an important goal for them is to serve others. Conversely, the moral values of people in a long-term-oriented society are easily influenced by the circumstances (Hofstede, 2011). This may lead to the fact that occasional corporate fraud is acceptable in the modern economy, even if it does not fit the traditional notion of right and wrong.

Hofstede (2001) again suggests that masculinity, versus its opposite, femininity, is a societal rather than an individual characteristic. Both women and men in masculine societies emphasize performance and are assertive and ambitious, while those in feminine culture are modest and caring. This indicates that people in a masculine society are more likely to risk engaging in fraudulent behaviours to meet financial targets. Kanagaretnam, Lim, and Lobo

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(2011) show a significant positive association between masculinity and earnings management, which is akin to management fraud. However, Hofstede (2011) also argue that the religion of a masculine society focuses on God or gods, while a feminine society emphasizes fellow human beings and is less concerned with religion. Parboteeah, Walter, and Block (2015) find that religious people are more inclined to obey rules and feel shame when they do not follow the rules set by legitimate sources. Religion generally does not support manipulation and opportunism (Liu and Wu, 2020). Thus, the effect of masculinity on corporate fraud is theoretically contradictory.

Many papers fail to note the impact of indulgence on firm results. Indulgence represents society's high tolerance for individuals' pursuit of entertainment and enjoyment of life, allowing people's desires to be released more freely. A restrained society is one in which the natural needs of individuals are controlled and regulated by strict social norms (Hofstede, 2011). Maintaining order in a nation with high indulgence is not given a high priority (Hofstede, 2011). We can, therefore, infer that it is more likely for people in an indulgent society to sacrifice corporate interests in pursuit of personal interests. However, people in a restrained society can also engage in unethical behaviours because their lives are bounded by society, and the state of repression instigates them to perform immoral acts to release their suppressed nature. Generally, indulgent countries are happier than restrained societies (Hofstede, 2011; Liu and Wu, 2020). Therefore, the effect of Indulgence on corporate fraud is also mixed.

Accordingly, the following hypotheses are formulated:

Hypothesis 4 A: The negative relationship between CEO ability and corporate financial fraud is stronger in countries with a culture characterized by high individualism, high power distance, high masculinity, high uncertainty avoidance, high long-term orientation and restrained countries.

Hypothesis 4 B: The positive relationship between CEO reputation and corporate financial fraud is stronger in countries with a culture characterized by high individualism, low power distance, high masculinity, low uncertainty avoidance, high long-term orientation, and indulgent countries

Figure A.1 presents the conceptual framework of this paper, which summarises the hypotheses within this study. A plus sign (+) indicates a positive relationship between the two variables and a minus sign (-) indicates a negative relationship.

[Insert Figure A.1 here]

3 Data

3.1 Data and sample selection

We use international data, focusing on 44 countries, over the period 2000-2021. Because Boardex was founded in 1999, we choose to start in 2000 and end in 2021 to obtain better data and ensure that the data is close to the current economic environment. We match BoardEx data with Compustat and Datastream (CEO-related data and firm, industry-related data) to obtain merged data, and then merge the data with the national culture index from Hofstede's website, and finally, our full data contains a total of 108,571 firm-year observations (10,622 listed firms).

Our empirical analysis requires data to be obtained from a variety of databases. Financial data is mainly from Compustat and Refinitiv Workspace. CEO reputation and other CEO personal characteristics are mainly from the BoardEx database. Following Ji et al. (2021), we adopt the Hofstede framework from Geert Hofstede's website to measure national culture (Hofstede et al., 2015). We obtain industry segment data from the Compustat segment data file. We show the data collection sources and filtering process in **Table A 1. Table A 2** represents a detailed distribution of the sample firms by country.

Although our sample size for financial data is large enough, CEO perspective and corporate governance perspective data are relatively lacking. Dealing with missing data carefully is important. To be specific, we kept the dependent variable and independent variable original to avoid biased results. For the control variables, if the missing data was large enough, we left it to keep the data unbiased. For data with time series properties, where the missing values were less than 3 percentages, we performed a regression to get the predictor variables. Otherwise, we exclude missing values from the analysis (Briggs et al., 2003). To avoid the impact of extreme values, the data was winsorised at 1% and 99%.

3.2   Measurement of main variables

3.2.1   Dependent variable: corporate financial fraud

There are mainly two proxies of financial fraud. Firstly, the number of reported cases of financial fraud. While this is accurate, the disadvantage is that many firms committed fraud but were not caught. Therefore, this number may be not accurate. Furthermore, it is based on historical data and cannot represent future financial fraud.

To predict financial reporting fraud, we follow Dechow et al. (2011) and calculate Dechow's F-Score as the proxy for financial fraud, which has been used by various studies to predict fraud or assess fraud risk (Beatty et al., 2013; Bollen and Pool, 2012; Chahine et al., 2021; Davidson et al., 2015; Donelson et al., 2017; Hopkins et al., 2014; Purda and Skillicorn, 2015) Specifically, Beatty et al. (2013) test whether their results differ "based on the Dechow et al. (2011) ex-ante fraud detection probability", and Davidson et al. (2015) predict that fraud firms have a "higher fraud risk as measured by the F-score". Chahine et al. (2021) test the relationship between CEO network centrality and the likelihood of financial reporting fraud using the F-score.

To be specific, the F-score is a function of accruals, change in receivables, change in inventory, percentage of soft assets, change in cash sales, change in return on assets, and issuance of debt or equity during the last year. The details of the F-score calculation are presented in Appendix: **Dechow F-score construction.**

3.2.2 Independent variable: CEO ability, CEO reputation

Because CEO reputation cannot be observed directly, we use the number of board seats held by the CEO during the year as a proxy (Cai et al., 2020; Fich and Shivdasani, 2007; Lanis et al., 2019). The economic interpretation is that the greater number of external board seats held by a CEO, the more popular the CEO is in the labour market and the greater his reputation (Flickinger et al., 2016). Outside directorship is a common way of capturing social status in the studies of senior executives and board directors (Flickinger et al., 2016; Sauerwald et al., 2016) In particular, serving as members of other corporate boards reflects social recognition.

Following Milbourn (2003), Rajgopal, Shevlin, and Zamora (2006) and Weng and Chen (2017), we use industry-adjusted ROA to measure CEO ability. The industry-adjusted ROA evaluates the performance of the CEO in the previous three years by the average difference between the ROA of the company for which the CEO works and the ROA of the industry in which the company is classified. Higher industry-adjusted ROA represents higher CEO ability.

3.2.3 Moderating variable: CEO power and national culture

Previous studies on CEO power use the concentration of titles in the CEO position as a measure of power (Morse et al., 2011; Schopohl et al., 2021; Sheikh, 2019; Tang et al., 2011; Tang, 2021). The concentration of the titles of "CEO", "chair" of the board, and "president" of the company reduces the board's monitoring power and increases CEO power (Hayward and

Hambrick 1997). We create a dummy variable CEO power that equals 1 if the CEO also holds the position of chairman or president, and 0 otherwise.

We adopt Hofstede's framework for measuring national culture (Hofstede, 1980, 2001, 2011; Hofstede et al., 2015) namely, power distance (PDI), individualism/collectivism (IDV), masculinity/femininity (MAS), uncertainty avoidance index (UAI), long-term/short-term orientation (LTO) and indulgence/restraint (IVR). These are all integer scores from which we construct dummy variables. If a company's score is higher than the sample median, then it takes the value 1, and 0 otherwise. For the six dimensions, value 1 means that the country's culture is more individualistic/high power distance/masculinity/high uncertainty avoidance/long-term orientation/indulgence, and a value of 0 means collectivism/low power distance/femininity/low uncertainty avoidance/short-term orientation/restraint. The median values of PDI, IDV, MAS, UAI, LTO and IVR are 56, 52.5, 52.5, 66.5, 47 and 49 respectively.

3.2.4   Control variables

We include some control variables that have been shown to affect a firm's fraud behaviours. Following Khanna, Kim, and Lu (2015), we control for firm characteristics, namely firm size, using the log of the total book value of assets. Firm leverage is equal to total debt divided by total assets. Firm performance, using earnings before interest, and taxes divided by the book value of total assets. We further control the market-to-book ratio as a proxy for firm growth (Chahine et al., 2021). Litigation intensity equals 1 if the firm operates in a litigious industry, and 0 otherwise (Lamoreaux, 2016; Wang, Winton, and Yu, 2010). A litigious industry is defined as being one of the following SIC industries: 2832-37, 3569-78, 3599-675, 5199-62, and 7370-80.

In the second set of controls, we account for management-related variables, namely CEO gender, CEO age and CEO social networking. The gender of the CEO may be related to

corporate fraud; female CEOs can lower the probability of financial irregularities (Habib and Hossain, 2013; Gupta et al., 2020). CEO age has a discontinuous effect on financial reporting quality (Huang et al., 2012). Chahine et al. (2021) proved that CEO social networking can lower the probability of financial fraud; therefore, we control for it using the log of the network size of CEOs.

We also control corporate governance characteristics. First, board independence, measured as the proportion of outside directors on the board, matters because prior research suggests a negative relationship between independent boards and fraudulent financial reporting (Beasley et al., 2000). We also control for audit committee independence, following Khanna, Kim, and Lu (2015), using the percentage of independent directors on the audit committee. Gender diversity on the board can decrease corporate misconduct (Cumming et al., 2015), and we proxy this using the proportion of male directors on the board. We report the definition of the variables in **Table A 3 Variable definition**.

3.3 Empirical model

We employ the following equation to estimate the regression of financial fraud on CEO reputation and a set of control variables:

$$Fraud_{i,t} = \beta_0 + \beta_a CEO\ Characteristics_{i,t} + \sum \beta_m Control\ variables_{i,t}$$
$$+ \sum \beta_n Fixed\ Effects + \varepsilon_{i,t}$$

$$(1)$$

Where i denotes the firm and t denotes the year. The dependent variable ($Fraud$), explanatory variables of $CEO\ characteristics$ (CEO ability and CEO reputation) and $control\ variables$ are described in detail in paragraph 3.2.4. The coefficient β_a is our main interest. The acceptance of Hypothesis 1 requires the coefficient on CEO ability to be significantly negative. To support Hypothesis 2, the coefficient of CEO reputation should be positive. β_m is the coefficient matrix

of control variables, namely firm characteristics, CEO attributes and corporate governance characteristics. All regressions include year, industry and country fixed effects with robust standard errors.

To examine whether CEO power affects the sensitivity of financial fraud to CEO characteristics, we expand our regression model as below:

$$Fraud_{i,t} = \beta_0 + \beta_a CEO\ Characteristics_{i,t} + \beta_2 CEO\ Power_{i,t}$$
$$+ \beta_3 CEO\ Characteristics_{i,t} \times CEOPower_{i,t} + \sum \beta_m Control\ variables_{i,t}$$
$$+ \sum Fixed\ effects\ Dummies + \varepsilon_{i,t}$$

$$(2)$$

We add new variables to Equation (2) compared with Equation (1). The CEO power takes 1 if the CEO is also the chairman. The control variables in Equation (2) are consistent with those in Equation (1). The coefficient (β_3) of the interaction term (*CEO Characteristics×CEO Power*) indicates how CEO power moderates the effect of CEO ability and CEO reputation on financial fraud. The interpretation of β_3 largely depends on whether H 1a and H 1b are supported in Eq. (1).

To examine whether national culture affects the sensitivity of financial fraud to CEO ability and CEO reputation, we expand our regression model as below:

$$Fraud_{i,t} = \beta_0 + \beta_a CEO\ Characteristics_{i,t} + \beta_b National\ Culture_{i,t}$$
$$+ \sum \beta_c CEO\ Characteristics_{i,t} \times National\ Culture_{i,t}$$
$$+ \sum \beta_m Control\ variables_{i,t} + \sum \beta_n Fixed\ effects\ Dummies + \varepsilon_{i,t}$$

$$(3)$$

We add the moderating variables of national culture into Equation (3), using six dummy variables in six separate regressions: Individualism equals one when people in a country tend to focus on self-interests rather than the interests of the society or group, and zero otherwise.

Power distance takes the value one when the country has a higher tolerance for power inequality, indicating that the voices of less powerful members may not be valued, and zero otherwise. Masculinity takes one when a society prefers achievement, heroism, assertiveness, and material rewards for success. Society being more competitive takes the value of one, and a value of zero if it advocates cooperation, modesty, caring for the weak and quality of life. Uncertainty avoidance takes one if society maintains rigid codes of belief and behaviour, and is intolerant of unorthodox behaviour and ideas, and otherwise zero. Long-term orientation takes one when society tends to focus on future success rather than immediate benefits, and zero otherwise. Indulgence takes one if a country has no strict social norms and encourages people to release desires and enjoy life, and zero otherwise. Countries where the dummy variable, national culture, takes the value of 1 are marked with an "H" symbol in **Table A 2 Sample distribution.** Throughout all model specifications, we include the same set of control variables as in Eq. (1).

The coefficient β_c of the interaction term (CEO $Characteristics \times National\ Culture$) indicates how national culture affects the impact of CEO ability and reputation on financial fraud. The interpretation of β_c largely depends on whether H 1 or H 2 is supported in Eq. (1), and we discuss this in later sections. Please refer to **Table A 3 Variable definition** for the definition of the variables.

3.4 Summary statistics

Table 1 reports the descriptive statistics for the variables used in regression analysis (not including indicator variables). The mean value of the likelihood of financial fraud (F-score) is 1, which is similar to Chahine et al. (2021). The mean (median) value of the number of boards on which a CEO has served (CEO directorship) is 2.7286 (2). CEO ability (industry-adjusted ROA) is 0.04 on average. The average CEO tenure in our sample is 5.4817 years. The statistics

also show that the average growth opportunity is 3.3004. The average firm performance (EBIT/Total assets) is 0.01. The average firm size (Total assets) is 7,164.4 million (USD). The average leverage ratio for our sample is 20%. The average CEO has an age (CEO age) of 60.70, and the mean value of CEO social networking is 1000.50. The percentage of male directors on the board (Board male ratio) is on average 87.92%. Finally, the percentage of independent directors on the board (Board Independence) and the audit committee (Audit Committee Independence) is 67.30% and 91.59% respectively.

[Insert Table 1 here]

Table 2 describes the correlations between the variables. It initially shows that corporate financial fraud (F-score) is positively associated with CEO reputation (CEO directorships), but negatively related to CEO ability. This preliminarily shows that high CEO ability may lead to a low probability of financial manipulation, but high CEO reputation tends to result in a high likelihood of financial fraud. The correlation among the control variables is relatively low, except for audit committee independence and board independence, which are highly related. Besides, firm performance and CEO ability are highly positively related, which is intuitive. We also do the VIF test to make sure our variables have no multicollinearity problem. The VIFs of all the explanatory variables are small, between 1.03 and 2.79, which does not raise any concerns about multicollinearity. VIF result is not shown in the paper to save space.

[Insert Table 2 here]

4 Empirical results

4.1 CEO ability, CEO reputation and corporate financial fraud

Table 3 reports the estimation results of the regression model from Equation (1) using pooled ordinary least squares (OLS) regressions with robust standard errors and including year, industry, and country fixed effects. Column (1) shows the regression outcome for the control

variables. All the control variables are significantly associated with financial fraud, except CEO gender. To be specific, CEO age and audit committee independence are negatively related to the likelihood of financial fraud. Other control variables are, basically, positively related to the likelihood of financial fraud. These results are generally in line with our expectations and the literature. Column (2) presents the results after CEO ability is added to the model. The coefficient of CEO ability shows a significantly negative (β = -0.148, $p < 0.01$) relationship between CEO ability and corporate financial fraud. However, Column (3) displays a significantly positive (β = 0.0166, $p < 0.01$) relationship between CEO reputation and corporate financial fraud. In Column (4), we add all the variables to the model and receive similar results. This shows that the relationship between CEO ability and corporate financial fraud is negative (-0.147) and significant ($p < 0.01$). The relationship between CEO reputation and corporate financial fraud is significantly positive (β = 0.0164, $p < 0.01$).

The results initially suggest a negative impact of CEO ability on the likelihood of financial fraud, while CEO reputation is positively related to corporate financial fraud, which supports our Hypothesis 1 and Hypothesis 2. Capable CEOs, more like corporate stewards, have long-term goals rather than short-sightedness. Besides, they are knowledgeable about the firm and the industry, and are confident about meeting the expectations of the company's stakeholders. The higher the ability, the better the ability to improve the company's cash flow problems and reduce the possibility of the company's current and future financial distress. Therefore, the more competent the CEO is, the less likely the company is to be financially fraudulent as they reduce the likelihood of financial fraud. However, as the number of CEO directorships increases, the public's expectations for star CEOs will increase, raising the expectations, and finally, they are more likely to commit financial fraud to achieve short-term financial goals. Thus, reputable CEOs tend to lead to a higher likelihood of financial fraud.

[Insert Table 3 here]

4.2   The moderating effect of CEO power

This section reports the results of whether and how CEO power moderates the relationship between CEO reputation and firm fraud. From stewardship theory (Davis et al., 1997) and organization theory (Boyd, 1995), CEO duality can promote the unity of leadership and CEO power, which enables CEOs to use the company's resources more effectively, while reducing costs such as the cost of CEO-chair information asymmetries. Powerful CEOs can effectively use their abilities. At the same time, CEO duality will reduce the CEO's short-sighted behaviour and focus on long-term development. Therefore, based on our main results of CEO ability and CEO reputation on financial fraud, we expect that CEO power can further reduce the negative impact of CEO ability on corporate fraud while mitigating the positive impact of CEO reputation on corporate fraud.

Table 4 shows the moderating role of CEO power on the relationship between CEO ability, CEO reputation and financial fraud. We first include CEO power and control variables in Model 1, where the coefficient of CEO power is significant and positive (β = 0.0203, p < 0.05). We then add CEO ability in Model 2 and Model 3 as the independent variable, where the coefficient of CEO ability in Model 2 shows that CEO ability is negatively (β = -0.0943) related to financial fraud, with a significance level of 1%. As represented in model 3, the interaction item between CEO ability and CEO power (CEO ability*CEO power) displays a statistically significant (p < 0.05) and negative (β = -0.120) coefficient, while the coefficient of CEO ability becomes insignificant, which indicates that only able CEOs with power can negatively impact on the financial fraud. We can initially conclude that only powerful able CEOs can reduce the likelihood of financial fraud.

Model 4 and Model 5 use CEO reputation as the independent variable. Firstly, both CEO reputation and CEO power in Model 4 show a significantly positive relationship (p < 0.05 or better) with financial fraud (F score). However, in Model 5, the interaction item (CEO

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reputation*CEO power) has a negative (β = -0.0218) impact on the F-score, with significance at the 5% level. This suggests that CEO power can weaken the positive relationship between CEO reputation and financial fraud. In Model 6, we add in all variables of interest and the results remain unchanged.

[Insert Table 4 here]

The results represented in **Table 4** support our Hypothesis 3. a and Hypothesis 3. b. There is an interesting finding that CEO power itself increases the likelihood of fraud, but only when CEOs have power, and financial fraud decreases as CEO ability increases. CEO power can also reduce the positive impact of CEO reputation on the likelihood of fraud.

4.3   The moderating effect of national culture

People inevitably make decisions under the influence of a certain cultural context, and CEOs are no exception. This section reports the results of whether and how national culture moderates the relationship between CEO ability, CEO reputation and firm fraud. This study employed Hofstede's cultural dimensions model as they are used widely, especially in cross-cultural studies in different fields like management, psychology and marketing (Soares, Farhangmehr and Shoham, 2007). This model categorizes national culture into six dimensions: individualism/collectivism, power distance, uncertainty avoidance, masculinity/feminity, long-term orientation/short-term orientation, and indulgence/restraint.

[Insert Table 5 here]

Models (1) – (6) present the results with different subsamples according to individualism, power distance and masculinity, where all coefficients of CEO ability are negative and significant, except for Models (1) and (5). If we compare the results in the same cultural dimensions, the coefficient of CEO ability is higher in Models (2), (4) and (6), respectively, which indicates that the impact of CEO ability on financial fraud is stronger for countries with high individualism, power distance and masculinity.

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Table 5 Models (7) – (12) present the results with different subsamples using uncertainty avoidance, long-term orientation and indulgence, where all coefficients of CEO ability are negative and significant, except for Model (8). The coefficient of CEO ability is higher in Models (8), (10) and (11), which indicates that the impact of CEO ability on financial fraud is stronger for countries with high uncertainty avoidance, high long-term orientation, and low indulgence.

In conclusion, we find empirical evidence to support that national culture has a moderating effect on the relationship between CEO ability and financial fraud. The negative relationship between CEO ability and fraud is stronger in countries with a culture characterized by high individualism, high power distance, high masculinity, high long-term orientation, and low indulgence.

[Insert Table 6 here]

Table 6 Models (1) – (6) present the results with different subsamples according to individualism, power distance and masculinity, where all coefficients of CEO reputation are positive, but only Models (1), (3) and (6) are statistically significant. Also, CEO reputation has higher coefficients in Models (2), (3) and (6), respectively, which indicates that the impact of CEO reputation on financial fraud is stronger for countries with high individualism, low power distance and high masculinity.

Table 6 Models (7) – (12) present the results with different subsamples using uncertainty avoidance, long-term orientation, and indulgence, where all coefficients of CEO reputation are positive and highly significant, except for Model (8). We find the coefficient of CEO reputation is higher in Models (7), (10) and (12), and can conclude that the impact of CEO reputation on financial fraud is stronger for countries with low uncertainty avoidance, high long-term orientation, and high indulgence.

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Concisely, the positive relationship between CEO reputation and fraud is stronger in countries with a culture characterized by high individualism, low power distance, high masculinity, low uncertainty avoidance, high long-term orientation, and high indulgence.

We find that national culture does have moderating influences on the effects of CEO reputation and financial fraud. However, it is notable that both CEO ability and CEO reputation have lower and insignificant impacts on corporate fraud in low individualism, low masculinity and high uncertainty avoidance countries.

4.4   Endogeneity issues

The results in **Table 3** are still subject to endogeneity issues between CEO ability, CEO reputation and financial fraud, although we added time, industry and country fixed effects variables to the pooled OLS model and used robust cluster standard errors to control for heteroscedasticity and autocorrelation. Specifically, the results may suffer from functional misspecification, endogeneity, or unobservable or omitted variable bias. Such bias and misspecification can produce inconsistent and incorrect inferences, providing misleading conclusions and inappropriate theoretical interpretations (Ullah et al., 2018). Indeed, this bias sometimes results in the wrong direction of the relationship between CEO ability, CEO reputation and financial fraud. To mitigate such a limitation relating to functional misspecification or common method variance and measurement errors of variables, unobservable or omitted variable bias, or reverse causality, we applied four different methods. These are propensity score matching (PSM), the entropy balancing method, the treatment effect, and IV two-stage least squares (IV-2SLS). The following subsections briefly elaborate on each of these regressions.

4.4.1   Propensity score matching

As stated earlier, multiple regressions may suffer from functional misspecification, and the tendency towards functional misspecification increases as the treatment group becomes dissimilar. PSM alleviates this concern by reducing the reliance on the specification of the relationship between the variables (Rosenbaum and Rubin, 1983). The counterfactual nature of PSM allows straightforward and intuitive entities of treatment effect, relaxing the assumptions regarding the functional relationship between the variables.

We match CEO ability with positive industry-adjusted returns with CEO ability with negative industry-adjusted returns, expecting that capable CEOs can use company resources more effectively and achieve higher returns than those who are less capable. We create a dummy variable that equals 1 if the firm's industry-adjusted ROA is positive, and 0 otherwise, and isolate the treatment group of firms with positive returns from those in the control group that does not have positive industry-adjusted ROA. Since the PSM produces a pseudo-random sample, any of the resulting differences between the means should merely reflect the treatment effect (firms with positive industry-adjusted ROA compared to firms with negative industry-adjusted ROA). Therefore, the mean difference between the treatment and control groups is different to establish the treatment effect. We then use the PSM technique in two stages. In the first stage, we run a binary probit regression and calculate the propensity score for each firm-year observation by pooling the treatment and control groups. To calculate the propensity score using binary probit regression, we include firm size, growth opportunities, firm performance, leverage, CEO age, CEO gender, CEO social networking, litigation intensity, board gender ratio, board independence, and audit committee independence, including industry, year and country dummies as the explanatory variables of the industry-adjusted ROA dummy. In the second stage, we calculated the propensity score using the nearest neighbour method without replacement subject to a 0.5 caliper to match each firm with positive industry-adjusted ROA

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with that of similar firms with negative industry-adjusted ROA. Finally, we find close matches

for 60,430 able CEO firm-year observations. Our final panel includes 120,860 observations.

Table 7 Panel A presents the PSM results of CEO ability and financial fraud, where

we find a negative marginal effect (β = -0.07, $p < 0.01$) of CEO ability on the likelihood of

financial fraud.

We also created a treatment group for CEO reputation by creating another dummy

variable equal to 1 if the CEO has one or more outside board seats and a control group with a

value of 0 if the CEO has no outside board seats. The close matches 50,300 reputable CEO

firm-year observations, and the final panel include 100,600 observations. Then, we run the

PSM technique again and the results are presented in **Table 7 Panel B**. We find that the

relationship between financial fraud and CEO reputation is negative (β = 0.09) and significant

($p < 0.01$). Overall, these results further support the baseline results that CEO reputation is

positively associated with corporate financial fraud.

[Insert Table 7 here]

We then run diagnostic testing to ensure that our matching is appropriate. **Figure 1**

shows the results.

[Insert Figure 1 here]

4.4.2   Entropy balancing technique

We then employ an entropy balancing technique (Hainmueller, 2012) to avoid manual iteration

for the balancing solutions and in order to not cause any loss in bias for the PSM estimations.

The following shows how we execute entropy balancing. We identify firms whose past

three-year industry-adjusted ROA is positive as our treatment group. The remainder of the

sample is regarded as the control group. Then, we conduct entropy balancing on all of the

control variables to ensure that the mean and the variance of the observations in the two groups

are similar. **Table 8** represents the covariate distribution of CEO ability and CEO reputation before and after entropy balancing, respectively.

[Insert Table 8 here]

Model (1) and Model (2) in **Table 9** display the regression results for the entropy-balanced sample. Model (1) shows the results using CEO ability as the independent variable. The coefficient of CEO ability is still negative and significant (β = -0.431, p < 0.01). Higher CEO ability is negatively associated with financial fraud. Model (2) presents the results using CEO reputation as the independent variable, showing that CEO reputation has a positive impact on financial fraud (β = 0.0199, p < 0.01).

[Insert Table 9 here]

Both the coefficients of the main independent variables in the PSM results and the entropy balancing results have economic significance, while for the consideration of policy impacts, the entropy balancing results should normally be preferred to PSM results. Specifically, one unit change in CEO ability will lead to a 0.431 decrease in the F-score, which means that the likelihood of financial fraud will be reduced by 43.1%. A 1% change in CEO reputation will lead to a 0.0199% decrease in the F-score, which means that each external board seat held by a CEO increases the likelihood of financial fraud by 1.99%.

4.4.3   Treatment effect

According to Shipman, Swanquist, and Whited (2017) and Islam et al. (2021), the PSM technique can not mitigate sample selection bias and endogeneity due to unobservable factors, which could have a joint impact on CEO attributes and financial fraud. An alternative to matching that may address the possible effect of such unobservable omitted variable bias is the treatment effect model.

Under this method, in the first stage, we estimate the following the selection model (Eq. (4) and Eq. (6)) and then use both the CEO ability dummy and CEO reputation dummy and all the control variables used in our baseline model as the explanatory variables (Eq. (5) and Eq. (7)). The selection models and test models are written as:

$$Fraud = a + b1 * CEO\ ability\ dummy + b2 * control\ variables + \varepsilon \qquad (4)$$

$$CEO\ ability\ dummy = c + d1 * CEOtenure + d2 * Ln(net\ cash\ flow) + \omega \quad (5)$$

$$Fraud = a + b1 * CEO\ reputation\ dummy + b2 * control\ variables + \varepsilon \qquad (6)$$

$$CEO\ reputation\ dummy = c + d1 * CEO\ outsider + d2 * Ln(firm\ size) + \omega \quad (7)$$

The independent variables of selection equations are supported by previous literature and suggest that CEO ability and CEO reputation are determined by a set of firm and CEO characteristics.

Table 10 Panel A column (1) shows the selection model for CEO ability (CEO ability dummy). The results show that firms with greater net cash flow and longer tenure CEOs are more likely to have capable CEOs who achieve a positive industry-adjusted ROA. All coefficients are significant ($p < 0.01$), indicating that they are significant in explaining CEO ability. The positive relationship found between CEO tenure and net cash flow and CEO ability provides some support for the contention that longer CEO tenure and greater net cash flow are more likely to lead to a capable CEO.

Table 10 Panel A column (2), presents the selection model for CEO reputation (CEO reputation dummy). The results show that firms with a bigger size and which hired CEOs from outside the firm are more likely to have reputable CEOs. All coefficients are significant ($p < 0.01$), indicating that they are significant in explaining CEO reputation. The positive relationship found between firm size and CEO outsider and CEO reputation provides some

support for the argument that big firms are more likely to hire reputable CEOs, and that an outside CEO is more likely to be a reputable CEO.

Table 10 Panel B reports the Wald test in the footer, indicating that we can reject the null hypothesis of no correlation between the treatment-assignment errors and the outcome errors for the control and treatment groups. The coefficients for athrho are significant at $p < 0.01$ in both Columns (1) and (2), indicating a high probability that CEO ability and CEO reputation are endogenously determined. Overall, CEO ability is found to be negatively associated with corporate financial fraud ($\beta = -0.846$, $p < 0.01$). CEO reputation is positively related to corporate financial fraud ($\beta = 0.337$, $p < 0.01$).

<div align="center">**[Insert Table 10 here]**</div>

Because our PSM, entropy balancing and treatment effect results remain consistent, our conclusion does not appear to be principally driven by selection bias.

4.4.4 Two-stage least squares estimation

Another way to address the potential endogeneity problem is the use of two-stage least squares (2SLS), which is an efficient way to deal with the problem of omitted variables and reverse causality (Wooldridge, 2002). Applying 2SLS could help us to isolate the effect of CEO ability and CEO reputation on financial fraud. For this purpose, Eq. (1) is re-estimated using 2SLS to identify and remove the potential endogeneity problem. To functionalise the 2SLS, the first step is to identify instrument variables that are correlated with CEO ability and CEO reputation respectively, but which are not related to financial fraud, except indirectly through a variable on the right-hand side of the equation.

We use CEO tenure as the first instrument variable of CEO ability. Dikolli, Mayew, and Nanda (2014), Milbourn (2003), and Huang and Sun (2017) argue that the length of the CEO's tenure reflects the level of their ability. Long CEO tenure means that the CEO's ability

has been assessed by the managerial labour market and the company's board of directors for a long time. We also use the industry median CEO ability of the firms in the same industry (by 2-digit SIC code) as the second instrumental variable. This variable is related to the CEO ability of a given firm, but it does not relate to the likelihood of financial fraud of a given firm.

When it comes to CEO reputation, we use firm size, CEO outsider and industry median CEO directorships as the instrument variables. Booth and Deli (1996) suggest that large companies have more opportunities to hire CEOs with high reputations, and at the same time, CEOs in large companies have more opportunities to have well-bonded relationships. Based on Milbourn (2003) and Jian and Lee (2011), CEOs appointed from the outside are associated with having a higher reputation. We use industry median CEO directorships as the third instrumental variable as well. We do not include firm size as a control variable when testing the relationship between CEO reputation and financial fraud using 2SLS because we treat firm size as an instrumental variable.

2SLS Equations:

$$CEO\ attributes_{i,t} = \beta_0 + \beta_1 * IV_{i,t} + \sum \beta_m\ Control\ variables_{i,t} +$$
$$Industry\ Dummy + Year\ Dummy + Country\ dummy + \varepsilon_{i,t}$$

(8)

$$Fraud_{i,t} = \theta_0 + \theta_1 E(CEO\ attributes)_{i,t} + \sum \beta_m\ Control\ variables_{i,t}$$
$$+ Industry\ Dummy + Year\ Dummy + Country\ dummy + \varepsilon_{i,t}$$

(9)

Where i denotes the firm and t denotes the year. The CEO attributes take two different definitions in two separate regressions, namely CEO ability and CEO reputation. When we use

CEO ability as the CEO attribute of interest, we include the same set of control variables as in Eq. (1). When we use CEO reputation as the CEO attribute, we include the same set of control variables except for firm size.

[Insert Table 11 here]

Table 11 provides the results for Eqs. (8) and (9) using IV-2SLS, testing the relationship between CEO attributes and financial fraud. Column (1) shows the results using CEO ability as the independent variable.

Column (1) shows that the coefficient on CEO ability (instrumented) is significant ($p<0.01$) and negative (β = -0.155). This supports the primary results of our study (**H 1**) and shows that there is a causal relationship between CEO ability and financial fraud, even after controlling for the potential endogeneity problem. The Durbin-Wu-Hausman test of endogeneity suggests that CEO reputation is not an endogenous variable (P = 0.9764). The F statistic (under-identification test using Kleibergen-Paap LM test) takes a value of 5.315 (p < 0.10), rejecting the null hypothesis that the instruments are uncorrelated with the endogenous regressors. Then, the weak identification test (**Cragg-Donald Wald F statistic**) is 16,000, which is greater than Stock-Yogo's (Stock et al., 2002) critical values in all specifications (the biggest one is 19.93). We reject the null hypothesis of weak instruments against the alternative hypothesis that the instruments are strong, i.e., the excluded instruments are correlated with the endogenous regressors (relevant instrument). The last test is the over-identification test. We use the Hansen J over-identification test to examine the validity of all instruments. The result gives a p-value of 0.2796 > 0.10. This means the over-identification restrictions are accepted, and the instruments are jointly valid and uncorrelated with the error term.

Column (2) presents the results using CEO reputation as a dependent variable. The coefficient on CEO reputation (instrumented) is significant ($p<0.01$) and positive (β=0.0433). This supports our primary results of the study (**H 2**) and shows that there is a causal relationship

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between CEO reputation and financial fraud, even after controlling for the potential endogeneity problem. The endogeneity test suggests that CEO reputation is an endogenous variable (P = 0.0291). The under-identification test's F-statistic takes a value of 19.408 (p < 0.01), rejecting the null hypothesis that the instruments are uncorrelated with the endogenous regressors. Then, the F-statistic of the weak identification test is 1,777.353, which is bigger than any Stock-Yogo's critical values (the biggest one is 22.30). We reject the null hypothesis of weak instruments against the alternative hypothesis that the instruments are strong. The overidentification test's p-value is 0.2149 > 0.10, which means the instruments are jointly valid and are uncorrelated with the error term.

The IV-2SLS method takes into account possible endogeneity and still produces consistent results, i.e., CEO ability is negatively associated with the probability of financial fraud, while CEO reputation is positively related to financial fraud. We then use standard deviations to assess the economic impact of CEO ability and CEO reputation on corporate financial fraud. To be specific, one standard deviation (i.e.,0.2) increase in CEO ability will lead to a 0.03 (-0.155×0.2 = -0.03) standard deviation decrease in the F-score, which means that the likelihood of financial fraud will be reduced by 2.6% (0.03×0.83×100%=2.6%). One-standard-deviation increase (i.e.,2.83) in CEO reputation (natural logarithm transformation) will lead to a 0.1225 (0.0433×2.83=0.1225) standard-deviation decrease in the F-score, which means that the likelihood of financial fraud will be increased by 10.16% (0.1225×0.83×100%=10.16%).

4.5   Further analyses

4.5.1   Alternative proxy of dependent variable: Beneish M-score

The results indicate that the ability of Dechow's F-score to detect fraud is high, whereby it predicts 73.17% of fraud cases correctly (Dechow et al., 2011). Nonetheless, in this section,

we consider an alternative measure of the dependent variable, which is the M-score, as a robustness test. The M-score, developed by Beneish (1999), has been proven to be an effective fraud prediction score by many researchers with a prediction rate of 69.51% (eg., Aghghaleh et al. 2016).

We then created a dummy variable, M dummy, to represent financial fraud, which is 1 when the M-score is greater than 2.22, and 0 otherwise. If the M-score is less than -2.22, it indicates that the company does not manipulate earnings in that period; on the contrary, if the M-score is more than 2.22, it is a signal that the company tends to be a manipulator. The details of the M-score calculation are shown in Appendix: **Beneish M-score construction**.

We run logit regression, using the M dummy as the dependent variable instead of the F-score, with the same control variables as in our baseline regression. The results are presented in **Table 12**.

[Insert Table 12 here]

Both Model (1) and Model (2) in **Table 12** prove our conclusion to be correct. Model (1) represents a negative correlation between CEO ability and financial fraud (β=-0.843, p<0.01). Model (2) represents a positive correlation between CEO reputation and financial fraud (β=0.0506, p<0.01). In conclusion, these results still support our findings that CEO attributes play an important role in predicting corporate financial fraud. Specifically, CEO ability is negatively associated with the probability of financial fraud, while CEO reputation is positively related to financial fraud.

4.5.2 Developed countries versus developing countries

To identify any significant difference in the results between developed countries and developing countries, we divide the sample into two subsamples, namely firms in developed

countries and firms in developing countries, according to the World Bank (2022) classification of high-income countries and non-high-income countries.

The results of Models (1) and (2) in **Table 13** show that CEO ability is negatively correlated with financial fraud in both the developing (β= -0.308; $p < 0.01$) and developed (β = -0.146; $p < 0.01$) subsamples. Models (3) and (4) represent that CEO reputation is positively associated with financial fraud in both the developing ($\beta = 0.00887$; $p > 0.10$) and the developed ($\beta = 0.0185$; $p < 0.01$) subsamples. Overall, our results remain unchanged. Further, CEO ability plays a greater role in developing countries than in developed countries in reducing the possibility of firm financial fraud. CEO reputation has an insignificant effect in developing countries, but in developed countries, it increases the likelihood of financial fraud.

[Insert Table 13 here]

4.5.3 Financial versus non-financial firms

A potential bias is that our regression results may be affected by financial industry data. Next, we examine whether the data from the financial industry has influenced our overall findings. Therefore, we divide the sample into two subsamples, which are financial industry companies (SIC from 6000 to 6999) and non-financial industry companies (SIC not from 6000 to 6999). We run the regression again, and the results are reported in **Table 13**.

Under the non-financial sample, Model (5) in **Table 13** represents a negative relationship between CEO ability and corporate financial fraud (β = -0.130, $p < 0.01$). Model (7) represents a positive correlation between CEO reputation and corporate financial fraud (β = 0.0199, $p < 0.01$). Our results remain the same even after excluding the observations from the financial industries.

4.5.4   US firms versus non-US firms and USUK firms versus non-USUK firms

The samples from the United States (4,434 firms, 54,377 observations) accounted for about 50% of our total sample. To a large extent, our regression results are largely driven by the observations from the United States. Therefore, we first only keep the observations of the United States, and re-estimate Eq. (1). Next, we regress the remaining non-US observations to check if the results change. In addition, the UK is the second-largest source country of our sample (1,074 firms, 11,750 observations). Similarly, we first estimate Eq. (1) using observations from the United States and the UK. We then perform the regression using observations that are not from the United States or the UK.

<div align="center">

[Insert Table 14 here]

</div>

The results of Models (1) and (2) in **Table 14** show that CEO ability is negatively correlated with financial fraud in both the US ($\beta = -0.0886$; $p < 0.05$) and non-US ($\beta = -0.2012$; $p < 0.01$) subsamples. Models (3) and (4) suggest that CEO ability is negatively associated with corporate financial fraud in both the US&UK ($\beta = -0.1558$; $p < 0.01$) and non-US&UK ($\beta = -0.1471$; $p < 0.01$) subsamples.

Models (5) and (6) in **Table 14** present that CEO reputation is positively associated with financial fraud in both the US ($\beta = 0.0226$; $p<0.01$) and the non-US ($\beta = 0.0188$; $p < 0.01$) subsamples. Models (7) and (8) suggest that CEO reputation is positively related to corporate financial fraud in both the US&UK ($\beta = 0.0316$; $p < 0.01$) and non-US&UK ($\beta = 0.0091$; $p < 0.10$) subsamples. Overall, our results remain unchanged.

5   Discussion and Conclusion

Motivated by recent studies on the influence of CEO attributes on company outcomes, and based on stewardship theory and agency theory, we directly test the effect of CEO ability and CEO reputation on corporate fraud. Our multivariate regression results suggest that CEO ability is negatively associated with the likelihood of financial fraud, and CEO reputation is positively associated with the likelihood of financial fraud. We argue that CEOs with high ability can efficiently use company resources and have less pressure to engage in financial fraud. However, reputed CEOs have incentives to engage in financial fraud to meet firm objectives, thus maintaining their reputation. We further support our findings by adopting PSM, the entropy balancing technique, the treatment effect model and IV-2SLS to address endogeneity. These results are robust, both in developing and developed countries, after excluding financial firms and US firms and using alternative dependent variables.

We also find that CEO power can enhance the negative impact of CEO ability on financial fraud and reduce the positive impact of CEO reputation on financial fraud. We consider that CEO power can increase the CEO's efficiency and align the company's goals with the CEO's true capabilities, thus further reducing potential motivations for committing financial fraud. In addition, when CEOs also held the chairman position, the duality could reduce the gap between firm expectations and the CEO's true ability, making the firm objectives more achievable, thereby reducing the likelihood of engaging in financial fraud. Finally, we find that national culture: individualism, power distance, masculinity, uncertainty avoidance, long-term orientation, and indulgence, as developed by (Hofstede 1980, 1991, 2011) significantly moderates the effects of CEO ability and CEO reputation.

We employed international data, meaning the market of 44 countries is representative and is not limited to a specific market context. Our findings are very meaningful for the corporate finance literature. Specifically, they support that CEO ability can reduce agency

problems and that an able CEO is consistent with the company's interests. Similarly, Demerjian et al. (2013) find that able managers are associated with fewer subsequent restatements, leading to high earnings quality. Besides, our findings also suggest that CEO reputation can increase agency problems. Comparably, Francis et al. (2008) suggest that reputed CEOs are associated with both poorer discretionary earnings quality and poorer total earnings quality.

Finally, we provide new and direct evidence regarding the dual influences of CEO ability and CEO reputation on corporate financial fraud at different levels of CEO power and in various cultural environments, contributing to the notion of upper echelons theory concerning the impacts of CEO attributes on firm outcomes.

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Appendix A: Data

Table A 1 Data collection

Panel A. Sources of Data

Data	Database
The likelihood of financial fraud	Self-constructed, based on the Compustat database, Refinitiv Workspace
CEO attributes	Boardex
National culture scores	Hofstede's website
Firm Characteristics	Refinitiv, Compustat
Corporate governance	Boardex

Panel B. Data filtering process

	Observations	Total
Start by combining Compustat and Boardex	143,139	143,139
After merging with Refinitiv Workspace	(26,493)	116,646
Drop firms with less than 3 consecutive years	(5,861)	110,785
Drop countries with less than 5 firms	(1,295)	109,490
Drop countries without Hofstede's national culture index	(919)	108,571
The final sample for empirical research		108,571

Table A 2 Sample distribution

Country	Firms	Obs.	PDI	IDV	MAS	UAI	LTO	IVR
Argentina	7	60	49L	46L	56H	86H	20L	62H
Australia	551	4,391	38L	90H	61H	51L	21L	71H
Austria	36	374	11L	55H	79H	70H	60H	63H
Belgium	60	724	65H	75H	54H	94H	82H	57H
Brazil	50	328	69H	38L	49L	76H	44L	59H
Canada	877	7,369	39L	80H	52L	48L	36L	68H
China	301	1,931	80H	20L	66H	30L	87H	24L
Denmark	49	426	18L	74H	16L	23L	35L	70H
Finland	14	99	33L	63H	26L	59L	38L	57H
France	362	3,779	68H	71H	43L	86H	63H	48L
Germany	320	2,962	35L	67H	66H	65L	83H	40L
Greece	34	393	60H	35L	57H	112H	45L	50H
Hong Kong	403	2,897	68H	25L	57H	29L	61H	17L
Hungary	5	39	46L	80H	88H	82H	58H	31L
India	217	1,462	77H	48L	56H	40L	51H	26L
Indonesia	29	196	78H	14L	46L	48L	62H	38L
Israel	78	599	13L	54H	47L	81H	38L	.
Italy	135	1,242	50L	76H	70H	75H	61H	30L
Japan	292	2,146	54L	46L	95H	92H	88H	42L
Luxembourg	31	269	40L	60H	50L	70H	64H	56H
Malaysia	66	449	104H	26L	50L	36L	41L	57H
Mexico	48	309	81H	30L	69H	82H	24L	97H
Netherlands	102	1,145	38L	80H	14L	53L	67H	68H
New Zealand	29	190	22L	79H	58H	49L	33L	75H
Norway	12	56	31L	69H	8L	50L	35L	55H
Pakistan	8	31	55L	14L	50L	70H	50H	0L
Peru	7	43	64H	16L	42L	87H	25L	46L
Philippines	47	279	94H	32L	64H	44L	27L	42L
Poland	18	117	68H	60H	64H	93H	38L	29L
Portugal	25	299	63H	27L	31L	104H	28L	33L
Republic Of Ireland	82	1,060	28L	70H	68H	35L	24L	65H
Russia	34	298	93H	39L	36L	95H	81H	20L
Singapore	171	1,291	74H	20L	48L	8L	72H	46L
South Africa	142	1,336	49L	65H	63H	49L	34L	63H
South Korea	47	310	60H	18L	39L	85H	100H	29L
Spain	98	992	57H	51L	42L	86H	48H	44L
Sweden	96	983	31L	71H	5L	29L	53H	78H
Switzerland	88	734	34L	68H	70H	64L	32L	45L
Taiwan	64	365	58H	17L	45H	69H	93H	49L
Thailand	49	288	64H	20L	34L	64L	32L	45L
Turkey	16	94	66H	37L	45L	85H	46L	49L
United Arab Emirates	14	89	80H	38L	53H	68H	23L	34L
United Kingdom	1,074	11,750	35L	89H	66H	35L	51H	69H
United States	4,434	54,377	40L	91H	62H	46L	26L	68H
Total	10,622	108,571						

This table provides the distribution of firms, observations, development status and the scores of national cultures: power distance index (PDI) and individualism/collectivism (IDV), Masculinity/Femininity (MAS), Uncertainty Avoidance Index (UAI), Long/Short-Term Orientation (LTO) and Indulgence Versus Restraint (IVR), based on Hofstede et al. (2010). The median values of PDI, IDV, MAS, UAI, LTO and IVR are 56, 52.5, 52.5, 66.5, 47 and 49 respectively. H/L after the culture score indicates whether the respective value is higher or lower than the median value across the sample. We excluded the Israel from our study of the effects of indulgence because of missing data.

Table A 3 Variable definition

Variables	Measurements
Dependent variable:	
F-score	A function of accruals, change in receivables, change in inventory, percentage of soft assets, change in cash sales, change in return on assets, and issuance of debt or equity during the last year.
M-score	A function of financial index: day sales in receivable index; gross margin index; assets quality index, depreciation index; sales, general and administrative expenses index; leverage index; total accruals to total assets index
Independent variable:	
CEO reputation	Ln (1+the total number of external directorships held by a CEO during the year)
CEO ability	$IAROA_{i,t} = \frac{1}{3}\sum_{k=1}^{3}[ROA_{i,t-k} - \left(\frac{\sum_{j=1}^{N} ROA_{j,t-k} - ROA_{i,t-k}}{N-1}\right)]$ Note: ROA is the net income of the year divided by total assets
Moderating variable:	
CEO power	A dummy variable that equals 1 if the CEO also holds the position of chairman or president, and 0 otherwise.
Individualism /collectivism	Dummy variable: Countries with a score above the median (52.5) are defined as high individualism countries (equals 1), and the rest as collectivist countries (equals 0).
Power distance index	Dummy variable: equals 1 if score > median value (56), and 0 otherwise
Masculinity/ femininity	Dummy variable: equals 1 if score > median value (53), and 0 otherwise
Uncertainty avoidance index	Dummy variable: equals 1 if score > median value (67), and 0 otherwise
Long/short-term orientation	Dummy variable: equals 1 if score > median value (47), and 0 otherwise
Indulgence/ restraint	Dummy variable: equals 1 if score > median value (49), and 0 otherwise
Control variables: **Firm Characteristics**	
Firm Size	Log of the total book value of assets.
Firm performance	Earnings before interest, and taxes, divided by the book value of total assets
Growth opportunities	Market value of equity to book value of equity as a proxy for firm growth
Leverage	Total debt divided by total assets
Litigation intensity	Which is equal to 1 if the firm operates in a litigious industry, and 0 otherwise. A litigious industry is defined as being one of the following SIC industries: 2832-37, 3569-78, 3599-675, 5199-62, and 7370-80.
CEO characteristics	
CEO age	Log of the CEO's age
CEO gender	A dummy variable that equals 1 if the CEO is male, and 0 otherwise.
CEO social networking	The natural logarithm of the number of overlaps through employment, education and other social activities in the BoardEx
Corporate Governance Characteristics	
Board independence	The percentage of independent directors on the board
Audit committee independence	The percentage of independent directors on the audit committee
Board male ratio	The percentage of male directors on the board

Appendix B: Dependent variable construction

Dechow F-score construction

$F\ score\ =\ Probability\ of\ financial\ fraud\ \ /\ \ Unconditional\ probability$

$Probability\ of\ financial\ fraud\ =\ e^{(predicted\ value)}/(1+e^{predicted\ value})$

$Predicted\ value$

$$= -7.893 + 0.790 RSST\_accruals + 2.518\ \Delta\ Receivables + 1.191\Delta\ INV$$
$$+ 1.979 SoftAssets + 0.171\Delta Cash\ sales - 0.932\Delta\ ROA$$
$$+ 1.029 Actual\ issuance$$

Where:

$RSST\ accruals = (\Delta\ WC\ +\ \Delta\ NCO\ +\ \Delta\ FIN)/\ Average\ total\ assets$

WC $=$ (Current assets – Cash and short term investments)–
(Current liabilities – Debt in current liabilities)

NCO $=$ (Total assets – Current assets – Investments and advances)
– (Total liabilities – Current liabilities – Long − term debt)

FIN $=$ (Short_term investments + Long_term investments)–
(Long_term debt + debt in current liabilities + Preferred stock)

Δ Receivables $= \Delta$ Accounts receivables/Average total assets

Δ INV $= \Delta$ Inventory/Average total assets

$SoftAssets\ \ =\ \dfrac{Total\ assets\ -\ PPE\ -\ Cash\ and\ cash\ equivalent}{Total\ assets}$

$Cash\ sales_t\ =\ Sales_t\ -\ \Delta\ Accounts\ receivable_t$

$\Delta Cash\ sales_t\ =\ \dfrac{CashSales_t\ -\ CashSales_{t-1}}{CashSales_{t-1}}$

$\Delta\ ROA\ \ =\ \left(\dfrac{Earnings_t}{Average\ total\ assets_t}\right) - (Earnings_{t-1}/Average\ total\ assets_{t-1})$

Actual issuance $=$ An indicator variable equals 1 if the firm issued securities
during year t, and 0 otherwise

Beneish M-score construction

$$M\ score\ = -4.84 + 0.920\ (DSRI) + 0.528(GMI) + 0.404(AQI) +$$
$$0.892(SGI) + 0.115(DEPI) - 0.172(SGAI) +$$
$$4.679(Accruals) - 0.327(LEVI) \qquad\qquad (10)$$

Where:

DSRI $= (Receivables_t/Sales_t)/(Receivables_{t-1}/Sales_{t-1})$

GMI $=$ Gross margin$_{t-1}$/Gross margin$_t$

AQI $= (1 - \dfrac{PPE_t + Current\ assets_t}{Total\ assets_t})/(1 - \dfrac{PPE_{t-1} + Current\ assets_{t-1}}{Total\ assets_{t-1}})$

SGI $= Sales_t/Sales_{t-1}$

DEPI $=$ Depreciation rate$_{t-1}$/Depreciation rate$_t$

SGAI $=$ (Sales, general, and administrative expense$_t$/Sales$_t$)/
(Sales, general, and administrative expense$_{t-1}$/Sales$_{t-1}$)

Accruals $= \dfrac{Income\ before\ extraordinary\ items_t - Cash\ flow\ from\ operations_t}{Total\ assets_t}$

LEVI $= \dfrac{Leverage_t}{Leverage_{t-1}}$

Figures A.1 Conceptual framework

Figure A.1 Conceptual framework of the impact of CEO ability and CEO reputation on corporate financial fraud moderated by CEO power and national culture with hypotheses
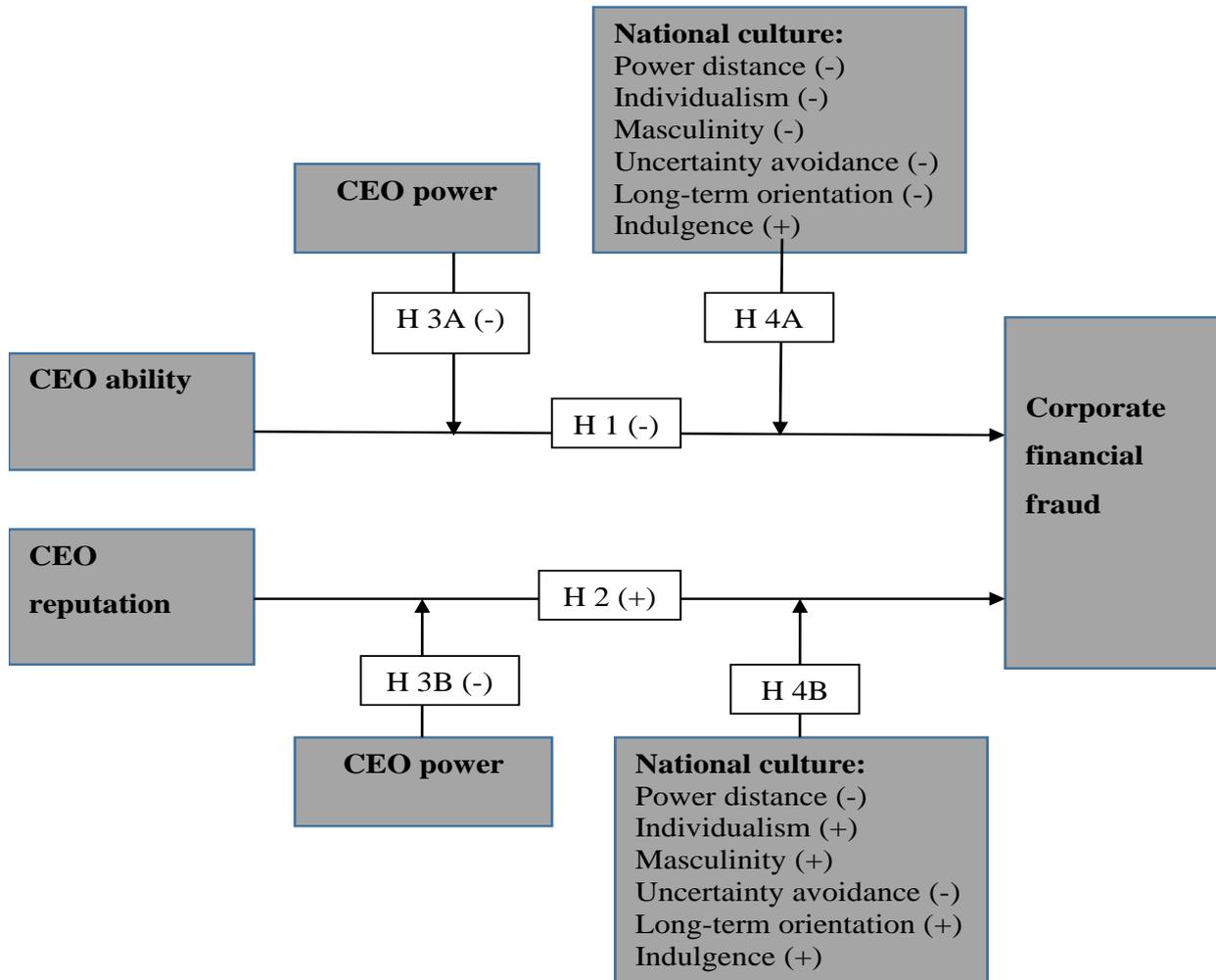
Table 1 descriptive statistics

Variable	Mean	St.D	Min	Max	p25	Median	p75
Dependent variable							
F-score	1.00	0.83	0.09	5.53	0.42	0.78	1.39
Alternative measure of the dependent variable							
M-score	-2.38	1.33	-5.43	6.69	-2.83	-2.54	-2.23
Independent variables							
CEO reputation	2.73	2.83	1.00	18.00	1.00	2.00	3.00
CEO ability	0.04	0.20	-0.92	0.67	-0.01	0.03	0.10
CEO characteristics							
CEO age	60.70	8.04	41.90	82.50	55.40	60.50	65.70
CEO power	0.85	0.36	0	1	1	1	1
CEO gender	0.97	0.18	0	1	1	1	1
CEO social networking	1,000.50	1,295.38	13	6,588	137	493	1,345
Firm characteristics							
Firm size (USD million)	7,164.40	21,717.07	2.77	164,971	189.81	952.02	4,025.57
Firm performance	0.01	0.21	-1.16	0.34	0.01	0.05	0.10
Growth opportunities	3.30	4.75	0.19	34.48	1.11	1.89	3.45
Leverage	0.20	0.20	0.00	0.89	0.02	0.15	0.31
Litigation intensity	0.29	0.45	0	1	0	0	1
Corporate governance							
Board male ratio (%)	87.92	12.13	50.00	100.00	80.00	88.90	100.00
Board independence (%)	67.30	22.51	0.00	100.00	53.85	73.33	85.71
Audit committee independence (%)	91.59	19.57	0.00	100.00	100.00	100.00	100.00

Note: table 1 provides the summary statistics for the dependent, independent and control variables, excluding dummy variables. After excluding duplicate observations, observations related to the utility industry, and firms with missing values, 84,348 firm-years have complete information on the CEO level, board level, and firm level from 2000 to 2021. Details of all variables are presented **in** Error! Reference source not found.**.**

Table 2 Pearson correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) F-score	1.00													
(2) CEO reputation (log)	0.02***	1.00												
(3) CEO ability	-0.05***	0.00	1.00											
(4) Firm size (log)	0.09***	0.21***	0.23***	1.00										
(5) Growth opportunities	0.01*	-0.04***	-0.06***	-0.09***	1.00									
(6) Firm performance	0.06***	0.05***	0.52***	0.43***	-0.07***	1.00								
(7) Leverage	-0.01***	0.07***	-0.05***	0.26***	0.09***	0.05***	1.00							
(8) Litigation intensity	0.12***	-0.04***	-0.10***	-0.08***	0.07***	-0.15***	-0.17***	1.00						
(9) CEO power	0.10***	-0.01***	-0.09***	-0.15***	-0.02***	-0.09***	-0.04***	0.086***	1.00					
(10) CEO gender	0.02***	-0.01**	0.01***	0.02***	-0.01**	0.02***	0.004	-0.02***	0.016***	1.00				
(11) CEO age (log)	0.04***	0.07***	-0.00	0.16***	-0.00	0.07***	0.04***	0.02***	0.07***	0.02***	1.000			
(12) CEO social networking (log)	0.10***	0.13***	0.02***	0.32***	0.08***	0.01***	0.11***	0.00	-0.02***	-0.05***	0.08***	1.00		
(13) Board male ratio (%)	0.01**	-0.05***	-0.08***	-0.23***	-0.07***	-0.10***	-0.07***	-0.01**	0.12***	0.25***	-0.02***	-0.14***	1.00	
(14) Board independence (%)	0.12***	0.01***	0.11***	0.39***	0.09***	0.15***	0.12***	0.01**	-0.07***	-0.01**	0.10***	0.28***	-0.17***	1.00
(15) Audit committee independence (%)	0.12***	0.03***	0.13***	0.49***	0.10***	0.21***	0.12***	0.01***	-0.14***	-0.01**	0.13***	0.30***	-0.14***	0.71***

. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3 The impact of CEO ability, CEO reputation on corporate financial fraud

Variables	(1)	(2)	(3)	(4)
	Corporate financial fraud			
CEO ability		-0.148***		-0.147***
		(0.0314)		(0.0313)
CEO reputation			0.0166***	0.0164***
			(0.00379)	(0.00404)
Firm size	0.0268***	0.0321***	0.0260***	0.0314***
	(0.00175)	(0.00183)	(0.00176)	(0.00185)
Growth opportunities	0.00861***	0.00584**	0.00872***	0.00598**
	(0.00264)	(0.00286)	(0.00264)	(0.00286)
Firm performance	0.123***	0.218***	0.125***	0.221***
	(0.0218)	(0.0309)	(0.0218)	(0.0309)
Leverage	0.0550***	0.0505***	0.0535***	0.0490***
	(0.0161)	(0.0172)	(0.0161)	(0.0172)
CEO age	-0.0197***	-0.0194***	-0.0205***	-0.0203***
	(0.00524)	(0.00592)	(0.00524)	(0.00592)
CEO gender	0.0185	0.0176	0.0198	0.0190
	(0.0146)	(0.0153)	(0.0146)	(0.0153)
CEO social networking	0.00439**	0.00403*	0.00354*	0.00315
	(0.00202)	(0.00213)	(0.00203)	(0.00214)
Litigation intensity	0.0346***	0.0311***	0.0347***	0.0313***
	(0.00970)	(0.0103)	(0.00970)	(0.0103)
Board male ratio	0.216***	0.211***	0.213***	0.209***
	(0.0255)	(0.0268)	(0.0255)	(0.0268)
Board Independence	0.000974***	0.00106***	0.000992***	0.00108***
	(0.000182)	(0.000196)	(0.000181)	(0.000196)
Audit Committee Independence	-0.000781***	-0.000699***	-0.000769***	-0.000688***
	(0.000185)	(0.000196)	(0.000185)	(0.000196)
Constant	-0.173**	-0.203**	-0.186**	-0.216**
	(0.0851)	(0.0928)	(0.0848)	(0.0924)
Observations	84,300	72,672	84,300	72,672
Adj R-squared	0.253	0.267	0.254	0.267
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes

Table 3 presents the results of the pooled ordinary least square (OLS) regression with cluster-robust standard errors of the CEO ability and CEO reputation reported and the likelihood of corporate financial fraud in Eq. (1). The dependent variable is the likelihood of corporate financial fraud, which uses F-score as the proxy, a function of accruals, change in receivables, change in inventory, percentage of soft assets, change in cash sales, change in return on assets, and issuance of debt or equity during the last year. CEO ability, proxy using the past three-year industry-adjusted ROA. CEO reputation is the natural log of 1 plus the total number of external directorships held by a CEO during the year. Firm size is the natural log of the total book value of assets. Growth opportunities use the firm's market value divided by book value. Firm performance is EBIT divided by total assets. Leverage is total debt divided by total assets. CEO age is the natural log of CEO age. CEO gender is a dummy variable that equals 1 if the CEO is a male, and 0 otherwise. CEO networking is the natural logarithm of the number of overlaps through employment, education, and other social activities in the BoardEx. Litigation intensity is equal to 1 if the firm operates in a litigious industry, and 0 otherwise. A litigious industry is defined as being one of the following SIC industries: 2832-37, 3569-78, 3599-675, 5199-62, and 7370-80. The Board male ratio is the proportion of male directors at the Annual Report Date selected. Board Independence is the percentage of independent directors on the board. Audit Committee Independence is the percentage of independent directors on the audit committee. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Table A 3 Variable definition.**

Table 4 Then moderating effect of CEO power on the relationship between CEO ability, CEO reputation and corporate financial fraud

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
			Corporate financial fraud			
CEO ability		-0.0943***	0.00903			0.0125
		(0.0354)	(0.0525)			(0.0526)
CEO reputation				0.0140***	0.0316***	0.0313***
				(0.00410)	(0.00773)	(0.00791)
CEO ability*CEO power			-0.120**			-0.123**
			(0.0518)			(0.0519)
CEO reputation*CEO power					-0.0218**	-0.0222**
					(0.00868)	(0.00894)
CEO power	0.0203**	0.0268***	0.0357***	0.0194**	0.0370***	0.0532***
	(0.00903)	(0.00942)	(0.0107)	(0.00903)	(0.0116)	(0.0134)
Firm size	0.0331***	0.0268***	0.0375***	0.0325***	0.0325***	0.0370***
	(0.00192)	(0.00942)	(0.00201)	(0.00193)	(0.00193)	(0.00203)
Growth opportunities	0.00537*	0.0374***	0.00234	0.00548*	0.00552*	0.00250
	(0.00293)	(0.00201)	(0.00316)	(0.00293)	(0.00293)	(0.00316)
Firm performance	0.123***	0.00256	0.196***	0.126***	0.126***	0.198***
	(0.0258)	(0.00316)	(0.0354)	(0.0258)	(0.0258)	(0.0354)
Leverage	0.0932***	0.194***	0.0936***	0.0918***	0.0925***	0.0930***
	(0.0173)	(0.0353)	(0.0184)	(0.0173)	(0.0173)	(0.0184)
CEO age	-0.0151**	0.0938***	-0.0103	-0.0160***	-0.0160***	-0.0113*
	(0.00615)	(0.0184)	(0.00652)	(0.00615)	(0.00615)	(0.00652)
CEO gender	0.0186	-0.0102	0.0144	0.0198	0.0201	0.0159
	(0.0153)	(0.00652)	(0.0161)	(0.0153)	(0.0153)	(0.0161)
CEO networking	0.00316	0.0146	0.00283	0.00234	0.00236	0.00203
	(0.00222)	(0.0161)	(0.00229)	(0.00223)	(0.00223)	(0.00230)
Litigation	0.0303***	0.00284	0.0289***	0.0304***	0.0305***	0.0292***
	(0.0102)	(0.00229)	(0.0108)	(0.0102)	(0.0102)	(0.0108)
Board male ratio	0.251***	0.0288***	0.245***	0.250***	0.248***	0.242***
	(0.0275)	(0.0108)	(0.0285)	(0.0275)	(0.0275)	(0.0285)
Board Independence	0.000888***	0.243***	0.00101***	0.000906***	0.000902***	0.00103***
	(0.000194)	(0.0285)	(0.000208)	(0.000194)	(0.000194)	(0.000208)
Audit Committee Independence	-0.000568***	0.00102***	-0.000457**	-0.000558***	-0.000552***	-0.000443**
	(0.000192)	(0.000208)	(0.000202)	(0.000192)	(0.000192)	(0.000202)
Constant	-0.226**	-0.000457**	-0.327***	0.0140***	-0.257***	-0.358***
	(0.0957)	(0.000202)	(0.0954)	(0.00410)	(0.0959)	(0.0956)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	71,013	62,040	62,040	71,013	71,013	62,040
Adjusted R-squared	0.282	0.295	0.295	0.282	0.282	0.296

Table 4 provides the results of the OLS regressions in which we examine how CEO power moderates the relationship between CEO ability, CEO reputation and corporate financial fraud. The dependent variable is the likelihood of corporate financial fraud, which uses the F-score as the proxy, a function of accruals, change in receivables, change in inventory, percentage of soft assets, change in cash sales, change in return on assets, and issuance of debt or equity during the last year. CEO ability, proxy using the past three-year industry-adjusted ROA. CEO reputation is the natural log of 1 plus the total number of external directorships held by a CEO during the year. A dummy variable that equals 1 if the CEO also holds the position of chairman or president, and 0 otherwise. CEO ability*CEO power and CEO reputation*CEO power are the interactions between CEO ability, CEO reputation and CEO power. Firm size is the natural log of the total book value of assets. Growth opportunities use the firm's market value divided by book value. Firm performance is EBIT divided by total assets. Leverage is total debt divided by total assets. CEO age is the natural log of CEO age. CEO gender is a dummy variable that equals 1 if the CEO is a male, and 0 otherwise. CEO networking is the natural logarithm of the number of overlaps through employment, education, and other social activities in the BoardEx. Litigation intensity is equal to 1 if the firm operates in a litigious industry, and 0 otherwise. A litigious industry is defined as being one of the following SIC industries: 2832-37, 3569-78, 3599-675, 5199-62, and 7370-80. The Board male ratio is the proportion of male directors at the Annual Report Date selected. Board Independence is the percentage of independent directors on the board. Audit Committee Independence is the percentage of independent directors on the audit committee. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Table A 3 Variable definition.**

Table 5 The moderating effect of national culture on the relationship between CEO ability and corporate financial fraud

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Individualism		Power Distance		Masculinity	
	Low	High	Low	High	Low	High
CEO ability	-0.1480	-0.1570***	-0.1439***	-0.2832***	-0.0807	-0.1611***
	(0.107)	(0.033)	(0.033)	(0.100)	(0.074)	(0.034)
Firm size	0.0163***	0.0355***	0.0336***	0.0250***	0.0274***	0.0331***
	(0.005)	(0.002)	(0.002)	(0.004)	(0.005)	(0.002)
Growth opportunities	0.0311***	0.0028	0.0029	0.0249***	0.0232**	0.0000
	(0.007)	(0.003)	(0.003)	(0.006)	(0.010)	(0.003)
Firm performance	0.1019	0.2150***	0.2029***	0.3272***	0.0760	0.2517***
	(0.095)	(0.032)	(0.032)	(0.089)	(0.080)	(0.033)
Leverage	-0.1221***	0.0673***	0.0825***	-0.1994***	0.0644	0.0427**
	(0.036)	(0.019)	(0.019)	(0.040)	(0.051)	(0.018)
CEO age	-0.0031	-0.0204***	-0.0210***	-0.0099	0.0010	-0.0380***
	(0.008)	(0.007)	(0.007)	(0.009)	(0.009)	(0.008)
CEO gender	0.0023	0.0160	0.0235	-0.0099	0.0200	0.0200
	(0.030)	(0.017)	(0.018)	(0.027)	(0.040)	(0.017)
CEO social networking	0.0032	0.0033	0.0019	0.0083*	-0.0050	0.0045*
	(0.005)	(0.002)	(0.002)	(0.005)	(0.006)	(0.002)
Litigation	0.0342	0.0302***	0.0169	0.1108***	0.1799***	0.0087
	(0.021)	(0.011)	(0.011)	(0.024)	(0.030)	(0.011)
Board male ratio	-0.0105	0.2502***	0.2287***	0.0258	0.0614	0.2252***
	(0.068)	(0.029)	(0.031)	(0.057)	(0.057)	(0.031)
Board Ind.	0.0019***	0.0009***	0.0011***	0.0013***	0.0004	0.0012***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Audit Ind.	0.0003	-0.0009***	-0.0009***	0.0002	-0.0002	-0.0009***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.5442***	-0.1530**	-0.2292**	0.3874	0.3985	-0.1631*
	(0.210)	(0.073)	(0.097)	(0.269)	(0.251)	(0.098)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,221	64,451	62,580	10,092	12,156	60,516
Adjusted R-squared	0.126	0.247	0.256	0.178	0.218	0.269

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Uncertainty Avoidance		Long-term orientation		Indulgence	
	Low	High	Low	High	Low	High
CEO ability	-0.1518***	-0.1829	-0.1043***	-0.2381***	-0.1976**	-0.1531***
	(0.032)	(0.115)	(0.036)	(0.060)	(0.090)	(0.033)
Firm size	0.0323***	0.0235***	0.0393***	0.0215***	0.0243***	0.0334***
	(0.002)	(0.005)	(0.002)	(0.003)	(0.004)	(0.002)
Growth opportunities	0.0058*	0.0053	-0.0029	0.0248***	0.0149***	0.0030
	(0.003)	(0.005)	(0.004)	(0.004)	(0.004)	(0.003)
Firm performance	0.2058***	0.4255***	0.1757***	0.2166***	0.2920***	0.2065***
	(0.032)	(0.118)	(0.036)	(0.059)	(0.079)	(0.033)
Leverage	0.0682***	-0.0876*	0.1434***	-0.2581***	-0.1154***	0.0830***
	(0.018)	(0.048)	(0.021)	(0.030)	(0.037)	(0.019)
CEO age	-0.0221***	-0.0061	-0.0168**	-0.0212**	-0.0145*	-0.0197***

	(0.007)	(0.010)	(0.007)	(0.009)	(0.008)	(0.007)
CEO gender	0.0296*	-0.0302	0.0272	-0.0065	-0.0041	0.0239
	(0.016)	(0.047)	(0.018)	(0.028)	(0.026)	(0.018)
CEO social networking	0.0023	0.0192***	-0.0024	0.0145***	0.0127***	0.0007
	(0.002)	(0.006)	(0.003)	(0.004)	(0.004)	(0.002)
Litigation	0.0160	0.1351***	0.0160	0.0543***	0.0989***	0.0141
	(0.011)	(0.026)	(0.013)	(0.017)	(0.019)	(0.012)
Board male ratio	0.1931***	0.1419***	0.2436***	0.0879**	0.0018	0.2253***
	(0.030)	(0.055)	(0.035)	(0.043)	(0.050)	(0.032)
Board Ind.	0.0011***	0.0008**	0.0011***	0.0004	0.0009***	0.0012***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Audit Ind.	-0.0008***	-0.0004	-0.0006	-0.0004*	-0.0000	-0.0010***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.1082	0.3127	-0.2421**	-0.1049	0.3895*	-0.2229**
	(0.073)	(0.308)	(0.107)	(0.111)	(0.218)	(0.100)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	64,483	8,189	49,876	22,796	12,696	59,976
Adjusted R-squared	0.255	0.243	0.282	0.167	0.173	0.248

Table 5 provides the results of the OLS regressions in which we examine how national culture moderates the relationship between CEO ability and corporate financial fraud. The dependent variable is the likelihood of corporate financial fraud, which uses the F-score as the proxy, a function of accruals, change in receivables, change in inventory, percentage of soft assets, change in cash sales, change in return on assets, and issuance of debt or equity during the last year. CEO ability, proxy using the past three-year industry-adjusted ROA. Firm size is the natural log of the total book value of assets. Growth opportunities use market value divided by book value. Firm performance is EBIT divided by total assets. Leverage is total debt divided by total assets. CEO age is the natural log of CEO age. CEO gender is a dummy variable that equals 1 if the CEO is a male, and 0 otherwise. CEO networking is the natural logarithm of the number of overlaps through employment, education, and other social activities in the BoardEx. Litigation intensity is equal to 1 if the firm operates in a litigious industry, and 0 otherwise. A litigious industry is defined as being one of the following SIC industries: 2832-37, 3569-78, 3599-675, 5199-62, and 7370-80. The Board male ratio is the proportion of male directors at the Annual Report Date selected. Board Independence is the percentage of independent directors on the board. Audit Committee Independence is the percentage of independent directors on the audit committee. We split the sample into different subsamples based on cultural dimensions and estimate Eq. (1) using the subgroups. In order, from model (1) to model (12) are based on individualism, power distance, masculinity, uncertainty avoidance, long-term orientation and indulgence respectively. Low or high culture dimensions are based on whether their scores are lower or higher than the median values of culture scores across the sample. Specifically, regressions in the model (1), (3), (5), (7), (9) and (11) are estimated for low score (below median) subsamples and in models (2), (4), (6), (8), (10) and (12) are for high score (above median) subsample. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Error! Reference source not found.**.

Table 6 The moderating effect of national culture on the relationship between CEO reputation and corporate financial fraud

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Individualism		Power Distance		Masculinity	
	Low	High	Low	High	Low	High
CEO reputation	0.0054	0.0212***	0.0221***	0.0093	0.0056	0.0221***
	(0.006)	(0.004)	(0.005)	(0.006)	(0.007)	(0.004)
Firm size	0.0100**	0.0293***	0.0275***	0.0190***	0.0251***	0.0262***
	(0.004)	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)
Growth opportunities	0.0350***	0.0056*	0.0056*	0.0284***	0.0241***	0.0030
	(0.007)	(0.003)	(0.003)	(0.006)	(0.009)	(0.003)
Firm performance	-0.0235	0.1190***	0.1168***	0.1046*	-0.0076	0.1587***
	(0.071)	(0.023)	(0.023)	(0.055)	(0.059)	(0.023)
Leverage	-0.1236***	0.0702***	0.0831***	-0.1771***	0.0474	0.0498***
	(0.034)	(0.018)	(0.018)	(0.038)	(0.045)	(0.017)
CEO age	-0.0085	-0.0217***	-0.0211***	-0.0164*	-0.0005	-0.0375***
	(0.008)	(0.006)	(0.006)	(0.008)	(0.008)	(0.007)
CEO gender	-0.0022	0.0198	0.0259	-0.0097	0.0171	0.0220
	(0.029)	(0.016)	(0.017)	(0.026)	(0.036)	(0.016)
CEO social networking	0.0041	0.0024	0.0012	0.0085*	-0.0087	0.0044**
	(0.005)	(0.002)	(0.002)	(0.004)	(0.005)	(0.002)
Litigation intensity	0.0493**	0.0322***	0.0198*	0.1112***	0.1767***	0.0123
	(0.019)	(0.011)	(0.011)	(0.022)	(0.028)	(0.010)
Board male ratio	0.0105	0.2561***	0.2407***	0.0358	0.0761	0.2303***
	(0.062)	(0.028)	(0.029)	(0.054)	(0.054)	(0.029)
Board Ind.	0.0017***	0.0009***	0.0010***	0.0013***	0.0005	0.0011***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Audit Ind.	0.0002	-0.0010***	-0.0009***	0.0001	-0.0004	-0.0009***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.6033***	-0.1146*	-0.2273**	-0.0715	-0.0429	-0.1473
	(0.179)	(0.068)	(0.090)	(0.156)	(0.157)	(0.090)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,332	73,968	71,927	12,373	14,619	69,681
Adjusted R-squared	0.116	0.234	0.244	0.159	0.200	0.257

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Uncertainty Avoidance		Long-term orientation		Indulgence	
	Low	High	Low	High	Low	High
CEO reputation	0.0199***	0.0090	0.0149***	0.0227***	0.0109**	0.0223***
	(0.004)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Firm size	0.0261***	0.0191***	0.0345***	0.0154***	0.0195***	0.0274***
	(0.002)	(0.005)	(0.002)	(0.003)	(0.004)	(0.002)
Growth opportunities	0.0091***	0.0048	-0.0007	0.0288***	0.0204***	0.0054*
	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)	(0.003)
Firm performance	0.1139***	0.2456***	0.1111***	0.0725*	0.1190***	0.1150***
	(0.023)	(0.071)	(0.026)	(0.040)	(0.046)	(0.024)
Leverage	0.0720***	-0.0956**	0.1436***	-0.2347***	-0.1132***	0.0859***
	(0.017)	(0.045)	(0.020)	(0.027)	(0.034)	(0.018)
CEO age	-0.0230***	-0.0116	-0.0182***	-0.0227***	-0.0176**	-0.0206***
	(0.006)	(0.009)	(0.007)	(0.007)	(0.007)	(0.007)

CEO gender	0.0307**	-0.0267	0.0367**	-0.0269	-0.0102	0.0276
	(0.016)	(0.041)	(0.017)	(0.027)	(0.025)	(0.017)
CEO social networking	0.0017	0.0201***	-0.0026	0.0138***	0.0117***	0.0001
	(0.002)	(0.005)	(0.002)	(0.004)	(0.004)	(0.002)
Litigation intensity	0.0216**	0.1187***	0.0193	0.0558***	0.0945***	0.0179
	(0.011)	(0.024)	(0.012)	(0.016)	(0.017)	(0.011)
Board male ratio	0.1986***	0.1799***	0.2542***	0.0984**	0.0165	0.2365***
	(0.029)	(0.053)	(0.034)	(0.040)	(0.047)	(0.031)
Board Ind.	0.0010***	0.0008**	0.0009***	0.0006**	0.0010***	0.0011***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Audit Ind.	-0.0009***	-0.0005*	-0.0010***	-0.0004**	-0.0001	-0.0012***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.0433	-0.2379	-0.0956	-0.1543*	0.0496	-0.2213**
	(0.069)	(0.172)	(0.112)	(0.094)	(0.126)	(0.092)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	74,539	9,761	57,141	27,159	15,511	68,789
Adjusted R-squared	0.242	0.223	0.269	0.155	0.155	0.236

Table 6 provides the results of the OLS regressions in which we examine how national culture moderates the relationship between CEO reputation and corporate financial fraud. The dependent variable is corporate financial fraud, which uses F-score as a proxy, a function of accruals, change in receivables, change in inventory, percentage of soft assets, change in cash sales, change in return on assets, and issuance of debt or equity during the last year. CEO reputation is the natural log of 1 plus the total number of external directorships held by a CEO during the year. Firm size is the natural log of the total book value of assets. Growth opportunities use the market value divided by book value as a measurement. Firm performance is EBIT divided by total assets. Leverage is total debt divided by total assets. CEO age is the natural log of CEO age. CEO gender is a dummy variable that equals 1 if the CEO is a male, and 0 otherwise. CEO networking is the natural logarithm of the number of overlaps through employment, education, and other social activities in the BoardEx. Litigation intensity is equal to 1 if the firm operates in a litigious industry, and 0 otherwise. A litigious industry is defined as being one of the following SIC industries: 2832-37, 3569-78, 3599-675, 5199-62, and 7370-80. The Board male ratio is the proportion of male directors at the Annual Report Date selected. Board Independence is the percentage of independent directors on the board. Audit Committee Independence is the percentage of independent directors on the audit committee. We split the sample into different subsamples based on cultural dimensions and estimate Eq. (1) using the subgroups. In order, from model (1) to model (12) are based on individualism, power distance, masculinity, uncertainty avoidance, long-term orientation and indulgence respectively. Low or high culture dimensions are based on whether their scores are lower or higher than the median values of culture scores across the sample. Specifically, regressions in the model (1), (3), (5), (7), (9) and (11) are estimated for low score (below median) subsamples and in models (2), (4), (6), (8), (10) and (12) are for high score (above median) subsample. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Table A 3 Variable definition.**

Table 7 PSM results: CEO ability, CEO reputation and corporate financial fraud

Panel A: CEO ability and corporate financial fraud

Fraud	Coefficient	AI robust	z	p>|z|	95%conf.	interval
ATET		Std.err.				
CEO ability	-.0697443	.009864	-7.07	0.000	-.0890774	-.0504112

Panel B: CEO reputation and corporate financial fraud

Fraud	Coefficient	AI robust	z	p>|z|	95%conf.	interval
ATET		Std.err.				
CEO reputation	.0897428	.0064394	13.94	0.000	.0771219	.1023638

Table 8 Summary statistics for CEO ability, CEO reputation and corporate financial fraud: before and after entropy balancing

Panel A: Summary statistics for the treatment and the control groups before entropy balancing: CEO ability and corporate financial fraud

Variables	Treatment			Control		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Firm size	6.807	4.741	-0.167	6.562	6.326	-0.071
Growth opportunities	0.720	1.225	1.414	0.593	1.751	3.987
Firm performance	0.038	0.035	-3.544	-0.073	0.069	-2.569
Leverage	0.190	0.036	1.137	0.224	0.052	1.089
CEO age	3.970	0.512	-5.169	4.037	0.296	-6.845
CEO gender	0.967	0.032	-5.256	0.964	0.034	-5.002
CEO social networking	5.976	2.705	-0.657	6.089	2.249	-0.583
Litigation intensity	0.276	0.200	1.000	0.345	0.226	0.651
Board male ratio	0.879	0.015	-0.835	0.880	0.014	-0.800
Board Independence	66.800	388.700	-1.191	69.73	279.100	-1.349
Audit Committee Independence	90.940	308.100	-3.179	92.38	212.700	-3.751

Panel B: Summary statistics for the treatment and the control groups after entropy balancing: CEO ability and corporate financial fraud

Variables	Treatment			Control		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Firm size	6.807	4.741	-0.167	6.807	4.741	-0.164
Growth opportunities	0.720	1.225	1.414	0.720	1.226	1.896
Firm performance	0.038	0.035	-3.544	0.038	0.035	-3.998
Leverage	0.190	0.036	1.137	0.190	0.036	1.164
CEO age	3.970	0.512	-5.169	3.970	0.512	-5.177
CEO gender	0.967	0.032	-5.256	0.967	0.032	-5.256
CEO social networking	5.976	2.705	-0.657	5.976	2.705	-2.256
Litigation intensity	0.276	0.200	1.000	0.276	0.200	1.000
Board male ratio	0.879	0.015	-0.835	0.879	0.015	-0.854
Board Independence	66.800	388.700	-1.191	66.800	388.700	-1.245
Audit Committee Independence	90.940	308.100	-3.179	90.940	308.100	-3.180

Table 8 Panel A and Panel B show the descriptive statistics for the variables before and after entropy balancing. Before entropy balancing, the means and the variances of the variables are different between the treatment and the control groups. After entropy balancing, however, the means and the variances of the variances are very close, suggesting that entropy balancing is successful.

Panel C: Summary statistics for the treatment and the control groups before entropy balancing: CEO reputation and corporate financial fraud

Variables	Treatment			Control		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Firm size	7.152	5.043	-0.349	6.172	4.649	0.073
Growth opportunities	0.672	1.261	2.017	0.718	1.472	2.549
Firm performance	0.018	0.039	-3.488	0.005	0.053	-2.915
Leverage	0.210	0.040	1.096	0.181	0.039	1.275
CEO age	4.034	0.309	-6.723	3.915	0.678	-4.407
CEO gender	0.964	0.035	-4.956	0.971	0.028	-5.598
CEO social networking	6.217	2.317	0.367	5.692	2.851	-1.666
Litigation intensity	0.295	0.208	0.899	0.288	0.205	0.936
Board male ratio	0.873	0.015	-0.790	0.888	0.015	-0.895
Board Independence	67.880	386.500	-1.201	66.900	333.700	-1.318
Audit Committee Independence	91.280	306.300	-3.229	91.260	258.200	-3.397

Panel D: Summary statistics for the treatment and the control groups after entropy balancing

Variables	Treatment			Control		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Firm size	7.152	5.043	-0.349	7.152	5.043	-0.048
Growth opportunities	0.672	1.261	2.017	0.672	1.261	1.994
Firm performance	0.018	0.039	-3.488	0.018	0.039	-3.306
Leverage	0.210	0.040	1.096	0.210	0.040	1.053
CEO age	4.034	0.309	-6.723	4.034	0.309	-6.684
CEO gender	0.964	0.035	-4.956	0.964	0.035	-4.956
CEO social networking	6.217	2.317	0.367	6.217	2.318	0.300
Litigation intensity	0.295	0.208	0.899	0.295	0.208	0.899
Board male ratio	0.873	0.015	-0.790	0.873	0.015	-0.708
Board Independence	67.880	386.500	-1.201	67.880	386.500	-1.228
Audit Committee Independence	91.280	306.300	-3.229	91.280	306.300	-3.132

Panel C and panel D show the descriptive statistics for the variables before and after entropy balancing. Before entropy balancing, the means and the variances of the variables are different between the treatment and the control groups. After entropy balancing, however, the means and the variances of the variances are very close, suggesting that entropy balancing is successful.

Table 9 Entropy balancing technique results: The effects of CEO ability, CEO reputation on corporate financial fraud

Variables	Corporate financial fraud	
	Model (1)	Model (2)
	Entropy balancing	
CEO ability	-0.431***	
	(0.136)	
CEO reputation		0.0199***
		(0.00384)
Firm size	0.0325***	0.0247***
	(0.00471)	(0.00186)
Growth opportunities	-0.00320	0.00396
	(0.00656)	(0.00257)
Firm performance	0.360***	0.172***
	(0.125)	(0.0213)
Leverage	-0.0256	0.0694***
	(0.0397)	(0.0166)
CEO age	0.00916	-0.0242***
	(0.0150)	(0.00566)
CEO gender	0.0626	0.0228
	(0.0383)	(0.0151)
CEO networking	0.00682	0.00222
	(0.00479)	(0.00209)
Litigation intensity	0.0201	0.0421***
	(0.0325)	(0.00983)
Board male ratio	0.266***	0.226***
	(0.0661)	(0.0265)
Board Independence	0.00113**	0.000988***
	(0.000509)	(0.000187)
Audit Committee Independence	-0.000204	-0.000718***
	(0.000454)	(0.000181)
Constant	-0.660***	-0.193**
	(0.156)	(0.0807)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
Observations	72,672	84,300
R-squared	0.244	0.279

Table 9 presents entropy balancing results on the relationship between CEO ability, CEO reputation and corporate financial fraud. The dependent variable is the likelihood of corporate financial fraud, which uses the F-score as the proxy, a function of accruals, change in receivables, change in inventory, percentage of soft assets, change in cash sales, change in return on assets, and issuance of debt or equity during the last year. CEO ability takes 1 if the past three-year industry-adjusted ROA is positive, and 0 otherwise. CEO reputation takes 1 when the total number of external directorships held by a CEO during the year is more than one, and 0 otherwise. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Table A 3 Variable definition.**

Table 10 Treatment effect: CEO ability, CEO reputation and corporate financial fraud
Panel A: Treatment effect: selection equation

Variables	(1)	(2)
	CEO ability dummy	CEO reputation dummy
CEO tenure	0.0755***	
	(0.00612)	
Net Cash flow	0.0904***	
	(0.00230)	
Firm size		0.137***
		(0.00209)
CEO outsider		0.0919***
		(0.00960)
Constant	-0.111***	-0.727***
	(0.0154)	(0.0157)
Observations	72,705	84,348

Panel B: Treatment effect: test models

Variables	(1)	(2)
	Corporate financial fraud	
CEO ability dummy	-0.846***	
	(0.0340)	
CEO reputation dummy		0.337***
		(0.0181)
Growth opportunities	0.00817***	-0.000950
	(0.00286)	(0.00259)
Firm performance	0.312***	0.266***
	(0.0246)	(0.0201)
Firm size	0.0497***	
	(0.00225)	
Leverage	-0.173***	-0.0637***
	(0.0171)	(0.0155)
Litigation intensity	0.224***	0.217***
	(0.00738)	(0.00702)
CEO age	0.0201***	0.0195***
	(0.00587)	(0.00516)
CEO gender	0.0692***	0.0759***
	(0.0169)	(0.0160)
CEO social networking	0.0266***	0.0274***
	(0.00221)	(0.00200)
Board male ratio	0.300***	0.301***
	(0.0247)	(0.0232)
Board Independence	0.00544***	0.00558***
	(0.000190)	(0.000177)
Audit Committee Independence	0.00127***	0.00113***
	(0.000201)	(0.000188)
athrho	0.577***	-0.191***
	(0.0312)	(0.0141)
lnsigma	-0.147***	-0.199***
	(0.00969)	(0.00592)
Constant	0.116***	-0.322***
	(0.0418)	(0.0361)
Observations	72,705	84,348
Wald $\chi2$	340.82	184.03

Table 10 Panel B presents treatment effect results on the relationship between CEO ability, CEO reputation and corporate financial fraud. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Table A 3 Variable definition.**

Table 11 IV-2SLS results for the relationship between CEO ability, CEO reputation and corporate financial fraud

Variables	(1)	(2)
	Corporate financial fraud	
CEO ability	-0.155***	
	(0.0504)	
CEO reputation		0.0433***
		(0.0164)
Firm size	0.161***	
	(0.00971)	
Growth opportunities	0.0593***	0.0473***
	(0.00964)	(0.00841)
Firm performance	0.231***	0.377***
	(0.0541)	(0.0534)
Leverage	-0.225***	-0.0964
	(0.0729)	(0.0852)
CEO age	-0.228***	-0.192***
	(0.0554)	(0.0335)
CEO gender	0.00562	0.0196
	(0.0474)	(0.0456)
CEO social networking	-0.00556	-0.000262
	(0.00340)	(0.00274)
Board male ratio	0.403***	0.204***
	(0.0316)	(0.0516)
Board Independence	-0.00139***	-0.000682*
	(0.000282)	(0.000383)
Audit Committee Independence	0.000625	0.000386
	(0.000481)	(0.000508)
Endogeneity test (P-value)	0.9764	0.0291
Hansen J (P-value)	0.2796	0.2149
Underidentification test F stat	5.315*	19.408***
Weak identification test (Stock-Yogo test)	19.93	22.30
Cragg-Donald Wald F statistic	16,000	1,777.353
Observations	71,629	83,195
R-squared	0.020	0.009
Number of firms	8,255	9,359

Table 11 presents IV-2SLS results on the relationship between CEO ability, CEO reputation and corporate financial fraud. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Table A 3 Variable definition.**

Table 12 Alternative dependent variable: M-score dummy variable

Variables	(1)	(2)
	M-score dummy variable	
CEO ability	-0.865***	
	(0.0814)	
CEO reputation		0.0387***
		(0.0138)
Firm size	-0.144***	-0.167***
	(0.00702)	(0.00598)
Growth opportunities	0.0717***	0.0940***
	(0.00932)	(0.00823)
Firm performance	0.507***	0.0564
	(0.0891)	(0.0572)
Leverage	-0.238***	-0.231***
	(0.0647)	(0.0548)
CEO age	-0.0513***	-0.0376***
	(0.0183)	(0.0140)
CEO gender	-0.111*	-0.0988*
	(0.0604)	(0.0523)
CEO social networking	-0.0334***	-0.0222***
	(0.00743)	(0.00621)
Litigation intensity	0.153***	0.154***
	(0.0386)	(0.0329)
Board male ratio	0.744***	0.835***
	(0.106)	(0.0911)
Board Independence	-0.00248***	-0.00246***
	(0.000821)	(0.000676)
Audit Committee Independence	0.000771	0.000819
	(0.000881)	(0.000728)
Constant	-0.130	0.628
	(0.541)	(0.438)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
Observations	59,393	76,633

Table 12 presents logit regression results on the relationship between CEO ability, CEO reputation and corporate financial fraud. We use an alternative dependent variable: The m-score dummy variable, which takes 1 when the M-score is greater than 2.22, and 0 otherwise. CEO ability, proxy using the past three-year industry-adjusted ROA. CEO reputation is the natural log of 1 plus the total number of external directorships held by a CEO during the year. Firm size is the natural log of the total book value of assets. Growth opportunities use the firm's market value divided by book value. Firm performance is EBIT divided by total assets. Leverage is total debt divided by total assets. CEO age is the natural log of CEO age. CEO gender is a dummy variable that equals 1 if the CEO is a male, and 0 otherwise. CEO networking is the natural logarithm of the number of overlaps through employment, education, and other social activities in the BoardEx. Litigation intensity is equal to 1 if the firm operates in a litigious industry, and 0 otherwise. A litigious industry is defined as being one of the following SIC industries: 2832-37, 3569-78, 3599-675, 5199-62, and 7370-80. The Board male ratio is the proportion of male directors at the Annual Report Date selected. Board Independence is the percentage of independent directors on the board. Audit Committee Independence is the percentage of independent directors on the audit committee. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Table A 3 Variable definition.**

Table 13 Pooled OLS regression results on the relationship between CEO ability, CEO reputation and corporate financial fraud: developed countries vs developing countries, financial vs non-financial firms

Variables	(1) Developing	(2) developed	(3) Developing	(4) Developed	(5) Nonfinancial	(6) Financial	(7) Nonfinancial	(8) Financial
CEO ability	-0.308**	-0.146***			-0.130***	0.394		
	(0.150)	(0.0320)			(0.0317)	(0.245)		
CEO reputation			0.00887	0.0185***			0.0199***	0.0173
			(0.00847)	(0.00409)			(0.00382)	(0.0142)
Firm size	0.0156**	0.0336***	0.00618	0.0275***	0.0238***	0.0805***	0.0182***	0.0728***
	(0.00632)	(0.00190)	(0.00645)	(0.00183)	(0.00186)	(0.00658)	(0.00179)	(0.00631)
Growth opportunities	0.0323***	0.00489	0.0404***	0.00765***	0.0106***	-0.0463***	0.0141***	-0.0489***
	(0.00935)	(0.00299)	(0.00990)	(0.00276)	(0.00293)	(0.0111)	(0.00271)	(0.0109)
Firm performance	0.0643	0.216***	-0.166*	0.126***	0.239***	-0.242	0.154***	-0.0291
	(0.109)	(0.0315)	(0.0972)	(0.0224)	(0.0313)	(0.223)	(0.0222)	(0.149)
Leverage	-0.302***	0.0600***	-0.254***	0.0614***	0.00861	0.481***	0.00912	0.470***
	(0.0514)	(0.0178)	(0.0458)	(0.0167)	(0.0175)	(0.0605)	(0.0163)	(0.0579)
CEO age	-0.0365	-0.0193***	-0.0371**	-0.0201***	-0.0192***	-0.0133	-0.0219***	6.87e-05
	(0.0225)	(0.00602)	(0.0162)	(0.00538)	(0.00605)	(0.0243)	(0.00535)	(0.0217)
CEO gender	0.0206	0.0138	0.0175	0.0157	0.0120	0.0480	0.0176	0.0251
	(0.0448)	(0.0161)	(0.0467)	(0.0153)	(0.0156)	(0.0575)	(0.0148)	(0.0565)
CEO social networking	-0.0107	0.00417*	-0.00439	0.00325	0.00490**	-0.00138	0.00421**	-0.00220
	(0.00653)	(0.00221)	(0.00612)	(0.00212)	(0.00213)	(0.00780)	(0.00205)	(0.00747)
Litigation intensity	0.0853**	0.0287***	0.125***	0.0298***	0.0270***	0.338***	0.0306***	0.316***
	(0.0373)	(0.0106)	(0.0346)	(0.0101)	(0.0103)	(0.0341)	(0.00971)	(0.0330)
Board male ratio	-0.0944	0.237***	-0.132	0.247***	0.185***	0.322***	0.182***	0.360***
	(0.0944)	(0.0280)	(0.0887)	(0.0267)	(0.0263)	(0.107)	(0.0252)	(0.101)
Board Independence	0.00191***	0.000983***	0.00124**	0.000945***	0.00101***	0.000914	0.000881***	0.00144*
	(0.000553)	(0.000207)	(0.000514)	(0.000192)	(0.000192)	(0.000934)	(0.000179)	(0.000858)
Audit Committee Independence	-9.08e-05	-0.000709***	-0.000385	-0.000783***	-0.000645***	-0.00299*	-0.000677***	-0.00329*
	(0.000486)	(0.000208)	(0.000446)	(0.000197)	(0.000191)	(0.00181)	(0.000181)	(0.00168)
Constant	0.835*	-0.155**	0.930**	-0.116*	-0.106	-0.173	-0.0813	-0.725**
	(0.472)	(0.0710)	(0.421)	(0.0664)	(0.0919)	(0.246)	(0.0840)	(0.321)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,900	68,772	4,971	79,329	61,844	10,828	72,090	12,210
Adjusted R-squared	0.182	0.260	0.164	0.247	0.166	0.095	0.153	0.095

Note: the samples in Columns (1) and (3) are from developing countries, and the samples in Columns (2) and (4) are from developed countries. Columns (5) and (7) are from the financial industry, while Columns (6) and (8) are from the non-financial industry. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Table A 3 Variable definition.**

Table 14 Pooled OLS regression results on the relationship between CEO ability, CEO reputation and corporate financial fraud: US firms vs non-US firms, US&UK vs non-US&UK

| Variables	(1) US	(2) Non-US	(3) US UK	(4) Non-US UK	(5) US	(6) Non-US	(7) US&UK	(8) Non-US&UK
CEO ability	-0.0886**	-0.2012***	-0.1558***	-0.1471***				
	(0.041)	(0.045)	(0.038)	(0.054)				
CEO reputation					0.0226***	0.0188***	0.0316***	0.0091*
					(0.006)	(0.005)	(0.006)	(0.005)
Firm size	0.0493***	0.0200***	0.0387***	0.0225***	0.0428***	0.0148***	0.0315***	0.0184***
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)
Growth opportunities	-0.0206***	0.0257***	-0.0098***	0.0231***	-0.0194***	0.0290***	-0.0077**	0.0261***
	(0.003)	(0.004)	(0.003)	(0.005)	(0.003)	(0.004)	(0.003)	(0.005)
Firm performance	0.2371***	0.1543***	0.2483***	0.1136**	0.1991***	0.0237	0.1682***	-0.0011
	(0.041)	(0.046)	(0.037)	(0.055)	(0.028)	(0.034)	(0.026)	(0.040)
Leverage	0.1496***	-0.1119***	0.0727***	-0.0147	0.1499***	-0.0950***	0.0753***	-0.0112
	(0.022)	(0.028)	(0.020)	(0.032)	(0.021)	(0.025)	(0.019)	(0.029)
CEO age	-0.1291***	-0.0123**	-0.1144***	-0.0124**	-0.1500***	-0.0137**	-0.1383***	-0.0131**
	(0.023)	(0.006)	(0.025)	(0.006)	(0.023)	(0.005)	(0.024)	(0.005)
CEO gender	0.0366*	0.0084	0.0171	0.0308	0.0455**	0.0012	0.0220	0.0270
	(0.020)	(0.024)	(0.020)	(0.024)	(0.019)	(0.022)	(0.019)	(0.022)
CEO social networking	-0.0070**	0.0086***	-0.0017	0.0060*	-0.0076***	0.0074**	-0.0020	0.0037
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Litigation intensity	-0.0085	0.0835***	-0.0169	0.1303***	-0.0099	0.0897***	-0.0159	0.1329***
	(0.013)	(0.016)	(0.013)	(0.017)	(0.012)	(0.015)	(0.012)	(0.016)
Board male ratio	0.2612***	0.0784**	0.2546***	0.0386	0.2732***	0.0850**	0.2652***	0.0461
	(0.040)	(0.036)	(0.037)	(0.039)	(0.039)	(0.034)	(0.036)	(0.036)
Board Independence	0.0015***	0.0003	0.0017***	0.0003	0.0013***	0.0004*	0.0016***	0.0003
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Audit Committee Independence	-0.0025***	-0.0002	-0.0019***	-0.0001	-0.0025***	-0.0004*	-0.0019***	-0.0002
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Constant	0.5266***	-0.0061	0.4412***	0.2209	0.7447***	-0.0675	0.5158***	0.0775
	(0.139)	(0.117)	(0.132)	(0.153)	(0.146)	(0.099)	(0.126)	(0.140)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38,954	33,718	46,901	25,771	43,837	40,463	53,043	31,257
Adjusted R-squared	0.280	0.165	0.241	0.182	0.271	0.152	0.232	0.165

Note: the samples in Columns (1) and (5) are from the United States, and the samples in Columns (2) and (6) are from non-US countries. Columns (3) and (7) are from the US and UK, and Columns (4) and (6) are from countries other than the US and UK. Columns (1) to (4) use CEO ability as the independent variable, and Columns (5) to (8) use CEO reputation as the independent variable. All regressions include industry, country, and year fixed effects. The robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions of each variable used in the study are presented in **Error! Reference source not found.**.

Figure 1 Diagnostics tests for the PSM results

(i) The balance and overlap tests for the PSM method for CEO ability and corporate fraud
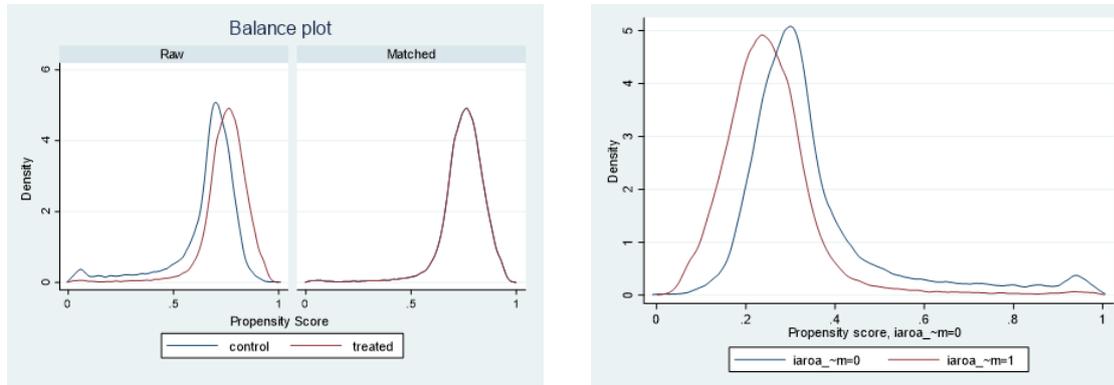
(ii) The balance and overlap tests for the PSM method for CEO reputation and corporate fraud
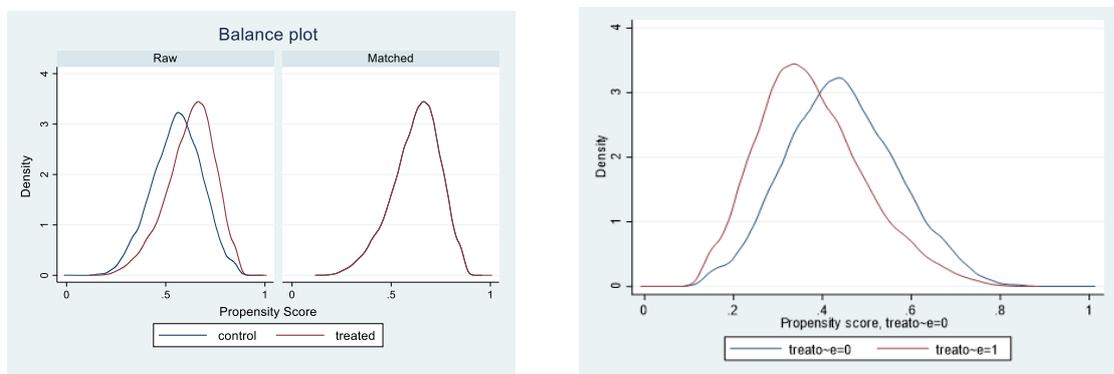
Note: (i) and (ii) provide the post estimation: balance and overlap tests for the PSM method for CEO ability, CEO reputation and corporate financial fraud, to valid the PSM results as reported in Table 11, using the advanced Stata options (i.e., nneighbor (5) caliper (0.5) pstolerance (0.00005)) (Abadie and Imbens, 2006; Rosenbaum and Rubin, 1983). The balance tests on the left-hand side show that the matching process provided good balance in the covariate distributions in the treated and control groups. The plots on the right-hand side reveal that the overlap tests are satisfactory. Overall, the two diagnostics tests (i.e., overlap and balancing tests) related to these figures suggest that our PSM results are valid because the treated observations are on support and there is no difference between the control and treated groups as per the covariates.