

# Professional Accountancy Organizations and Stock Market Development

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**Abstract** This study investigates the relationship between the ethical, educational, and disciplinary development of professional accountancy organizations (PAOs) in a given country and the development of that country's stock market. Using a comprehensive measure based on the responses of the major PAOs in 36 countries to a questionnaire designed by the International Federation of Accountants to assess the development of PAOs internationally, we find a significantly positive association between the development of PAOs and stock market development. In addition, we find the positive association between the development of PAOs and stock market development to be more pronounced in countries with higher levels of investor protection, a stronger public enforcement environment, or lower levels of corruption, suggesting the importance of complementary institutions in the relationship between PAOs and stock market development. We also find that better-developed PAOs are associated with better-quality financial reporting. Finally,

our result also shows that relative to the investigation and discipline mechanism and educational requirements imposed by PAOs, the ethical development of a country's professional accountants appears to have the strongest positive association with a country's stock market development.

**Keywords** Ethics · Education · Oversight · Financial reporting quality · Economic development

## Introduction

Professional accountants can be defined as “a disciplined group of individuals who adhere to ethical standards. This group positions itself as processing special knowledge and skills in a widely recognized body of learning derived from research, education, and training at a high level, and is recognized by the public as such.”<sup>1</sup> Professional accountancy organizations (PAOs) are membership bodies primarily comprising professional accountants and auditors, and they serve as the major governing bodies of accounting practitioners in a country. Key responsibilities of PAOs are to provide a framework for the self-regulation of the accounting profession, to administer the training of members, and to provide examinations for students or future members. Through comprehensive ethical and educational requirements and investigation and disciplining mechanisms adopted for accounting practitioners, PAOs are perceived to play important roles in fostering the development of the accounting profession, building market

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<sup>1</sup> This definition of the profession was provided by the Australian Council of Professions in 1995 (also see <http://www.psc.gov.au/what-is-a-profession>).

participants' trust in the accounting profession worldwide, and supporting economic development.<sup>2</sup>

Given the importance of PAOs in the global economy, the major objective of this study is to investigate PAOs' roles in countries around the world by examining the relation between the development of PAOs in terms of their ethical and educational requirements, the level of oversight, and the stock market development of individual countries. As many of a country's institutions are likely to be intertwined, we also investigate whether the relationship between PAO development and stock market development varies with other country-level institutional characteristics such as investor protection and legal protection. In addition, given that one of the main institutions affecting financial reporting practices around the world is the quality of a country's accounting profession (Ball et al. 2003; Michas 2011), we also consider the association between the development of PAOs and firms' financial reporting qualities to identify the possible channels through which the development of PAOs in a country could be associated with greater stock market development in that country. Finally, in our study, we test the relative importance of each of the three dimensions of PAOs development (i.e., ethical and educational requirement and disciplinary mechanism) in the association between development of PAOs and stock market development.

Understanding the institutions that are associated with stock market development is important because a well-developed and well-functioning stock market is crucial to economic growth (Levine 1997; Bekaert et al. 2005). There is a rich body of literature supporting the important role of strong institutions in ensuring useful decision-making information and ultimately economic growth (see, for example, Holthausen 2009 for a review). However, to the best of our knowledge, except for Michas (2011), who documents a positive association between the development of the audit profession and financial reporting quality in emerging countries, no research to date has directly investigated whether and to what extent the PAOs in a given country (as comprising an important institution shaping financial reporting practices) influence that country's economic development in general and stock market development in particular.

<sup>2</sup> For example, the UNCTAD-ISAR (The Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting of the United Nations Conference on Trade and Development) stated, "Accounting plays an essential role in economic development. High-quality corporate reporting is key to improving transparency, facilitating the mobilization of domestic and international investment, creating sound investment environments and fostering investor confidence, thus promoting financial stability." See <http://www.accaglobal.com/content/dam/acca/global/PDF-technical/global-economy/pol-tp-raed.pdf>.

To answer our research questions, we first construct a comprehensive measure of the development of PAOs based on the responses of the major PAOs<sup>3</sup> in 36 countries around the world to a questionnaire designed by the International Federation of Accountants (IFAC)—the most representative global organization for the accountancy profession, to assess the quality of PAOs internationally. Completion of the IFAC questionnaire is not voluntary; it is included in the IFAC's member obligations. Specifically, the development of PAOs in each country is assessed based on three major criteria: (1) ethical and (2) educational requirements and (3) the investigation and discipline (or oversight) mechanism imposed by the country's major PAOs on their members. Consistent with the notion that PAOs play an important role in a country's economic/stock market development, after controlling for other country-level institutional factors that studies have documented to be associated with stock market development, we find a significant and positive association between the development of PAOs and stock market development.<sup>4</sup>

In additional analyses, we repeat our tests on the three major criteria of PAOs' development. In line with the IFAC's view that stringent ethical requirements, high-level educational requirements, and good investigation and discipline mechanisms are important in establishing an accountable accounting profession, our results show a significant and positive association between each of the three dimensions of PAOs development and a country's stock market development. Our findings are thus consistent with the framework of Black (2001), which suggests that the two core conditions for a strong stock market are a sophisticated accounting profession characterized by skilled and experienced accountants and laws that make accountants liable to investors for endorsing false or misleading financial statements. More importantly, our results show that relative to the investigation and discipline mechanism and educational requirements, the ethical development of a country's professional accountants appears to have the strongest positive association with that country's stock market development. This surprising finding provides strong support for the notion that the ethics of the preparers of financial information play a more critical

<sup>3</sup> See Appendix 1 for a comprehensive list of the major PAOs of each country in our sample.

<sup>4</sup> For each country, we create two overall measures of PAOs (i.e., one based on the answers to six general questions, *PAO\_general*, and the other based on the answers to 25 more specific questions, *PAO\_specific*) designed to assess the level of development of each PAO member of IFAC. In addition, we create three additional PAO measures for the three major dimensions of each PAO: (1) requirements for ethics (*PAO\_Ethics*), (2) requirements for education (*PAO\_Education*), and (3) level of investigation and discipline (*PAO\_Oversight*). See Appendix 2 for further details on the definitions of these measures.

role in firms' financial reporting outcomes and, ultimately, in economic development around the world.<sup>5</sup>

To enhance confidence in our findings, we carry out additional robustness tests. Specifically, we validate our finding of a positive relationship between the development of PAOs in a country measured by an input-based measure based on information provided by PAOs (i.e., through IFAC survey) and that country's stock market development using an alternative output-based measure based on information related to auditors' characteristics in each country. Given that a greater market share for the Big 4 auditing firms indicates the perceived importance of professional accountants to both firms and investors in a country, we use the market share of Big 4 auditors in a given country-year as our alternative PAO development measure. We obtain similar results and conclusions with this measure, which suggests that the previously documented positive link between PAO development and stock market development is not sensitive to the choice of measure or limited to our survey-based measures.

We further propose and directly test the possible channels through which better-developed PAOs could be linked to stock market development. Our tests of the possible channels underlying the association between PAOs and stock market development are motivated by IFAC's mission to promote best practices in accounting professions around the world. More specifically, we examine whether and how the development of PAOs contributes to better financial reporting practices.<sup>6</sup> Consistent with the argument that a well-developed PAO promotes the production of good-quality information, which in turn facilitates stock market development, we find negative associations between the development of PAOs in a country and the level of earnings management/earnings smoothing and likelihood of financial restatements and a positive association with the informativeness of firms' annual earnings announcements.

The international financial reporting literature concludes that many country-level institutional variables can have

<sup>5</sup> Analogous to the conclusion of our study, Joseph Stalin's famous statement in 1923, "It doesn't matter how the votes are cast, but how they're counted," suggests that the ethics of political practitioners play an important role in the development of a country's political system.

<sup>6</sup> IFAC states, "When professional accountancy organizations (PAOs) function properly, they have the power to support the production of high-quality information, contributing to public and private sector, economic growth, and the effectiveness of international aid." Other studies show that higher quality financial reporting and a better information environment contribute to a lower cost of capital, higher liquidity, more efficient corporate investment, and better-functioning capital markets, ultimately leading to a better-developed stock market (La Porta et al. 1998; Bushman and Smith 2001; Healy and Palepu 2001; Frost et al. 2006; Hail and Leuz 2006; Hope and Thomas 2008; Biddle et al. 2009).

significant movement or arguably inseparable interdependency (Isidro et al. 2016). This argument suggests that other complementary institutional variables may also play roles in the relationship between PAOs and stock market development. Further supporting this view, a key finding from a recent IFAC research report suggests that the role played by professional accountants in fighting corruption is amplified in countries with higher levels of governance.<sup>7</sup> This evidence suggests that it is important to take other country-level institutional attributes into consideration when examining the effect of a single underlying factor, such as the development of PAOs in explaining cross-country variations in economic or stock market development.

Consistent with the research on whether one country-level institutional characteristic is a complement to or a substitute for other country-level institutional attributes (e.g., Durnev and Kim 2005; Fan and Wong 2002; Choi and Wong 2007; Francis et al. 2013), our cross-sectional tests suggest that the role PAOs play in a country's stock market development varies with other institutional factors that influence accounting practitioners' incentives in a given country (Ball et al. 2000, 2003). More specifically, we find that the positive association between the development of PAOs and stock market development is more pronounced in countries with higher levels of investor protection, stronger public enforcement environments, or lower levels of corruption. Overall, our findings support the argument that although the development of PAOs in countries around the world appears to have a positive association with the stock market development in their countries, such an association is less pronounced in countries without the support of a strong institutional infrastructure that influences accounting practitioners' incentives.

This study advances the literature in several ways. First, it contributes to the literature on the development of securities markets. A rich body of literature suggests that country-level institutional characteristics such as accounting standards (Ball et al. 2003), investor protection (La Porta et al. 1997, 1998, 2000; Levine 2002), national security laws (La Porta et al. 2006), enforcement strength (Jackson and Roe 2009), and disclosure requirements (Black 2001; Frost et al. 2006) can exert positive effects on a country's financial reporting outcomes, thus contributing to the development of that country's stock market. Our study contributes to that literature by identifying a previously undocumented country-level institutional factor with the potential to affect a country's stock market development: the development of PAOs in a country.

<sup>7</sup> <https://www.ifac.org/about-ifac/accountancy-profession-playing-positive-role-fighting-corruption>.

Similar to many prior archival studies, in examining the association between the development of PAOs and stock market development, we also acknowledge the fact that the simultaneous and endogenous nature of our data would limit our ability to draw a causal inference. Although in additional test, we attempt to identify changes in the development of PAOs in order to examine subsequent changes in stock market development, our test does not pass the test of causal inference. While drawing directional inference is difficult, because the development of PAOs could either serve as an ex-ante institutional attribute for facilitating better economic development or represent an ex-post-outcome of better-developed stock market, to the extent that there is a significant and positive relation between the development of PAOs and stock market development, we believe that our evidence speaks to the importance (in the former case) or perceived importance (in the latter case) of having a well-developed accounting profession in a country.

Second, our findings have implications for international studies of financial reporting quality. This strand of the literature establishes that financial reporting quality is the product of a multifaceted system comprising accounting standards, the enforcement of laws and regulations, and market participants' demand for information (see, for example, Ball et al. 2000; Fan and Wong 2002). Throughout the world, accounting practitioners such as professional accountants in businesses and public accountants in auditing firms are believed to play key roles in facilitating the development of good financial reporting practices and, ultimately, in the economic and stock market development of the countries in which they practice.<sup>8</sup> In this study, we recognize the importance of developing comprehensive ethical guidelines, stringent educational requirements, and professional oversight mechanisms to ensure the quality of financial information in a country and to explain international variations in financial reporting practices across countries.

Finally, our research extends the literature that analyzes the relation between accounting practitioner-related institutions and financial reporting outcomes (e.g., Ball et al. 2003; Michas 2011). For example, Michas (2011) investigates the cross-country differences in audit profession developments and studies the characteristics and effectiveness of audit institutions in emerging countries. He finds that audit quality is higher in countries with more developed audit professions. More specifically, he shows that a better-developed audit profession is positively

<sup>8</sup> In this study, we do not specifically differentiate between accountants and auditors because the ultimate natures of their roles in financial markets are similar—to provide credible and useful financial information to both internal and external users of financial reporting.

associated with client firms' accounting conservatism and negatively associated with their abnormal accruals in 15 emerging markets. Our study extends the work of Michas (2011) by examining the effects of the cross-country differences in PAOs on the development of ethical, educational, and disciplinary dimensions across 36 countries around the world and their relationships with financial reporting outcomes and stock market development.

The remainder of the paper proceeds as follows. Second section summarizes the related literature. Third section develops the main testable hypotheses. Fourth section describes the data and sample and presents the empirical models. Fifth section reports the univariate and multivariate results. Sixth section discusses additional tests. Seventh section concludes the paper.

## Related Literature

Our study draws primarily on two strands of the literature, summarized as follows.

### Literature on Factors Affecting Stock Market Development

The law and finance literature begins with La Porta et al. (1997, 1998, 2000) generally argues that legal rules protecting investors' property from expropriation constitute a foundation for financial contracting and affect the overall development of securities markets. This body of literature recognizes differences in the legal rules and law enforcement environments of countries governed by common law and civil law. Later studies in this area focus on specific institutional aspects of laws, regulations, and enforcement actions and their associations with measures of stock market consequence. For example, Bhattacharya and Daouk (2002) show that the first disciplinary measure resulting from insider trading laws in a given country (rather than the introduction of those laws) affects the cost of equity that firms face in a country. Frost et al. (2006) demonstrate that the disclosure rules and level of enforcement established by stock exchanges are positively associated with stock market development. La Porta et al. (2006) further examine the security laws governing new equity issuance and differentiate the legal rules facilitating private enforcement from those representing public enforcement. They find that the former exerts a stronger effect on stock markets.

Motivated by the law and finance literature, we examine whether the development of another institution—PAOs (more specifically, the development of the ethical and educational requirements and oversight mechanisms of the PAOs)—is positively associated with a country's stock



market development through the promotion of good financial reporting practices.

### International Studies on Financial Reporting Quality

Wide variations in the quality of financial reporting around the world are reported in the international literature. The literature suggests that the financial reporting outcomes in a given country are affected by various economic and political factors that influence the incentives of both managers and auditors (Ball et al. 2003). For instance, Ball et al. (2000) show that common law countries feature timelier and more conservative accounting numbers than do code law countries. Fan and Wong (2002) and Ball et al. (2003) focus on East Asian countries and find that in addition to accounting standards, the incentives of contracting parties are important determining factors in accounting quality. Leuz et al. (2003) document lower levels of earnings management in countries with better investor protection. DeFond et al. (2007) find that investors perceive firms' annual earnings announcements as more informative in countries in which insider trading laws are more stringently enforced.

A growing body of literature focuses on cross-country differences in the economic consequences of financial disclosure. Studies in this area generally find that better financial reporting quality is associated with capital market benefits across countries (Daske et al. 2008; Li 2010; Lang et al. 2012). However, studies also show that the well-documented capital market benefits associated with better financial reporting practices vary with country-level institutional characteristics. For example, Lang et al. (2012) find that the positive relation between corporate transparency measured by various proxies (such as earnings quality and the adoption of better accounting standards) and stock market liquidity is more pronounced in countries with poor investor protection. Cao et al. (2017) extend the focus of the international literature from mandatory financial disclosure to voluntary management earnings forecasts and show that the positive effect of management forecasts on firms' cost of equity capital depends on country-level institutional factors including investor protection, information dissemination, and disclosure requirements. In addition to financial reporting practices, the research has more recently considered non-financial disclosure. For example, Dhaliwal et al. (2012) examine the relationship between voluntary corporate social responsibility (CSR) disclosure and analysts' forecast accuracy. They find a positive relationship between them that is stronger for firms in countries with more opaque financial disclosure.

Although studies emphasize the importance of country-level institutional attributes in the cross-country variations

in firms' reporting practices and, ultimately, in the effect associated with firms' reporting practices, to the best of our knowledge, no study directly examines the possible role that the PAOs in a country play through their effort to strengthen the development of the accounting profession and also on economic development. We expand the literature by seeking to answer this question.

### Hypothesis Development

The development of the accounting profession is one of the main factors affecting a country's financial reporting outcomes. The nature of the accounting profession, however, has undergone substantial changes (Mellahi and Wood 2002). In addition to recording, classifying, summarizing, and interpreting firms' financial information, as AICPA emphasizes,<sup>9</sup> professional accountants now play a more comprehensive role in society. Internally, for example, competent professional accountants are arguably among companies' most important assets. Their expertise and understanding of firms and the business environment in which the firms operate afford professional accountants with oversight of firms' financial reporting quality and thus the ability to provide and communicate credible financial information. Externally, public accountants such as auditors not only provide investors with independent assurance of client firms' financial reporting quality but also play a significant role in building social trust (Rezaee 2004; Ardelean 2013).<sup>10</sup>

The existence of well-functioning and effective PAOs is an important mechanism in promoting and facilitating the development of a country's accounting profession in countries around the world. According to IFAC, PAOs influence such development through at least three major channels: strong ethical standards for professional conducts, stringent and high-level educational requirements, and the implementation of an effective investigation and discipline mechanism on their members.

High professional ethics standards are as important as high-quality accounting and auditing standards. The ethical requirements and specific guidelines governing accounting practitioners are usually set by the major PAOs in each

<sup>9</sup> For example, the American Institute of Certified Public Accountants (AICPA) defines financial accounting as "the art of recording, classifying and summarizing in a significant manner and in terms of money, transactions and events which are, in part at least, of a financial character, and interpreting the results thereof." This definition of financial accounting was formulated in 1941 by the AICPA Committee on Accounting Procedures.

<sup>10</sup> See also "The accountancy profession's role in creating public value" by ACCA (<http://www.accaglobal.com/content/dam/acca/global/pdf/public-value-report.pdf>).

country. Those requirements/guidelines are particularly important when accounting practitioners face ethical dilemmas or find themselves under pressure to act unethically. For example, accountants within businesses may face capital market pressure to choose alternative accounting methods that meet earnings targets but mislead investors about their firms' actual financial conditions. In the absence of clearly defined and well-communicated ethical standards, accountants may fail to uphold objective principles and act with integrity; instead, they implement accounting and auditing standards in self-interested ways, thus exerting negative effects on financial reporting quality. Findings from prior studies support the important role that accounting practitioners play in the quality of financial information, even in countries with high-quality accounting standards (e.g., Ball et al. 2003; Daske et al. 2013).

In addition, ethical standards can exert social pressure on accounting practitioners to behave professionally and induce feelings of guilt if they behave unprofessionally. As a result, accountants who follow clear ethical guidelines are less prone to succumb to pressure to manipulate a firm's financial reporting. Well-functioning PAOs promote strong professional and ethical standards through the adoption and implementation of international ethical standards and best practices. For example, in the USA, AICPA assumes responsibility for enacting and enforcing the AICPA Code of Professional Conduct and promotes awareness of ethical principles among accountants and the public on an ongoing basis.

Second, comprehensive educational requirements and continuing professional development are important because an accounting system that measures economic performance involves estimations and judgments (Dechow et al. 2010). Better-educated and well-trained accountants arguably have not only a better understanding of the nature of transactions and business conditions, but also a more solid grounding in and more current knowledge of accounting rules and their application. They are therefore more likely to make correct estimations and judgments and to apply standards appropriately, both of which are indispensable attributes when preparing high-quality financial reports.<sup>11</sup> PAOs presumably play a critical role in developing competent accountancy professionals through education, certification, and continuing professional development programs. For example, the Association of Chartered Certified Accountants (ACCA), a major PAO in the UK, annually reviews and updates its educational requirements by obtaining feedback from regulators, accountants, and

<sup>11</sup> Consistent with our argument, Demerjian et al. (2013) show that managers who are more knowledgeable about their business and their operating environment tend to make better judgments and estimates, and they thus have positive effects on firms' financial reporting quality.

companies to ensure a better-developed accounting profession. Better-trained and well-educated accounting professionals are also more likely to be perceived as having a higher career, reputational, and social status (Hanushek and Kimko 2000; Milbourn 2003). Hence, the opportunity costs of wrongdoing, whether intentional or unintentional, are higher for such accountants.<sup>12</sup>

Finally, strong and effective PAOs further ensure financial reporting quality by reviewing, investigating, and disciplining professional accountants. A stringent investigative and disciplinary mechanism increases the probability of error detection and imposes appropriate punishments for unprofessional and opportunistic behavior, thereby deterring accountants from committing errors.<sup>13</sup> For example, in 2010, AICPA took disciplinary action in 430 cases involving violations of professional conduct. About one fifth of those cases (i.e., 93 cases) resulted in membership suspension, and in about one third (i.e., 134 cases) the firms involved were subjected to corrective actions.

While the foregoing discussions tend to support a causal link between the development of PAOs and stock market development, and suggest that accounting practitioners in countries with well-developed PAOs are more likely to have better financial reporting practices than those in countries without and, ultimately, contribute to stock market development, a reverse link is also possible. For example, it is possible that in countries with better stock market and economic development, regulators, investors and other market participants not only are more likely but also are more able to dedicate efforts and resources in developing the quality of accounting practitioners, which in turn contributes to better-developed PAOs in countries with better economic development. Because the simultaneous and endogenous nature of the development of PAOs in a country and the stock market development in that country hampers our ability in drawing a clear causal inference, in our study, we formally state our hypotheses in a non-directional form as follows.

**H1:** The development of a country's PAOs is positively associated with the development of its stock market.

**H2:** The development of a country's PAOs is positively associated with the financial reporting quality of the firms operating in that country.

<sup>12</sup> These costs include the risk of losing higher compensation and jeopardizing career development, individual reputation, and social status.

<sup>13</sup> In line with this view, several studies report a higher level of auditor litigation risk to be positively associated with better audit quality (Khurana and Raman 2004; Venkataraman et al. 2008).

## Data, Sample, and Research Design

Given our interest in examining the relationship between PAOs and stock market development at the country level, we test the foregoing hypotheses by constructing a country-year sample. More specifically, to test H1, we regress the stock market development of a country-year on the measures of PAOs in the same country while controlling for other major country-level institutional variables well-documented to be associated with stock market development, including investor protection, legal origin, and stock exchange disclosure enforcement.

To test H2, we first measure firms' financial reporting quality by three variables: (1) the level of earnings management/earnings smoothing, (2) the likelihood of financial reporting restatements, and (3) the informativeness of annual earnings announcements. Models are then estimated in which the average financial reporting quality in each country-year is regressed on the measures of PAOs after controlling for investor protection, legal origin, and stock exchange disclosure enforcement. As we require all of the sample countries to have non-missing values on all of these country-level variables, our final sample consists of 36 countries and 51 PAOs. Appendix 4 provides detailed definitions and sources for all of the variables used in this paper.

## Measures of PAOs

### *PAO Measures Based on IFAC Survey Data*

Founded in 1977, IFAC is the major and most representative global organization for the accountancy profession. One of its primary missions is to serve the public interest by strengthening the profession and contributing to the development of strong international economies. As of the end of 2015, IFAC comprised more than 175 PAOs in more than 130 countries and jurisdictions and represented approximately 3 million accountants globally. Its main missions include supporting the development of high-quality international standards such as International Financial Reporting Standards (IFRS), promoting the adoption and implementation of these standards, and building the capacity of the PAOs. In addition, it supports four independent standard-setting boards that establish international standards on ethics, auditing and assurance, accounting education, and public sector accounting, including the International Auditing and Assurance Standards Board, the International Ethics Standards Board for Accountants, the International Public Sector Accounting Standards Board, and the International Accounting Education Standards Board (<https://www.ifac.org>).

IFAC membership not only demonstrates PAOs' willingness to become part of the global profession, but also

gives PAOs access to information, resources, and support that help them to strengthen the accounting profession in their own countries. In addition, IFAC organizes the World Congress of Accountants (WCOA), an event perceived as "The Olympics of the Accountancy Profession" by PAOs worldwide and which has been held every four years since 2002. Countries are selected to host the event based on the development of their PAOs. As a result, IFAC membership is not free. Specifically, IFAC requires its members to make financial contributions, and the membership fees are calculated using a formula based on the gross national income (GNI) per capita and the population of the country in which the PAO is based in addition to the PAO's membership. In addition, IFAC has a comprehensive admission process. Accordingly, only "PAOs recognized by law or general consensus within their countries as substantial national organizations from countries" around the world can be admitted as formal IFAC members, including, for example, AICPA (USA), CPA Australia, ACCA (UK), and JICPA (Japan).<sup>14</sup>

IFAC requires all of its members to participate in the IFAC Member Compliance Program initiated during 2005–2014. The program was designed to help members to recognize IFAC's vision of well-developed PAOs promoting economic growth and development by enhancing transparency and accountability in financial systems. The program includes a self-assessment questionnaire that must be completed by every PAO member concerning the PAO's role and responsibility with regard to accountancy ethics, education, investigation and discipline, and quality assurance.<sup>15</sup> Although the questionnaire responses are self-reported by the PAOs, IFAC staff closely guide and monitor questionnaire distribution and submission to ensure that responses are accurate and submitted in a timely fashion. For example, IFAC staff can require PAOs to clarify issues/uncertainties in their answers by submitting additional information. The IFAC survey results thus allow us to obtain comprehensive information on the

<sup>14</sup> PAOs that are not recognized as substantial national organizations can only be admitted as associates rather than formal members. The associates of IFAC are not required to complete the self-assessment questionnaire used to establish PAOs development score by our study. More information about IFAC's membership admission criteria and process can be found at <https://www.ifac.org/system/files/uploads/CAP/IFAC-Membership-Admission-Criteria-and-Process.pdf>.

<sup>15</sup> The full survey comprises three major parts: Part I, whose aim is to obtain an understanding of the country's regulatory framework; Part 2, which is a self-assessment questionnaire concerning the status quo institutions established or maintained by the PAO (we use this part to construct our PAO measure); and Part 3, which covers action plans demonstrating the progress the PAO has made in fulfilling its membership obligations and how it plans to do so in the future. We use a subset of questions in the self-assessment questionnaire that can be unambiguously quantified to construct the measures of PAOs.

ethical guidelines, educational requirements, and disciplinary mechanisms of the PAOs in all of our sample countries.

The details of the IFAC questionnaire and our PAOs measures are given in Appendix 2. The questions can be categorized into two types: general and specific. General questions concern whether a certain program or rule concerning ethics, education, or discipline has been established by a given PAO—for example, *are there established ethical requirements for members?* Specific questions are concerned with more specific variations in ethics, education, or discipline requirements. For example, if a PAO's answer to the foregoing general question is “yes,” then the specific follow-up question would be, for instance, *do the ethical requirements require professional accountants to comply with the fundamental principle ‘integrity’ as described in IFAC Code?* Appendix 2 also provides an evaluation of each PAO's answer to each question, to which a score ranging from 0 to 1 is assigned.

As noted, we construct two overall measures of PAO (*PAO\_general* and *PAO\_specific*) and three-dimensional measures of PAO (*PAO\_Ethics*, *PAO\_Education*, and *PAO\_Oversight*) using the score assigned to each PAO's response in the IFAC questionnaire. The first overall measure, *PAO\_general*, is calculated as the mean scores for the answers to all six general questions (i.e., *PAO\_general (1)* to *PAO\_general (6)* in Appendix 2). Appendix 3 tabulates the PAOs' answers to each of the six general questions and provides an example of how *PAO\_general* is calculated. Although this measure is available for all 36 countries in our sample, given the rudimentary nature of most of the general questions, we construct a second overall PAO measure, *PAO\_specific*, based on the average scores of the answers to the more specific questions (i.e., *PAO\_Oversight (ID1-ID8)*, *PAO\_Education (ED1-ED11)*, and *PAO\_Ethics (ET1-6)*). The second PAO measure is available for 18 sample countries. More specifically, *PAO\_specific* is the average score of all of the specific questions in the ethics (*PAO\_Ethics*), education (*PAO\_Education*), and investigation and discipline (*PAO\_Oversight*) sections of the IFAC questionnaire. For countries with multiple PAOs, we calculate a mean score for all of the PAOs in that country to form an aggregated country-level measure.<sup>16</sup>

#### *PAO Measures Based on Big 4 Auditors*

A common issue with self-reported survey data is the potential for optimistic response bias. For example, some PAOs may have an incentive to window-dress their

<sup>16</sup> Correlation analysis indicates a significant positive association between the score of each PAO in countries with multiple PAOs.

responses to the IFAC questionnaire to make themselves look better. However, a careful investigation of each of the PAOs included in the IFAC member list reveals that almost all members are reputable national organizations; thus, the concern over self-report bias is minimal. In addition, there is the potential for sampling bias because not all PAOs in a country are IFAC members, and non-members are not required to complete the questionnaire. However, given that IFAC membership comprises the most representative PAOs in the world's major economies and few specialized PAOs are non-IFAC members, we do not consider sampling bias to be a substantial concern in our study.<sup>17</sup>

Nevertheless, in addition to our survey-based PAO measures, we construct two additional outcome-based measures based on auditors' market shares in each country. Several international studies provide evidence supporting the superior audit quality of Big 4 auditors worldwide (e.g., Choi and Wong 2007; Michas 2011). In addition, Francis et al. (2013) suggest that Big 4 auditors' market share in a country reflects the overall demand for high-quality accounting and auditing service in a country. Accordingly, we construct a variable measuring the market share of Big 4 auditors, *PAO\_big4share1* (*PAO\_big4share2*), which is calculated as the total revenue (assets) of firms audited by Big 4 auditors divided by the total revenue (assets) of all firms for each country-year. Given that the greater market share of Big 4 auditors serves as an alternative manifestation of the perceived importance of professional accountants in general and public auditors in particular, this variable is expected to be positively associated with the development of PAOs in a given country. Indeed, both the Pearson and Spearman correlation results indicate that the alternative auditor market share-based PAO measures are significantly and positively associated with the IFAC survey-based PAO measures. The data on Big 4 auditors' assets and revenues for global samples are obtained from the S&P Capital IQ compustat database.

<sup>17</sup> While not all of the PAOs in our sample countries are affiliated with IFAC, the non-IFAC affiliated PAOs mainly operate like specialist bodies helping the work of accountants and auditors in specific fields such as taxation, forensic auditing, and systems auditing or for networking purposes. We conduct a search for each country included in our sample. Consistent with the specialized nature of these non-IFAC affiliated PAOs, we are only able to identify a few, such as The Association of International Accountants (AIA) and the Consultative Committee of Accountancy Bodies (CCAB) in the U.K., the National Association of State Boards of Accountancy (NASBA) and the Information Systems Audit and Control Association (ISACA) in the U.S., and the Hong Kong Business Accountants Association (HKBAA) and the Society of Chinese Accountants and Auditors (SCAA) in Hong Kong.



## Stock Market Development Variables

Frost et al. (2006) define stock market development as the importance and strength of the capital market in a given economy. Empirical studies adopt a variety of proxies for such development. In this study, we follow Frost et al. (2006) and use five variables to measure the level of a country's stock market development. More specifically, we measure a country's overall stock market development, *MARKDEV*, as the mean of five standardized variables: (1) stock market capitalization relative to GDP, (2) stock market capitalization held by minorities deflated by GDP, (3) number of listed domestic companies deflated by country population (in millions), (4) number of newly listed domestic companies deflated by country population (in millions), and (5) per-capita annual value traded on the stock market (in US dollars).

To better match the country-year analysis, our sample period starts in 2007 and ends in 2012 because most PAO responses to the IFAC questionnaire were reported during this period.<sup>18</sup> Table 1 presents the main empirical measures used in our analyses. Panel A describes the average stock market development in the 2007–2012 period, revealing wide variation across countries. In additional analyses, we also validate the robustness of the stock market development measures by using multiple economic development measures. Panel B of Table 1 shows that there are also substantial variations in PAO measures across countries regardless of whether the overall or dimensional PAO measure is used. In addition, *PAO\_specific* features wider variation than *PAO\_general*, which is consistent with the specific measure representing more specific aspects of the PAOs surveyed. Of the three PAO component measures, *PAO\_Ethics* has the least variation, but it also has more missing values than the other two.

## Financial Reporting Quality Variables

We measure financial reporting quality for each country-year using three variables: (1) the level of earnings management/earnings smoothing, (2) the likelihood of financial reporting restatements, and (3) the informativeness of annual earnings announcements. First, we compute an altered form of the variable of the average level of earnings management in a country-year developed by Leuz et al. (2003) and proxy the average level of earnings quality in a country-year by the level of earnings smoothing.<sup>19</sup> Our first

<sup>18</sup> We perform additional analyses on an earlier sample period, 2000–2006, instead of 2007–2012. Our conclusions are unchanged.

<sup>19</sup> The aggregate earnings management score from Leuz et al. (2003) is the average rank of two earnings-smoothing measures and two earnings-discretion measures, including the magnitude of accruals and small loss avoidance. Our results indicate that the positive

earnings smoothing measure is *SMOOTH\_sd*, which is the median ratio of the firm-level standard deviations of operating income and operating cash flow for each country-year. The second is *SMOOTH\_corr*, which is the Spearman correlation between a firm-level change in accruals and the change in cash flow from operations for a given country-year. Both measures are multiplied by  $-1$  so that a higher value suggests a higher level of earnings management/smoothing (or lower quality of earnings quality).

Second, the accounting literature generally recognizes accounting restatements to the result of intentional misreporting or unintentional errors. Thus, restatements are considered a measure of earnings quality (Hennes et al. 2008; Dechow et al. 2010; Plumlee and Yohn 2010). We use the country-year likelihood of financial reporting restatements measured by the proportion of firms restating any of their statements (i.e., income statement, balance sheet, or cash flow statement) in each country-year as an inverse proxy of earnings quality. Given that better financial reporting practices reduce accounting errors, lowering the likelihood of a restatement, we predict a negative relationship between the development of PAOs and restatement likelihood.

One weakness of this measure is that restatement occurrences hinge on errors being committed and the existence of a structure for detecting errors. In other words, a higher restatement occurrence could result either from the existence of more errors on financial statements or from a higher error detection rate. However, given the significantly positive correlation between PAO development and legal protection, as indicated in Table 3, if a higher detection rate in countries with stronger legal protection explains our findings, then we should observe a positive relation between the development of PAOs and restatement occurrence in a country. Our results suggest the opposite, supporting the argument that a higher level of PAO development reduces such occurrences by reducing the errors made by accounting practitioners.

Finally, following Defond et al. (2007), who find a greater stock market reaction to earnings announcements in countries with higher earnings quality, our third proxy for financial reporting quality is the informativeness of annual earnings announcements measured by *AbsCAR*, the mean of the absolute cumulative abnormal returns (CAR) around the annual earnings announcements of all firms in each

Footnote 19 continued

association between the development of PAOs and the aggregate earnings management score measure introduced by Leuz et al. (2003) is mainly driven by the two earnings-smoothing measures. We find no significant relationship between the development of PAOs and any of the two earnings-discretion measures. As a result, we use the altered form of earnings quality measure developed by Leuz et al. (2003) and report only the results based on the two earnings-smoothing measures.

**Table 1** Empirical measures

Country	Overall market development measure <i>MARKDEV</i>	Individual market development measure				
		<i>STC</i>	<i>STC_MIN</i>	<i>N_LIST</i>	<i>N_NEWLIST</i>	<i>TRADE</i>
Panel A: Overall market development and its components (2007–2012 averages)						
Argentina	−0.71	16.48	15.61	2.53	0.07	128
Australia	0.81	101.65	96.49	87.29	4.31	50,250
Austria	−0.56	26.17	23.09	10.60	0.24	7706
Belgium	−0.32	56.07	51.32	14.96	0.56	14,221
Brazil	−0.44	64.06	56.74	2.05	0.11	4061
Canada	1.24	115.76	106.59	113.45	8.05	43,221
Chile	−0.08	116.81	105.59	13.69	0.28	2728
Denmark	−0.01	64.47	60.00	36.17	1.28	30,390
Finland	−0.05	68.91	60.76	23.17	0.31	44,646
France	−0.15	72.83	64.28	14.03	0.27	32,397
Germany	−0.39	42.10	37.72	7.79	0.31	24,804
Greece	−0.46	30.75	26.20	25.64	0.42	4984
Hong Kong	4.10	472.58	381.40	182.22	5.25	199,766
Indonesia	−0.58	40.77	39.69	1.76	0.06	495
Ireland	−0.45	38.30	36.80	11.57	0.72	8891
Israel	0.34	83.11	75.73	79.48	2.77	13,581
Italy	−0.57	24.50	19.77	4.93	0.16	15,964
Japan	−0.04	72.05	62.49	27.84	0.44	37,338
Luxembourg	1.20	182.84	165.69	65.43	9.78	877
Malaysia	0.21	139.13	131.96	34.09	0.83	3837
Mexico	−0.62	36.64	31.12	1.12	0.05	937
Netherlands	−0.03	79.31	72.44	7.09	0.37	51,882
New Zealand	−0.35	38.03	36.12	29.97	0.97	5198
Norway	0.21	55.58	49.31	40.18	2.71	56,596
Philippines	−0.43	67.43	62.84	2.73	0.07	286
Poland	−0.47	33.47	29.70	13.88	1.28	1949
Singapore	1.12	145.64	128.16	92.94	4.96	54,046
South Africa	0.57	231.49	223.34	7.64	0.32	7378
South Korea	0.13	86.82	76.49	36.11	1.31	34,460
Spain	0.27	84.03	76.81	72.26	0.11	39,069
Sweden	0.54	101.85	93.21	34.78	4.10	59,562
Switzerland	1.32	201.92	180.02	31.13	1.26	140,195
Taiwan	0.65	155.86	146.35	40.04	2.30	41,111
Thailand	−0.35	73.14	68.37	7.72	0.20	2613
UK	0.55	117.75	109.54	35.91	1.22	77,303
USA	0.62	108.71	101.54	14.99	1.65	112,970
Mean	0.19	95.75	86.20	34.09	1.64	34,051

Country	Overall PAOs measure		PAOs component measures		
	<i>PAO_general</i>	<i>PAO_specific</i>	<i>PAO_Oversight</i>	<i>PAO_Education</i>	<i>PAO_Ethics</i>

Panel B: Professional accountancy organizations (PAOs) measure and its components

Argentina	0.75	0.67	1.00	0.00	1.00
Australia	1.00	0.88	0.96	0.81	–
Austria	0.92	0.67	–	0.50	0.83
Belgium	0.92	0.78	1.00	0.46	1.00
Brazil	0.83	0.52	0.71	0.33	–

**Table 1** continued

Country	Overall PAOs measure		PAOs component measures		
	<i>PAO_general</i>	<i>PAO_specific</i>	<i>PAO_Oversight</i>	<i>PAO_Education</i>	<i>PAO_Ethics</i>
Canada	1.00	0.94	0.96	0.89	1.00
Chile	0.75	0.31	0.63	0.00	–
Denmark	1.00	0.98	1.00	0.96	–
Finland	0.67	0.64	0.00	0.92	1.00
France	1.00	0.64	0.00	0.92	1.00
Germany	0.92	0.93	0.88	0.92	1.00
Greece	0.92	0.88	0.88	0.76	1.00
Hong Kong	1.00	1.00	1.00	1.00	–
Indonesia	0.92	0.86	1.00	0.73	–
Ireland	0.92	0.82	1.00	0.64	1.00
Israel	0.92	0.75	–	0.50	1.00
Italy	1.00	0.93	0.88	0.92	1.00
Japan	1.00	0.95	1.00	0.85	1.00
Luxembourg	1.00	0.88	0.88	0.81	1.00
Malaysia	0.96	0.75	0.88	0.64	0.83
Mexico	0.83	0.54	0.75	0.33	–
Netherlands	0.92	0.81	0.88	0.75	–
New Zealand	1.00	0.92	0.88	0.96	–
Norway	1.00	0.88	–	0.92	0.83
Philippines	0.92	0.63	0.75	0.50	–
Poland	1.00	0.87	0.88	0.91	0.83
Singapore	1.00	0.92	1.00	0.84	–
South Africa	1.00	0.93	0.88	0.92	1.00
South Korea	1.00	0.97	1.00	0.91	1.00
Spain	1.00	0.85	0.88	0.82	–
Sweden	1.00	0.86	–	0.86	–
Switzerland	1.00	0.90	0.88	0.82	1.00
Taiwan	0.67	0.25	0.00	0.50	–
Thailand	0.92	0.67	0.75	0.58	–
UK	0.98	0.87	0.96	0.72	1.00
USA	1.00	0.90	0.88	0.83	1.00
Mean	0.93	0.79	0.81	0.71	0.97

Panel A reports the 2007 to 2012 average value of the stock market development variables. *MARKDEV* is overall stock market development; *STC* is stock market capitalization relative to GDP; *STC\_MIN* is stock market capitalization held by minorities deflated by GDP; *N\_LIST* is the number of listed domestic companies deflated by population (in millions); *N\_NEWLIST* is the number of newly listed domestic companies deflated by population (in millions); and *TRADE* is the per-capita annual value traded on the stock market (in US dollars). Panel B reports all of the PAOs measures. *PAO\_general* (*PAO\_specific*) is the overall PAO measure based on the answers to all of the general (specific) questions on the IFAC questionnaire and *PAO\_Oversight*, *PAO\_Education*, and *PAO\_Ethics* are the mean scores of the answers in the investigation and discipline, education, and ethics dimensions of the PAO variable, respectively. Hyphens indicate missing values. Refer to Appendix 4 for more detailed variable definitions

country-year. More specifically, firm-level absolute CAR is defined as the absolute value of the two-day market-adjusted cumulative return in percentage form during the [0, +1] window, where day 0 is the annual earnings announcement date. All firm-level data, including earnings management measures, restatement measures, and earnings announcement dates and stock prices, are obtained from S&P Capital IQ compustat database.

## Controls

A rich body of accounting research shows that financial reporting quality is positively associated with rule of law, investor protection, and legal origin (see, for example, Ball et al. 2000; Leuz et al. 2003). The law and finance literature views the legal rules protecting investors' property rights as constituting the foundation for financial contracting and

thereby affecting the overall development of securities markets. As such, in our study, we control for rule of law, investor protection, and legal origin.

We measure rule of law and investor protection by various proxies used in prior studies. Our variable for overall rule of law and investor protection, *LEGPRO*, is the mean of seven standardized rule of law and investor protection variables. Legal origin, *ENGLISH*, is constructed as an indicator variable that is equal to 1 if a country's legal system is based on English common law and 0 otherwise. We control for a stock exchange's enforcement of the disclosure rule constructed by Frost et al. (2006), *DISCLOSURE*.<sup>20</sup> This measure captures the extent to which disciplinary actions are enforced by a stock exchange when listed firms issue false financial statements and misleading material announcements. Frost et al. (2006) show that as a dimension of investor protection, stock exchange-level disclosure rules and enforcement are associated with better-developed stock markets.

We estimate the following empirical model using country-level panel data from 2007 to 2012 to examine the relationship between the development of PAOs in a country and its stock market development/financial reporting quality. We expect  $\beta_1$  to be significantly positive.

$$\begin{aligned} & \text{MARKDEV or Financial Reporting Quality} \\ & = \beta_0 + \beta_1 \text{PAO\_general/PAO\_specific} \\ & + \beta_2 \text{DISCLOSURE} + \beta_3 \text{LEGPRO} + \beta_4 \text{ENGLISH} + e \end{aligned} \quad (1)$$

## Tests and Results

We first present the results for stock market development and then those for financial reporting quality.

### Empirical Tests of PAOs and Stock Market Development

Table 2 reports the descriptive statistics for the full sample of 36 countries. The measures of the development of PAOs yield relatively high values, with the medians of all five measures above 0.8 (with a maximum score of 1). These high values may result from IFAC's efforts to promote its compliance program and its requirement that PAO members establish and develop ethical and educational requirements and disciplinary mechanisms.

<sup>20</sup> Frost et al. (2006) also measure the extensiveness of disclosure rules for each stock exchange. Our main results are qualitatively the same if we use stock exchange disclosure rules rather than the enforcement of those rules as a control.

Table 3 reports the Pearson correlations of the country-level variables in the full sample. Consistent with our expectation, *PAO\_general* is significantly and positively correlated with the overall market development measure, *MARKDEV*. *LEGPRO* and *ENGLISH* are significantly correlated with both *PAO\_general* and *MARKDEV*, and it is thus important to control for them in the multivariate analysis. Our alternative PAO measures, *PAO\_big4share1* and *PAO\_big4share2*, are both significantly and positively correlated with *PAO\_general*, which suggests that they capture similar constructs.

To estimate Eq. (1), we regress the overall market development measure, *MARKDEV*, on *PAO\_general* in the full sample (36 countries with 216 country-year observations) and on *PAO\_specific* in the partial sample (18 countries with 108 country-year observations).<sup>21</sup> Table 4 reports the ordinary least squares (OLS) estimates of the relation between the development of PAOs and stock market development. Panel A presents the full sample results using *PAO\_general*, and Panel B presents the partial sample results using *PAO\_specific*. The results in the two panels are qualitatively similar. To validate our model, in first column, we exclude our test variable and only test the association between stock market development and *DISCLOSURE*, *LEGPRO*, or *ENGLISH*, the three major country-level variables documented by prior studies to be associated with stock market development. Consistent with Frost et al. (2006), *DISCLOSURE* is significantly and positively associated with overall market development in both samples. In addition, consistent with La Porta et al. (1997, 1998, 2000), rule of law and investor protection are positively associated with stock market development.

More importantly, regardless of whether we do not include any country-level controls (column 2), or include only the country-level institutional variables well-documented by prior study, such as Frost et al. (2006) (column 3), or even include additional time-varying, country-level characteristics including *GDP per capita*, *OPENNESS* and *INFLATION* as controls (column 4),<sup>22</sup> *PAO\_general*, our

<sup>21</sup> As *PAO\_specific* is the mean value of three components of development of PAOs that are available only in the partial sample, we can only examine its effect in the partial sample.

<sup>22</sup> In our model, we follow Frost et al. (2006) in choosing country-level institutional variables to include for model validation and better comparison. However, it is also possible that other country characteristics that are likely to be correlated with the development of PAOs but are not included in the model may drive the results of PAOs on stock market development and accounting quality. To reduce such concern, we further include in our model several time-varying country-level controls including GDP per capita, a variable measuring the openness of a country (i.e., international trade as a percentage of GDP), and inflation. Data on GDP per capita and openness are obtained from IMD World Competitiveness Database and the data on inflation is obtained from the World Bank. We thank our reviewers for making this suggestion.



**Table 2** Descriptive statistics

	N	Mean	SD	1st quar.	Median	3rd quar.
Stock market development variables						
<i>MARKDEV</i> (overall measure)	216	0.19	0.92	-0.44	-0.07	0.45
(1) <i>STC</i>	216	95.75	86.81	44.55	72.85	122.02
(2) <i>STC_MIN</i>	216	86.20	74.13	40.99	66.30	111.00
(3) <i>N_LIST</i>	216	34.09	38.17	8.11	23.57	37.74
(4) <i>N_NEWLIST</i>	216	1.64	2.93	0.11	0.37	1.80
(5) <i>TRADE</i>	216	34,051	46,209	3412	17,569	45,167
PAOs variables						
<i>PAO_general</i>	216	0.93	0.09	0.92	0.99	1.00
<i>PAO_specific</i>	216	0.79	0.18	0.67	0.86	0.92
(1) <i>PAO_Ethics</i>	126	0.97	0.07	1.00	1.00	1.00
(2) <i>PAO_Education</i>	216	0.71	0.25	0.54	0.81	0.91
(3) <i>PAO_Oversight</i>	192	0.81	0.28	0.81	0.88	1.00
Big 4 variables						
<i>PAO_big4share1</i>	216	0.85	0.23	0.83	0.95	0.99
<i>PAO_big4share2</i>	216	0.88	0.23	0.92	0.97	0.99
Earnings management variables						
<i>SMOOTH_sd</i>	216	-0.84	0.14	-0.89	-0.82	-0.72
<i>SMOOTH_corr</i>	216	0.59	0.16	0.50	0.61	0.71
Restatement variables						
<i>RESTATE</i>	216	0.38	0.18	0.24	0.35	0.50
Informativeness of earnings announcement variable						
<i>AbsCAR</i>	216	2.23	0.70	1.80	2.15	2.67
Other country-level controls						
<i>DISCLOSURE</i>	216	-0.03	0.61	-0.49	-0.22	0.33
<i>LEGPRO</i>	216	0.10	0.72	-0.40	0.23	0.64
<i>ENGLISH</i>	216	0.33	0.47	0.00	0.00	1.00

This table reports the descriptive statistics for the full sample of 36 countries. *MARKDEV* is overall stock market development; *STC* is stock market capitalization relative to GDP; *STC\_MIN* is stock market capitalization held by minorities deflated by GDP; *N\_LIST* is the number of listed domestic companies deflated by population (in millions); *N\_NEWLIST* is the number of newly listed domestic companies deflated by population (in millions); and *TRADE* is the per-capita annual value traded on the stock market (in US dollars). Panel B reports all of the PAOs measures. *PAO\_general* (*PAO\_specific*) is the overall PAO measure based on the answers to all general (specific) questions on the IFAC questionnaire; *PAO\_Oversight*, *PAO\_Education*, and *PAO\_Ethics* are the mean scores of the answers in the investigation and discipline, education, and ethics dimensions of the PAO variable, respectively. *PAO\_big4share1* (*PAO\_big4share2*) is the market share of Big 4 auditors in a country-year calculated based on the total revenue (assets) of Big 4 auditors' client firms. *SMOOTH\_sd* is the median ratio of the firm-level standard deviations of operating income and operating cash flow for each country-year multiplied by -1. *SMOOTH\_corr* is the Spearman correlation between a change in accruals and change in cash flow from operations in a country-year multiplied by -1. *RESTATE* is the ratio of the number of observations with restated financial statements over all of the observations. *AbsCAR* is the mean of the firm-level absolute CAR around the annual earnings announcements in each country-year. *DISCLOSURE* is a stock exchange's enforcement of disclosure rules, *LEGPRO* is the overall rule of law and investor protection, and *ENGLISH* is an indicator variable equal to 1 if a country's legal system is based on English law. Refer to Appendix 4 for more detailed variable definitions

main variable of interest, consistently loads in a significantly positive manner, which is consistent with H1. Similarly, the results in Panel B show that *PAO\_specific* is

also significantly and positively associated with stock market development. In sum, the results in Table 4 suggest that the development of PAOs in a country plays an

**Table 3** Correlations

	1	2	3	4	5	6	7	8	9	10
1. <i>MARKDEV</i>										
2. <i>SMOOTH_sd</i>	<b>-0.281</b>									
3. <i>SMOOTH_corr</i>	<b>-0.303</b>	<b>0.753</b>								
4. <i>RESTATE</i>	<b>-0.317</b>	<b>0.332</b>	<b>0.388</b>							
5. <i>AbsCAR</i>	<b>0.221</b>	<b>-0.211</b>	<b>-0.318</b>	<b>-0.324</b>						
6. <i>PAO_general</i>	<b>0.283</b>	<b>-0.247</b>	<b>-0.335</b>	<b>-0.327</b>	<b>0.230</b>					
7. <i>PAO_big4share1</i>	<b>0.274</b>	<b>-0.323</b>	<b>-0.336</b>	<b>-0.276</b>	0.072	<b>0.156</b>				
8. <i>PAO_big4share2</i>	<b>0.212</b>	<b>-0.285</b>	<b>-0.268</b>	<b>-0.225</b>	0.075	<b>0.160</b>	<b>0.968</b>			
9. <i>DISCLOSURE</i>	0.108	<b>-0.174</b>	0.054	<b>-0.223</b>	0.061	<b>0.193</b>	-0.031	-0.033		
10. <i>LEGPRO</i>	<b>0.379</b>	<b>-0.483</b>	<b>-0.593</b>	<b>-0.394</b>	<b>0.173</b>	<b>0.287</b>	<b>0.492</b>	<b>0.435</b>	0.075	
11. <i>ENGLISH</i>	<b>0.393</b>	<b>-0.556</b>	<b>-0.476</b>	<b>-0.312</b>	<b>0.275</b>	<b>0.305</b>	0.014	0.001	<b>0.268</b>	<b>0.432</b>

This table reports the Pearson correlations of our variables for the full sample of 36 countries. *MARKDEV* is overall stock market development. *PAO\_general* is the overall PAO measure based on the answers to all of the general questions on the IFAC questionnaire; *PAO\_big4share1* (*PAO\_big4share2*) is the market share of Big 4 auditors in a country-year calculated based on total revenue (assets) of Big 4 auditors' client firms. *SMOOTH\_sd* is the median ratio of the firm-level standard deviations of operating income and operating cash flow for each country-year multiplied by  $-1$ . *SMOOTH\_corr* is the Spearman correlation between a change in accruals and change in cash flow from operations in a country-year multiplied by  $-1$ . *RESTATE* is the ratio of the number of observations with restated financial statements over all observations. *AbsCAR* is the mean of the firm-level absolute CAR around the annual earnings announcements in each country-year. *DISCLOSURE* is a stock exchange's enforcement of disclosure rules, *LEGPRO* is the overall rule of law and investor protection, and *ENGLISH* is an indicator variable equal to 1 if a country's legal system is based on English law. Refer to Appendix 4 for more detailed variable definitions. Significant correlations are in bold and italic ( $p < 0.10$ , two-tailed test)

important role in facilitating stock market development incremental to a country's stock exchange disclosure rules, investor protection strength, and legal origin.<sup>23</sup>

### Empirical Tests of PAO and Financial Reporting Quality

Tables 5, 6 and 7 present the results on financial reporting quality. Table 5 reports the OLS estimates of the relation between the development of PAOs and financial reporting quality measured by earnings smoothing. For consistency with Table 4, we conduct all of the tests at the country-year level.<sup>24</sup> The dependent variable in models (1), (2), (5) and (6) is *SMOOTH\_sd*, whereas that in models (3), (4), (7) and (8) is *SMOOTH\_corr*. In models (1) to (4), we consistently observe that the estimated coefficients of *PAO\_general* are significantly negative albeit insignificant in column (2) when additional time-varying country-level controls are included. The results for *PAO\_specific* in models (5) to (6)

<sup>23</sup> Moreover, to better distinguish between the rule of law and investor protection strength in a given country, we repeat our test by separating our overall *LEGPRO* variable into one variable that is more related to the rule of law (calculated as the mean of *RL\_F*, *FL\_H*, and *RL\_W*) and another that is more related to investor protection (calculated as the mean of *IP*, *SR*, *MIP\_G*, and *IP\_G*). We find that our results are robust to this test model. Finally, the results remain robust to the exclusion of 2007 and 2008, the years in which the financial crisis occurred.

<sup>24</sup> Conducting a similar test on firm-year-level data does not change our conclusion.

are generally consistent with those for *PAO\_general*. In sum, our results suggest that well-developed PAOs are associated with lower levels of earnings management/smoothing, a result that is consistent with H2.<sup>25</sup>

Table 6 reports the Tobit estimates of the relation between the development of PAOs and the restatement of financial statements.<sup>26</sup> S&P Capital IQ provides the original financial results reported by firms, and the subsequently reported information for every historical annual, and quarterly period for every company. For each firm-year, Capital IQ uses four different codes to indicate the possible existence of restatement and the reason for restatement if firms report different results in a later time. These codes include NC (No Change from original filing), RD (Reclassified for Disposal of business or assets), RS (financial results including, for example, Net Income, Retained Earnings, or Cash from Operations are Restated and the restated results are fundamentally different from originally reported number), and RC (Reclassified—results are somewhat different from original, but bottom-line results are the same). Given its global coverage, we obtain

<sup>25</sup> In an additional test, we also interact the development of PAOs with an aggregated earnings smoothing measure to examine whether the relationship between PAOs and stock market development varies with firms' earnings management. We find a significant and negative coefficient on the interaction term. This finding indicates that PAOs' effect on stock market development is stronger in countries with lower earnings management.

<sup>26</sup> The results are similar when the OLS regression model is used.

**Table 4** Regression results (OLS): PAOs and stock market development

Dep. var.	<i>MARKDEV</i>			
	(1)	(2)	(3)	(4)
Panel A: <i>PAO_general</i> in full sample (36 countries)				
<i>PAO_general</i>		1.887*** [0.000]	0.851** [0.032]	0.848* [0.055]
<i>DISCLOSURE</i>	0.118** [0.039]		0.112* [0.055]	-0.010 [0.860]
<i>LEGPRO</i>	0.368*** [0.000]		0.358*** [0.000]	0.073 [0.285]
<i>ENGLISH</i>	0.233*** [0.006]		0.182** [0.035]	0.486*** [0.000]
<i>GDP</i>				0.006*** [0.004]
<i>OPENNESS</i>				0.008*** [0.000]
<i>INFLATION</i>				0.012 [0.502]
Constant	-0.060 [0.157]	-1.728*** [0.000]	-0.828** [0.024]	-1.573*** [0.000]
Observations	216	216	216	204
Adjusted <i>R</i> -squared	0.341	0.089	0.343	0.578
Panel B: <i>PAO_specific</i> in partial sample (18 countries)				
<i>PAO_specific</i>		1.677*** [0.002]	1.709*** [0.000]	1.710*** [0.000]
<i>DISCLOSURE</i>	0.305*** [0.002]		0.320*** [0.000]	0.560*** [0.000]
<i>LEGPRO</i>	0.580*** [0.000]		0.482*** [0.000]	0.406*** [0.000]
<i>ENGLISH</i>	-0.129 [0.445]		-0.118 [0.371]	-0.008 [0.945]
<i>GDP</i>				0.020*** [0.000]
<i>OPENNESS</i>				-0.008*** [0.000]
<i>INFLATION</i>				0.042*** [0.008]
Constant	0.117 [0.126]	-1.370*** [0.003]	-1.402*** [0.000]	-1.858*** [0.000]
Observations	108	108	108	105
Adjusted <i>R</i> -squared	0.304	0.083	0.451	0.712

This table reports the OLS estimates of the relation between PAOs and stock market development. Panel A reports the full sample results for *PAO\_general* and panel B presents the partial sample results for *PAO\_specific*. *MARKDEV* is overall stock market development. *PAO\_general* (*PAO\_Specific*) is the overall PAOs measure based on the answers to all of the general (specific) questions on the IFAC questionnaire. *DISCLOSURE* is a stock exchange's enforcement of disclosure rules, *LEGPRO* is the overall rule of law and investor protection, and *ENGLISH* is an indicator variable equal to 1 if a country's legal system is based on English law. Please refer to Appendix 4 for more detailed variable definitions. Additional time-varying country-level control variables included in our model are GDP per capita (in thousands), a variable measuring the openness of a country (i.e., international trade as a percentage of GDP), and inflation. The numbers in brackets are *p* values. \*\*\*, \*\*, and \* indicate that correlations are statistically significant at the 1, 5, and 10% levels, respectively

**Table 5** Regression results (OLS): PAOs and earnings management/earnings smoothing

Dep. var.	<i>SMOOTH_sd</i>		<i>SMOOTH_corr</i>		<i>SMOOTH_sd</i>		<i>SMOOTH_corr</i>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>PAO_general</i>	-0.410*** [0.000]	-0.052 [0.600]	-0.292*** [0.000]	-0.239*** [0.009]				
<i>PAO_specific</i>					0.085 [0.478]	-0.322*** [0.005]	-0.173* [0.078]	-0.374*** [0.000]
<i>DISCLOSURE</i>	0.078*** [0.000]	0.035*** [0.009]	0.057*** [0.000]	0.032*** [0.008]	0.083*** [0.000]	0.021 [0.363]	0.084*** [0.000]	0.051*** [0.007]
<i>LEGP</i>	-0.120*** [0.000]	-0.001 [0.979]	-0.094*** [0.000]	-0.070*** [0.000]	-0.044* [0.056]	-0.067** [0.033]	-0.070*** [0.000]	-0.038 [0.146]
<i>ENGLISH</i>	-0.152*** [0.000]	-0.235*** [0.000]	-0.110*** [0.000]	-0.116*** [0.000]	-0.277*** [0.000]	-0.250*** [0.000]	-0.229*** [0.000]	-0.252*** [0.000]
<i>Constant</i>	-0.437*** [0.000]	-0.712*** [0.000]	0.916*** [0.000]	0.845*** [0.000]	-0.894*** [0.000]	-0.365*** [0.001]	0.815*** [0.000]	1.098*** [0.000]
Additional Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	216	204	216	204	108	105	108	105
Adj. R-squared	0.636	0.669	0.543	0.631	0.538	0.665	0.635	0.730

This table reports the OLS estimates of the relation between the development of PAOs and earnings management measured by earnings smoothing. The dependent variable in columns (1) and (3) is *SMOOTH\_sd*, which is the median ratio of the firm-level standard deviations of operating income and operating cash flow in a country-year, and that in columns (2) and (4) is *SMOOTH\_corr*, which is the Spearman correlation between a change in accruals and the change in cash flow from operations in a country-year. Both are multiplied by  $-1$  such that a higher value means more smoothing and lower earnings quality. *PAO\_general* (*PAO\_specific*) is the overall PAO measure based on the answers to all of the general (specific) questions on the IFAC questionnaire. *DISCLOSURE* is a stock exchange's enforcement of disclosure rules, *LEGP* is the overall rule of law and investor protection, and *ENGLISH* is an indicator variable equal to 1 if a country's legal system is based on English law. Please refer to Appendix 4 for more detailed variable definitions. Additional time-varying country-level control variables included in our model are GDP per capita, a variable measuring the openness of a country (i.e., international trade as a percentage of GDP), and inflation. The numbers in brackets are *p* values. \*\*\*, \*\*, and \* indicate that the correlations are statistically significant at the 1, 5, and 10% levels, respectively

restatement of financial data from Capital IQ. To correctly capture restatement, in constructing our sample, we focus only on firm-years with the code of "RS—Restated." In addition, given that many firms experienced change from local accounting standards to International Financial Reporting Standards during last decade, we exclude all restatement cases resulted from a change in accounting standards from our sample.<sup>27</sup> Consistent with our prediction, Table 6 results indicate that the development of PAOs is negatively associated with the likelihood of restatements, providing further support for H2.

<sup>27</sup> Although the average likelihood of restatement appears to be very high in Table 2, a more careful examination indicates that it is mainly driven by the restatement of firms in relatively small countries and firms with small firm size. For example, for both US and Canada, the average likelihood of restatement for firms in each of these two countries in our sample is about 11%. This average appears to be reasonable given the fact that Capital IQ Compustat tends to have higher firm coverage and thus more small firms are included. Because firms with small size may be more likely to restate their financial information for multiple years during our sample period, in robustness test, we restrict our restatement sample to those firms with restatement for the very first time during our sample period and find our inference unaltered.

The OLS estimates on annual earnings announcements are presented in Table 7. Both *PAO\_general* and *PAO\_specific* load in a significantly positive fashion. Therefore, in general, the results in Table 7 suggest that well-developed PAOs are an important factor affecting stock markets' reaction to firms' annual earnings announcements.

### Additional and Robustness Tests

We perform several additional and robustness tests in this section. In the first additional test, we further verify our main results using two alternative outcome-based PAO measures proxied by the market share of Big 4 auditors. Table 8 tabulates the estimations in which overall stock market development is regressed on either *PAO\_big4share1* or *PAO\_big4share2*. In most models, the market share of Big 4 auditors variables load significantly positively, a result that is consistent with our prediction, thus further validating our main results using self-reporting PAO measures.



**Table 6** Regression results (Tobit): PAOs and financial restatements

Dep. var.	<i>RESTATE</i>			
	(1)	(2)	(3)	(4)
<i>PAO_general</i>	-0.366*** [0.004]	-0.585*** [0.000]		
<i>PAO_specific</i>			-0.262* [0.058]	-0.245* [0.085]
<i>DISCLOSURE</i>	-0.042** [0.026]	-0.042** [0.029]	-0.016 [0.513]	-0.025 [0.374]
<i>LEGPRO</i>	-0.073*** [0.000]	-0.046* [0.051]	-0.061** [0.020]	-0.063* [0.065]
<i>ENGLISH</i>	-0.035 [0.189]	-0.062** [0.045]	-0.089** [0.039]	-0.077 [0.109]
Constant	0.736*** [0.000]	0.962*** [0.000]	0.596*** [0.000]	0.517*** [0.000]
Additional controls	No	Yes	No	Yes
Observations	216	204	108	105
pseudo-R-squared	0.467	0.617	0.383	0.413

This table reports the Tobit model estimates of the relation between the development of PAOs and the proportion of firms with a restatement in a country-year. The dependent *RESTATE* is the ratio of the number of observations with restated financial statements over all observations. *PAO\_general* is the overall PAO measure based on the answers to all of the general questions on the IFAC questionnaire and *PAO\_specific* is the overall PAO measure based on the answers to all of the specific questions on the IFAC questionnaire. *DISCLOSURE* is a stock exchange's enforcement of disclosure rules, *LEGPRO* is the overall rule of law and investor protection, and *ENGLISH* is an indicator variable equal to 1 if a country's legal system is based on English law. Please refer to Appendix 4 for more detailed variable definitions. Additional time-varying country-level control variables included in our model are GDP per capita, a variable measuring the openness of a country (i.e., international trade as a percentage of GDP), and inflation. The numbers in brackets are *p* values. \*\*\*, \*\*, and \* indicate that correlations are statistically significant at the 1, 5, and 10% levels, respectively

In the second additional test, we repeat our tests on the three components of PAOs to shed light on the relative importance of each dimension of PAO development on stock market development. The results are presented in Table 9. Consistent with our main finding, the results of this test show a significantly positive association between each of the three PAO components and a country's stock market development. This finding suggests that all three dimensions of PAOs development—stringent ethical requirements, high-level educational requirements, and the presence of an investigation and discipline mechanism—are all important factors in the development of a country's accounting profession and ultimately in the development of a country's stock market. More importantly, the results of this test show that relative to the educational requirements and oversight mechanism, the ethical development of PAOs appears to have the strongest positive association with the country's stock market development.<sup>28</sup> This finding thus lends strong support to the claim that ethics is

the key factor affecting the quality of financial reporting systems (Ball et al. 2003).

Given the large number of observations with missing ethical requirement data, in a second part of this additional test, we also examine the possible variation in the relationship between PAOs and stock market development across observations with and without missing data on the ethical dimension. Our result (untabulated) indicates that the positive relationship between PAOs and stock market development documented in our study varies across these two subsamples. Specifically, we find a more positive association between PAOs and stock market development in countries without missing values. This finding provides support for the conjecture that countries that are more confident about their ethical development tend to be more likely to answer all questions.

In our third additional test, we explore possible variations in the link between PAOs and stock market development across countries. More specifically, we examine

<sup>28</sup> We directly test the significance of the differences between (1) the estimated coefficient for *PAO\_Ethics* and that for *PAO\_Education*, and (2) the estimated coefficient for *PAO\_Ethics* and that for *PAO\_Oversight*. In both tests, we find that *PAO\_Ethics* has a

Footnote 28 continued statistically higher association with *MARKDEV* than *PAO\_Education* and *PAO\_Oversight*.

**Table 7** Regression results (OLS): PAOs and informativeness of annual earnings announcements

Dep. var.	<i>AbsCAR</i>			
	(1)	(2)	(3)	(4)
<i>PAO_general</i>	0.924** [0.017]	1.598*** [0.002]		
<i>PAO_specific</i>			0.795** [0.034]	1.014* [0.078]
<i>DISCLOSURE</i>	0.012 [0.835]	-0.006 [0.913]	-0.019 [0.793]	0.096 [0.417]
<i>LEGPRO</i>	0.094** [0.010]	0.145** [0.021]	0.104* [0.067]	0.281** [0.037]
<i>ENGLISH</i>	0.440*** [0.000]	0.387*** [0.000]	0.403*** [0.000]	0.245 [0.121]
Constant	1.180*** [0.001]	0.834* [0.079]	1.407*** [0.000]	1.978*** [0.000]
Additional controls	No	Yes	No	Yes
Observations	216	204	108	105
Adj. <i>R</i> -squared	0.263	0.263	0.336	0.249

This table reports the OLS estimates of the relation between the development of PAOs and the informativeness of annual earnings announcements. The dependent variable is the country-level average *AbsCAR*, which is the mean of the firm-level absolute CAR around annual earnings announcements for each country-year. *PAO\_general* (*PAO\_Specific*) is the overall PAO measure based on the answers to all of the general (specific) questions on the IFAC questionnaire. *DISCLOSURE* is a stock exchange's enforcement of disclosure rules, *LEGPRO* is the overall rule of law and investor protection, and *ENGLISH* is an indicator variable equal to 1 if a country's legal system is based on English law. Please refer to Appendix 4 for more detailed variable definitions. Additional time-varying country-level control variables included in our model are GDP per capita, a variable measuring the openness of a country (i.e., international trade as a percentage of GDP), and inflation. The numbers in brackets are *p* values. \*\*\*, \*\*, and \* indicate that correlations are statistically significant at the 1, 5, and 10% levels, respectively

whether and to what extent our finding varies with other major country-level institutional characteristics. The results, presented in Table 10, show that the positive relationship between PAOs and stock market development is more pronounced in countries with higher levels of investor protection, stronger public enforcement environments, and lower levels of corruption. These are important findings, as they indicate that PAOs' effects on a country's stock market development are likely to be hampered if other institutional infrastructure is weak. In other words, it is important to take other complementary institutions into consideration when evaluating the relationship between the development of PAOs and stock market development.

In a fourth test, we control for country-level average education levels in our main empirical models. As we argue that better-trained, more ethical accountants facilitate better stock market development, a country's average

education level could be a correlated confounding factor. To address this concern, we follow Pevzner et al. (2013) and control for countries' average years of schooling among those older than 15 using data from the World Bank. Unreported tables show that our main results remain qualitatively the same after controlling for average education levels.

Our sample period begins in 2007. The widespread adoption of IFRS in 2005 is one of the most important developments in recent accounting history, and proponents of IFRS argue that it provides a single set of high-quality accounting standards. Accordingly, in a fifth additional test, we repeat our analysis using an expanded sample period spanning 2002–2012 to examine the robustness of our findings. This expanded sample period also offers an opportunity to examine whether the positive link we document varies by IFRS adoption (by examining the interaction term between PAOs and IFRS adoption). However, we find no evidence to suggest that such adoption affects that link.

In a sixth test, we address the concern of reverse causality. For example, a country's development of PAOs could be an outcome of better stock market development rather than the other way around, which could result in the positive relationship between PAOs and stock market development documented in our study. While it is difficult to obtain time-series data and we are unlikely to observe significant changes in PAO development during such a short period, we attempt to identify changes in country-level PAO development measures to better examine the causal effect of the development of PAOs on stock market development. To do this, we conduct a comprehensive search of each country included in our sample and collect information about the possible changes in the ethical, educational, and disciplinary dimensions during our sample period. We find only a few possible changes for our sample countries, such as the formation of a new monitoring committee in 2009 by ACCA and improved ethical requirements by PAOs in Australia and Belgium in 2011. However, we find no significant differences in the stock market development in any of these countries before the pre- and post-PAO-change period for any of these events. We attribute the inability to identify substantial changes in the stock market development of these countries following these events to the difficulty/subjectivity of defining *significant* changes regarding the development of PAOs in a country.

In a final test, instead of using the overall stock market development measure, we repeat our analysis using each of the five stock market development variables as the dependent variable, but our conclusions are unchanged. To further investigate the potential role of PAOs in a country, we extend our test on the relationship between the

**Table 8** Regression results (OLS): PAOs and stock market development: Big 4 auditors' market share-based measures

Dep. var.	<i>MARKDEV</i>			
	(1)	(2)	(3)	(4)
<i>PAO_big4share1</i>	0.396** [0.021]	0.421* [0.088]		
<i>PAO_big4share2</i>			0.520* [0.061]	0.132 [0.412]
<i>DISCLOSURE</i>	0.110* [0.054]	0.022 [0.789]	0.024 [0.801]	0.075 [0.195]
<i>LEGPRO</i>	0.290*** [0.000]	-0.032 [0.774]	0.241** [0.015]	-0.018 [0.817]
<i>ENGLISH</i>	0.293*** [0.001]	0.610*** [0.000]	0.600*** [0.000]	0.636*** [0.000]
Constant	-0.395** [0.011]	-1.082*** [0.000]	-0.494* [0.058]	-0.766*** [0.000]
Additional controls	No	Yes	No	Yes
Observations	216	204	216	204
Adj. <i>R</i> -squared	0.348	0.478	0.207	0.501

This table reports the OLS estimates of the relation between the development of PAOs and stock market development using alternative PAO measures. *MARKDEV* is overall stock market development. *PAO\_big4share1* (*PAO\_big4share2*) is the market share of Big 4 auditors in a country-year calculated based on total revenue (assets) of Big 4 auditors' client firms. *DISCLOSURE* is a stock exchange's enforcement of disclosure rules, *LEGPRO* is the overall rule of law and investor protection, and *ENGLISH* is an indicator variable equal to 1 if a country's legal system is based on English law. Please refer to Appendix 4 for more detailed variable definitions. Additional time-varying country-level control variables included in our model are GDP per capita, a variable measuring the openness of a country (i.e., international trade as a percentage of GDP), and inflation. The numbers in brackets are *p* values. \*\*\*, \*\*, and \* indicate that correlations are statistically significant at the 1, 5, and 10% levels, respectively

development of PAOs and the stock market to other measures of economic development, including access to capital, GNP, and the employment rate, as percentages of the population (all of these data are from the IMD database). Our results are generally consistent with the main finding documented in this study.

## Summary and Conclusion

This study examines the association between the development of PAOs in a given country and its level of stock market development in an international setting. We construct a comprehensive country-level measure of PAO development based on the responses to the questionnaire required by IFAC to assess the quality of PAOs worldwide. After controlling for investor protection, rule of law, legal origin, and the level of enforcement of the disclosure rules imposed by countries' stock exchanges, we identify a

significantly positive association between the development of PAOs and stock market development, which supports our hypothesis that the development of PAOs has a positive relation with better stock market development. Furthermore, we show that better-developed PAOs may contribute to a more vibrant stock market through the promotion of sound financial reporting practices. In addition, we find the positive association between PAOs and stock market development to be more pronounced in countries with higher levels of investor protection, stronger public enforcement environments, and lower levels of corruption. Finally, our result also shows that relative to the investigation and discipline mechanism and educational requirements imposed by PAOs, the ethical development of a country's professional accountants appears to have the strongest positive association with a country's stock market development.

The findings of this study are consistent with the view that ethical and well-educated accountants, in conjunction

**Table 9** Regression results (OLS): PAOs components and stock market development

Dep. var.	<i>MARKDEV</i>				
	(1)	(2)	(3)	(4)	(5)
<i>PAO_Ethics</i>	0.395*** [0.000]			0.464*** [0.000]	0.360*** [0.001]
<i>PAO_Education</i>		0.161* [0.080]		0.296*** [0.001]	0.311*** [0.001]
<i>PAO_Oversight</i>			0.160* [0.072]	0.212*** [0.009]	0.280*** [0.001]
<i>DISCLOSURE</i>	0.321*** [0.001]	0.328*** [0.001]	0.592*** [0.000]	0.680*** [0.000]	0.798*** [0.000]
<i>LEGPRO</i>	0.633*** [0.000]	0.486*** [0.000]	0.588*** [0.000]	0.530*** [0.000]	0.489*** [0.004]
<i>ENGLISH</i>	-0.163 [0.176]	-0.056 [0.625]	-0.173 [0.111]	-0.231** [0.033]	-0.340** [0.023]
Additional controls	No	No	No	No	Yes
Observations	108	108	108	108	105
Adj. <i>R</i> -squared	0.319	0.318	0.395	0.469	0.490

This table reports the OLS estimates of the relation between the three components of PAOs and stock market development using a partial sample of 18 countries with available PAO component data. The coefficients reported are standardized regression coefficients. *MARKDEV* is overall stock market development. *PAO\_Ethics*, *PAO\_Education*, and *PAO\_Oversight* are the mean scores of the answers in the ethics, education, and investigation and discipline dimensions of the PAOs, respectively. *DISCLOSURE* is a stock exchange's enforcement of disclosure rules, *LEGPRO* is the overall rule of law and investor protection, and *ENGLISH* is an indicator variable equal to 1 if a country's legal system is based on English law. Please refer to Appendix 4 for more detailed variable definitions. Additional time-varying country-level control variables included in our model are GDP per capita, a variable measuring the openness of a country (i.e., international trade as a percentage of GDP), and inflation. The numbers in brackets are *p* values. \*\*\*, \*\*, and \* indicate that correlations are statistically significant at the 1, 5, and 10% levels, respectively

with stringent oversight mechanisms established by PAOs internationally, are considered as important factors in financial reporting outcomes at the firm level, and also in the stock market development at the country level. This study thus has important implications for policymakers attempting to establish and maintain a high-quality accounting profession and well-developed stock market.

Although our findings are meaningful, several caveats must be noted. The study documents only an association between PAOs and stock market development; thus, we can draw no direct causal inferences about PAOs' effects on stock market development from its findings. Although we conduct an additional test to identify significant changes in the development of PAOs in our sample countries during our sample period to better examine the possible causal relationship between PAOs and stock market

development, given the intertwined relationships among country-level institutional variables, isolating the effect of PAOs from those of the other institutional variables remains difficult. Furthermore, although we include several time-varying country controls such as GDP per capita, inflation rate, and the global trade variable to measure the openness of a country in an additional test, we acknowledge the possibility that other country controls may also correlate with the PAO development measure of our study.

Finally, given the importance of PAOs for professional accountants in a given country in promoting ethical development, setting up educational requirements, and providing monitoring and oversight of members' professionalism, we believe that an important direction for future research would be to investigate the effectiveness of other institutions established to ensure the development of PAOs worldwide.



**Table 10** Cross-sectional tests: PAOs and stock market development—cross-country variations

<i>Interaction_Term</i>	<i>LEGPRO</i> (1)	<i>High_Public_Enforce</i> (2)	<i>Low_Corruption</i> (3)
<i>PAO_specific</i>	1.765*** [0.000]	1.446*** [0.005]	1.163*** [0.005]
<i>PAO_specific</i> × <i>Interaction_Term</i>	1.290** [0.018]	2.236** [0.020]	3.124*** [0.000]
<i>High_Public_Enforce</i>		−1.344* [0.084]	
<i>Low_Corruption</i>			−2.125*** [0.003]
<i>DISCLOSURE</i>	0.327*** [0.000]	0.269*** [0.000]	0.348*** [0.000]
<i>LEGPRO</i>	−0.507 [0.228]	0.383*** [0.000]	0.388*** [0.000]
<i>ENGLISH</i>	−0.219 [0.106]	−0.329** [0.014]	−0.310*** [0.009]
Constant	−1.428*** [0.000]	−1.290*** [0.004]	−1.027*** [0.005]
Observations	108	96	108
Adj. <i>R</i> -squared	0.477	0.617	0.671

This table reports the OLS estimates of the relation between the development of PAOs and stock market development across countries with different levels of investor protection, enforcement, and corruption. The dependent variable in all models is *MARKDEV*, which is overall stock market development. *PAO\_specific* is the overall PAOs measure based on the answers to all of the specific questions on the IFAC questionnaire. Country-level public enforcement is measured by the overall public enforcement index constructed by La Porta et al. (2006). *High\_Public\_Enforce* is an indicator variable that equals 1 if a country's score on the public enforcement index is higher than the median score for all countries. Country-level corruption is measured by ICRG, which is the average ICRG corruption index from 2003 to 2007. A higher ICRG index score means less corruption. *Low\_CORRUPTION* is an indicator variable measuring whether a country's level of corruption is lower than the median level of corruption for all countries. *DISCLOSURE* is a stock exchange's enforcement of disclosure rules, *LEGPRO* is the overall rule of law and investor protection, and *ENGLISH* is an indicator variable equal to 1 if a country's legal system is based on English law. Please refer to Appendix 4 for more detailed variable definitions. The numbers in brackets are *p* values. \*\*\*, \*\*, and \* indicate that correlations are statistically significant at the 1, 5, and 10% levels, respectively

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## Appendix 1: Professional Accountancy Organizations in the Sample Countries

Country	Professional accountancy organizations (PAOs)	
1 Argentina	Federación Argentina de Consejos Profesionales de Ciencias Económicas	1*
2 Australia	CPA Australia	
	Institute of Public Accountants	
	The Institute of Chartered Accountants in Australia	
3 Austria	Kammer der Wirtschaftstreuhänder	
4 Belgium	Institut des Réviseurs d'Entreprises	2*

Country	Professional accountancy organizations (PAOs)		Country	Professional accountancy organizations (PAOs)	
Belgium	Institut des Experts-comptables et des Conseils Fiscaux—Instituut Van de Accountants en de Belastingconsulenten (IEC-IAB)		29 South Korea	Korean Institute of Certified Public Accountants	15*
5 Brazil	Conselho Federal de Contabilidade (CFC)		30 Spain	Instituto de Censores Jurados de Cuentas de España	
6 Canada	The Canadian Institute of Chartered Accountants	3*	31 Sweden	Far	
Canada	Certified General Accountants Association of Canada		32 Switzerland	Treuhand-Kammer—Swiss Institute of Certified Accountants and Tax Consultants	16*
Canada	Certified Management Accountants of Canada		33 Taiwan	Federation of CPA Associations of Chinese Taiwan	
7 Chile	Colegio de Contadores de Chile		34 Thailand	Federation of Accounting Professions	
8 Denmark	FSR—danske revisorer		35 UK	Association of Accounting Technicians (AAT)	17*
9 Finland	HTM-tilintarkastajat—GRM—revisorer ry	4*	UK	The Institute of Chartered Accountants of Scotland	
10 France	Conseil Supérieur de l'Ordre des Experts-Comptables	5*	UK	The Institute of Chartered Accountants in England and Wales	
11 Germany	Wirtschaftsprüferkammer (WPK)	6*	UK	The Association of Chartered Certified Accountants	
12 Greece	Institute of Certified Public Accountants of Greece (SOEL)	7*	UK	Institute of Financial Accountants	
13 Hong Kong	Hong Kong Institute of Certified Public Accountants		UK	The Chartered Institute of Public Finance and Accountancy	
14 Indonesia	Indonesian Institute of Accountants or Ikatan Akuntan Indonesia (IAI)		UK	The Chartered Institute of Management Accountants (CIMA)	
15 Ireland	The Institute of Certified Public Accountants in Ireland	8*	36 USA	American Institute of Certified Public Accountants (AICPA)	18*
Ireland	Chartered Accountants Ireland				
Ireland	Accounting Technicians Ireland				
16 Israel	Institute of Certified Public Accountants in Israel				
17 Italy	Consiglio Nazionale dei Dottori Commercialisti e degli Esperti Contabili	9*			
18 Japan	The Japanese Institute of Certified Public Accountants	10*			
19 Luxembourg	Ordre des Experts-Comptables du Luxembourg	11*			
Luxembourg	Institut des Réviseurs d'Entreprises				
20 Malaysia	The Malaysian Institute of Certified Public Accountants	12*			
Malaysia	Malaysian Institute of Accountants				
21 Mexico	Instituto Mexicano de Contadores Públicos, A.C.				
22 Netherlands	Koninklijk Nederlands Instituut van Registeraccountants (Royal NIVRA)				
23 New Zealand	New Zealand Institute of Chartered Accountants				
24 Norway	Den Norske Revisorforening (DnR)				
25 Philippines	Philippine Institute of Certified Public Accountants				
26 Poland	National Chamber of Statutory Auditors	13*			
27 Singapore	Institute of Certified Public Accountants of Singapore				
28 South Africa	The South African Institute of Professional Accountants	14*			

This appendix presents the full list of the IFAC's PAO members for all 36 countries in our sample. The information is provided by IFAC. \* Indicates countries with no missing values for the PAOs' measures in our study. The 18 countries so marked constitute our partial sample, and all 36 countries form the full sample.

## Appendix 2: Measures of PAOs' Development

We construct country-level Professional Accountancy Organization (PAO) measures based on IFAC members' responses to the Assessment of the Regulatory and Standard-Setting Framework Questionnaire prepared by IFAC. All of IFAC's members are required to complete this questionnaire, which is included in the Statements of Membership Obligations (SMOs). IFAC designed this assessment questionnaire to collect information on the financial reporting and auditing regulatory and standard-setting framework in each PAO's jurisdiction and on the professional accountants represented by the organization. More specifically, the PAO measures are constructed on the basis of the following dimensions and information.

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**Overall Measures of PAOs**

**PAO\_general** is the average score of all six general questions (*PAO\_general (1)* to *PAO\_general (6)*), data on which are available for all 36 sample countries.

**PAO\_specific** is the average score of all specific questions (questions about PAOs' oversights (*ID1–ID8*), questions about PAOs' educational requirements (*ED1–ED11*), and question about PAOs' ethical requirements (*ET1–ET6*)), data on which are available for 18 of the sample countries.

We further separate the overall *PAO\_specific* measure into its three components to investigate the effect of each:

**(1) Requirements for investigation and discipline (*PAO\_Oversight*):** the average score of all eight specific questions on the requirements for investigation and discipline mechanisms (*ID1–ID8*).

**(2) Requirements for education (*PAO\_Education*):** the average score of all 11 specific questions on the requirements for the education of professional accountants (*ED1–ED11*).

**(3) Requirements for ethics (*PAO\_Ethics*):** the average score of all six specific questions on the ethical requirements for professional accountants (*ET1–ET6*).

**(A) Levels of investigation and discipline (ID)**

**Source:** A self-assessment questionnaire for IFAC member bodies on their compliance with IFAC Statements of Membership Obligations 6 (SMO 6).

**Description:** A measure of the compliance of each country's PAOs with IFAC requirements on mechanisms for investigating and disciplining (ID) professionals who fail to exercise and maintain professional standards and the related obligations. Each part of the questionnaire contains (1) general questions and (2) more specific questions related to the general questions. The possible scores for each question range from 0 to 1.

	Variable	Score
<b>General question (1)</b>		
(1) Is there a program for investigating and disciplining members of the organization for misconduct, including breaches of professional standards and rules?	<i>PAO_general (1)</i>	0/1
<b>Specific questions (ID1–ID8)</b>		
(1) Are there established provisions and processes for investigating and disciplining?	<i>(ID1)</i>	0/1
(2) Which of the following sanctions can be imposed? (A) Reprimand; (B) Loss or restriction of practice rights; (C) Fine/payment of costs; (D) Loss of professional title (designation); (E) Exclusion from membership; (F) Other. (According to the relative severity of the above sanctions, answers (D) or (E) or both score 1; answers including (B) but not (D) or (E) score 2/3; answers including (C) but not (B), (D), or (E) score 1/3; and answers only including (A) or (F) score 0.)	<i>(ID2)</i>	0–1
(3) Does the organization make members fully aware of all of the provisions of the ethical code and other applicable	<i>(ID3)</i>	0/1

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professional standards and requirements and the consequences of non-compliance?

(4) Is the organization obligated under local laws to report possible involvement in serious crimes and offenses by members to the appropriate public authority and to disclose related information to it? (*ID4*) 0/1

(5) Does the organization have all of the necessary powers for authorized personnel to carry out an effective investigation? (*ID5*) 0/1

(6) Does the organization maintain appropriate expertise and adequate financial and other resources to enable timely investigative and disciplinary action? (*ID6*) 0/1

(7) Does the organization confirm at the start of the investigation that any individual chosen to assist in an investigation is independent? (*ID7*) 0/1

(8) Does the tribunal responsible for the disciplinary hearing include a balance of professional expertise and outside judgment (e.g., a mix of accountants and non-accountants)? (*ID8*) 0/1

**(B) Educational requirements for professional accountants (ED)**

**Source:** A self-assessment questionnaire for IFAC member bodies concerning their compliance with IFAC Statements of Membership Obligations 2 (SMO 2).

**Description:** A measure of the compliance of each country's PAOs with international standards and other pronouncements issued by the International Accounting Education Standards Board (IAESB), an independent standard-setting body supported by IFAC. Each part of the questionnaire contains (1) general questions and (2) more specific questions related to the general questions. Possible scores for each question range from 0 to 1.

	Variable	Score
<b>General questions (2–5)</b>		
(2) Does the organization require individuals admitted as members to complete a professional accountancy education program?	<i>PAO_general (2)</i>	0/1
(3) Does the organization require individuals admitted as members to complete a practical experience requirement?	<i>PAO_general (3)</i>	0/1
(4) Does the organization require individuals admitted as members to complete a final assessment of professional capabilities?	<i>PAO_general (4)</i>	0/1
(5) Is there a requirement for members to maintain competence through continuous professional development (CPD)?	<i>PAO_general (5)</i>	0/1
<b>Specific questions (ED1–ED11)</b>		
(1) Does the education program have entry requirements that are at least equivalent to those for admission into a recognized university degree program?	<i>(ED1)</i>	0/1

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continued

(2) What is the length of the professional accountancy education? (A) less than two years; (B) two years; or (C) more than two years. (Answer (A) scores 0; answer (B) scores 1/2; answer (C) scores 1.)	(ED2)	0–1
(3) Which accounting and finance subjects are required in professional accountancy education? (A) Financial accounting; (B) Management accounting; (C) Control; (D) Taxation and financial management; (E) Business and commercial law; (F) Audit and assurance; (G) Finance (H) Professional values and ethics; or (I) None of the above. (Answers including all eight subjects score 1; answers including seven of the eight subjects score 7/8; answers including six of the eight subjects score 6/8, and so on; answer (I) scores 0.)	(ED3)	0–1
(4) Which organizational and business subjects are required in professional accountancy education? (A) Economics; (B) Business environment; (C) Corporate; (D) Business ethics; (E) Financial markets; (F) Quantitative methods; (G) Organizational governance behavior; (H) Management and strategic decision making; (I) Marketing; (J) International business and globalization; or (K) None of the above. (Answers including all ten subjects score 1; answers including nine of the ten subjects score 9/10; answers including eight of the ten subjects score 8/10, and so on; answer (K) scores 0.)	(ED4)	0–1
(5) Does professional accountancy education cover values, ethics and attitudes?	(ED5)	0/1
(6) Is practical experience required with approved employers?	(ED6)	0/1
(7) What is the required length of practical experience? (A) less than three years; (B) three years; or (C) more than three years. (Answer (A) scores 0; answer (B) scores 1/2; answer (C) scores 1.)	(ED7)	0–1
(8) Is the period of practical experience monitored?	(ED8)	0/1
(9) Does the organization require members to complete a final assessment of an individual's professional capabilities?	(ED9)	0/1
(10) Is there a process to monitor whether professional accountants meet the CPD requirements?	(ED10)	0/1
(11) Are sanctions such as expulsion or denial of the right to practice imposed when professional accountants do not meet CPD requirements?	(ED11)	0/1

### (C) Ethical requirements for professional accountants (ET)

**Source:** A self-assessment questionnaire for IFAC member bodies regarding their compliance with IFAC Statements of Membership Obligations 4 (SMO 4).

continued

**Description:** Measures of the compliance of each country's PAOs with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants (IESBA), an independent standard-setting body supported by IFAC. Each part of the questionnaire contains (1) general questions and (2) more specific questions related to the general questions. Possible scores for each question range from 0 to 1.

	Variable	Score
<b>General question (6)</b>		
Are there established ethical requirements for members?	PAO_general (6)	0/1
<b>Specific questions (ET1–ET6)</b>		
(1) Do the ethical requirements require professional accountants to comply with the fundamental principle of “integrity” as described in the IFAC Code?	(ET1)	0/1
(2) Do the ethical requirements require professional accountants to comply with the fundamental principle of “objectivity” as described in the IFAC Code?	(ET2)	0/1
(3) Do the ethical requirements require professional accountants to comply with the fundamental principle of “professional competence and due care” as described in the IFAC Code?	(ET3)	0/1
(4) Do the ethical requirements require professional accountants to comply with the fundamental principle of “confidentiality” as described in the IFAC Code?	(ET4)	0/1
(5) Do the ethical requirements require professional accountants to comply with the fundamental principle of “professional behavior” as described in the IFAC Code?	(ET5)	0/1
(6) Are there specific requirements and guidance to assist members in identifying and resolving ethical issues?	(ET6)	0/1

## Appendix 3: General Questions and Answers

Country	Professional accountancy organizations	<i>PAO_general</i> (1) Oversight Is there a program for investigating and disciplining members for misconduct? Yes = 1; No = 0	<i>PAO_general</i> (2) Education Does the organization require members to complete professional accountancy education? Yes = 1; No = 0	<i>PAO_general</i> (3) Education Does the organization require members to complete a practical experience requirement? Yes = 1; No = 0	<i>PAO_general</i> (4) Education Does the organization require members to complete a final assessment? Yes = 1; No = 0	<i>PAO_general</i> (5) Education Does the organization require members to maintain competence through CPD? Yes = 1; No = 0	<i>PAO_general</i> (6) Ethics Are there established ethical requirements for members? Yes = 1; No = 0
Argentina	Federación Argentina de Consejos Profesionales de Ciencias Económicas	1	1	0	0	0	1
Australia	CPA Australia	1	1	1	1	1	1
Australia	Institute of Public Accountants	1	1	1	1	1	1
Australia	The Institute of Chartered Accountants in Australia	1	1	1	1	1	1
Austria	Kammer der Wirtschaftstreuhänder	1	0	1	1	1	1
Belgium	Institut des Réviseurs d'Entreprises	1	0	1	1	1	1
Belgium	IEC-IAB	1	0	1	1	1	1
Brazil	Conselho Federal de Contabilidade (CFC)	1	1	0	0	1	1
Canada	The Canadian Institute of Chartered Accountants	1	1	1	1	1	1
Canada	Certified General Accountants Association of Canada	1	1	1	1	1	1
Canada	Certified Management Accountants of Canada	1	1	1	1	1	1
Chile	Colegio de Contadores de Chile	1	1	0	0	0	1
Denmark	FSR—danske revisorer	1	1	1	1	1	1
Finland	HTM-tilintarkastajat—GRM—revisorer ry	0	1	1	1	1	1
France	Conseil Supérieur de l'Ordre des Experts-Comptables	1	1	1	1	1	1
Germany	Wirtschaftsprüferkammer (WPK)	1	0	1	1	1	1
Greece	Institute of Certified Public Accountants of Greece (SOEL)	1	1	1	1	0	1
Hong Kong	Hong Kong Institute of Certified Public Accountants	1	1	1	1	1	1
Indonesia	Indonesian Institute of Accountants or Ikatan Akuntan Indonesia (IAI)	1	1	0	1	1	1
Ireland		1	1	1	0	1	1



Country	Professional accountancy organizations	<i>PAO_general</i> (1) Oversight Is there a program for investigating and disciplining members for misconduct? Yes = 1; No = 0	<i>PAO_general</i> (2) Education Does the organization require members to complete professional accountancy education? Yes = 1; No = 0	<i>PAO_general</i> (3) Education Does the organization require members to complete a practical experience requirement? Yes = 1; No = 0	<i>PAO_general</i> (4) Education Does the organization require members to complete a final assessment? Yes = 1; No = 0	<i>PAO_general</i> (5) Education Does the organization require members to maintain competence through CPD? Yes = 1; No = 0	<i>PAO_general</i> (6) Ethics Are there established ethical requirements for members? Yes = 1; No = 0
Ireland	Chartered Accountants Ireland	1	1	1	1	1	1
Ireland	Accounting Technicians Ireland	1	1	1	0	0	1
Israel	Institute of Certified Public Accountants in Israel	1	1	1	1	0	1
Italy	Consiglio Nazionale dei Dottori Commercialisti e degli Esperti Contabili	1	1	1	1	1	1
Japan	The Japanese Institute of Certified Public Accountants	1	1	1	1	1	1
Luxembourg	Ordre des Experts-Comptables du Luxembourg	1	1	1	1	1	1
Luxembourg	Institut des Réviseurs d'Entreprises	1	1	1	1	1	1
Malaysia	The Malaysian Institute of Certified Public Accountants	1	1	1	1	1	1
Malaysia	Malaysian Institute of Accountants	1	1	1	0	1	1
Mexico	Instituto Mexicano de Contadores Públicos, A.C.	1	1	0	0	1	1
Netherlands	Koninklijk Nederlands Instituut van Registeraccountants (Royal NIVRA)	1	1	1	0	1	1
New Zealand	New Zealand Institute of Chartered Accountants	1	1	1	1	1	1
Norway	Den Norske Revisorforening (DnR)	1	1	1	1	1	1
Philippines	Philippine Institute of Certified Public Accountants	1	1	0	1	1	1
Poland	National Chamber of Statutory Auditors	1	1	1	1	1	1
Singapore	Institute of Certified Public Accountants of Singapore	1	1	1	1	1	1

Country	Professional accountancy organizations	<i>PAO_general</i> (1) Oversight Is there a program for investigating and disciplining members for misconduct? Yes = 1; No = 0	<i>PAO_general</i> (2) Education Does the organization require members to complete professional accountancy education? Yes = 1; No = 0	<i>PAO_general</i> (3) Education Does the organization require members to complete a practical experience requirement? Yes = 1; No = 0	<i>PAO_general</i> (4) Education Does the organization require members to complete a final assessment? Yes = 1; No = 0	<i>PAO_general</i> (5) Education Does the organization require members to maintain competence through CPD? Yes = 1; No = 0	<i>PAO_general</i> (6) Ethics Are there established ethical requirements for members? Yes = 1; No = 0
South Africa	The South African Institute of Professional Accountants	1	1	1	1	1	1
South Korea	Korean Institute of Certified Public Accountants	1	1	1	1	1	1
Spain	Instituto de Censores Jurados de Cuentas de España	1	1	1	1	1	1
Sweden	Far	1	1	1	1	1	1
Switzerland	Treuhand-Kammer-Swiss Institute of Certified Accountants and Tax Consultants	1	1	1	1	1	1
Taiwan	Federation of CPA Associations of Chinese Taiwan	0	1	1	1	1	1
Thailand	Federation of Accounting Professions	1	1	1	1	0	1
UK	Association of Accounting Technicians (AAT)	1	0	1	1	1	1
UK	The Institute of Chartered Accountants of Scotland	1	1	1	1	1	1
UK	The Institute of Chartered Accountants in England and Wales	1	1	1	1	1	1
UK	The Association of Chartered Certified Accountants	1	1	1	1	1	1
UK	Institute of Financial Accountants	1	1	1	0	1	1
UK	The Chartered Institute of Public Finance and Accountancy	1	1	1	1	1	1
UK	The Chartered Institute of Management Accountants (CIMA)	1	1	1	1	1	1
USA	AICPA	1	1	1	1	1	1

This appendix tabulates each PAO's responses to all six general questions. To obtain *PAO\_general*, we first average the four education questions to a score between 0 and 1, and we then compute the mean score of the three major PAO components, including (1) investigation and discipline (Oversight), (2) educational requirements (Education), and (3) ethical requirements (Ethics). The weights for the three components are the same when calculating *PAO\_general*. For example, Thailand has one PAO. We first compute an Education score by averaging Thailand's scores on the four education questions, that is,  $(1 + 1 + 1 + 0)/4 = 0.75$ . We then compute *PAO\_general* as the mean score of the three PAO components, Oversight, Education, and Ethics:  $(1 + 0.75 + 1)/3 = 0.92$ . For countries with more than one PAO, we average the *PAO\_general* score for each of the PAOs in a country to obtain the overall country-level measure of PAOs development.

## Appendix 4: Variable Definitions

### Stock market development variables

<i>MARKDEV</i>	Overall stock market development measured as the mean of the following five standardized market development variables covering the 2007–2012 period
(1) <i>STC</i>	Stock market capitalization relative to GDP for the 2007–2012 period; obtained from IMD WORLD COMPETITIVENESS
(2) <i>STC_MIN</i>	Stock market capitalization held by minority shareholders deflated by GDP for the 2007–2012 period. Market capitalization held by minority shareholders is computed as the product of a stock exchange's market capitalization (in US\$ billion) and the average percentage of common shares not owned by the top three shareholders in the 10 largest non-financial privately owned domestic listed firms. Stock market capitalization is obtained from IMD WORLD COMPETITIVENESS, and the percentage of shares not owned by the top three shareholders is obtained from the Capital IQ Compustat Database
(3) <i>N_LIST</i>	Number of listed domestic companies deflated by population (in millions) for the 2007–2012 period; obtained from IMD WORLD COMPETITIVENESS
(4) <i>N_NEWLIST</i>	Number of newly listed domestic companies deflated by population (in millions) for the 2007–2012 period; obtained from IMD WORLD COMPETITIVENESS
(5) <i>TRADE</i>	Per-capita annual value traded on the stock market (in US\$) for the 2007–2012 period; obtained from IMD WORLD COMPETITIVENESS

### Professional accountancy organizations (PAOs) variables—from IFAC

<i>PAO_general</i>	Overall country-level PAO measure based on the responses of International Federation of Accountants (IFAC) member countries to all of the <i>general questions</i> included in the questionnaire (Assessment of the Regulatory and Standard-Setting Framework Questionnaire) designed by IFAC to assess the level of development of a country's PAOs. See Appendix 2 for more details on the measure and general questions. Data are available for all 36 sample countries
<i>PAO_specific</i>	Overall country-level PAOs measure based on the responses of IFAC member countries to all of the <i>specific questions</i> included on the questionnaire (Assessment of the Regulatory and Standard-Setting Framework Questionnaire) designed by IFAC to assess the level of development of a country's PAOs. See Appendix 2 for more details on the measure and specific questions. Data are available for 18 sample countries

<i>PAO_Oversight</i>	The investigation and discipline dimension of the PAOs measure, which is calculated as the average score of all answers to the specific questions in the investigation and discipline part of the IFAC questionnaire. It captures the compliance of a country's PAOs with IFAC requirements for mechanisms that investigate and discipline professionals who fail to exercise and maintain professional standards and related obligations
<i>PAO_Education</i>	The education dimension of the PAOs measure, which is calculated as the average score of all of the answers to the specific questions in the education part of the IFAC questionnaire. It captures the compliance of a country's PAOs with international standards and other pronouncements issued by the International Accounting Education Standards Board (IAESB), an independent standard-setting body supported by IFAC
<i>PAO_Ethics</i>	The ethics dimension of the PAOs measure, which is calculated as the average score of all of the answers to the specific questions in the ethics part of the IFAC questionnaire. It captures the compliance of a country's PAOs with the code of ethics for professional accountants issued by the International Ethics Standards Board for Accountants (IESBA), an independent standard-setting body supported by IFAC
<i>PAO_big4share1(2)</i>	Market share of Big 4 auditors in a country-year calculated as the total revenue (assets) of firms audited by Big 4 auditors divided by the total revenue (assets) of all firms in each country-year. Big 4 auditor data are from the Capital IQ Compustat Database
Earnings management variables	
<i>SMOOTH_sd</i>	Median ratio of firm-level standard deviations of operating income and operating cash flow for each country-year. Operating income and operating cash flow are both scaled by total assets at the beginning of the year. The measure is multiplied by $-1$ such that a higher value means more smoothing and lower earnings quality. All data are from the Capital IQ Compustat Database
<i>SMOOTH_corr</i>	Spearman correlation between a change in accruals and change in cash flow from operations for a country-year. The change in accruals and cash flow from operations are both scaled by total assets at the beginning of the year. The measure is multiplied by $-1$ such that a higher value means more smoothing and lower earnings quality. All data are from the Capital IQ Compustat Database

## Restatement variable

*RESTATE* The ratio of total observations with restated financial statements to the total number of observations in each country-year. Restatement data are from the Capital IQ Compustat Database

## Informativeness of annual earnings announcement variable

*AbsCAR* Mean of firm-level absolute CAR around the annual earnings announcements for each country-year. Firm-level absolute CAR is the absolute value of the two-day market-adjusted cumulative return in percentage form during the [0, +1] window, where day 0 is the annual earnings announcement date. All data are from the Capital IQ Compustat Database

## Other country-level variables

*DISCLOSURE* Measure of a stock exchange's enforcement of disclosure rules constructed by Frost et al. (2006). It measures the extent to which disciplinary actions are enforced by a stock exchange when listed firms issue false financial statements and misleading material announcements

*LEGPRO* Overall rule of law and investor protection in each country calculated as the mean of the seven following standardized rule of law and investor protection variables

(1) *RL\_F* Legal structure and property rights, including judicial independence, impartial courts, protection of property rights, military interference in the rule of law and politics, integrity of the legal system, legal enforcement of contracts, regulatory restrictions on the sale of real property, reliability of the police, and the business costs of crime. Data source: "Economic Freedom of the World" issued by the Fraser Institute; see [http://www.freetheworld.com/datasets\\_efw.html](http://www.freetheworld.com/datasets_efw.html)

(2) *RL\_H* Rule of law, including property rights (i.e., recognition of private property rights and an effective rule of law to protect them, which are vital features of a fully functioning market economy) and freedom from corruption (i.e., the failure of integrity in the economic system, a distortion by which individuals or special-interest groups are able to gain at the expense of the whole). Data source: "Index of Economic Freedom" issued by the Heritage Foundation and Wall Street Journal; see <http://www.heritage.org/index/explore?view=by-region-country-year>

(3) *RL\_W* A rule of law measure that captures perceptions of the extent to which agents have confidence in and abide by the rules of society and the quality of contract enforcement, property rights, the police, and the courts, along with the likelihood of crime and violence. Data source: "Worldwide Governance Indicators" published by the World Bank; see <http://info.worldbank.org/governance/wgi/index.aspx#reports>

(4) *IP* Strength of investor protection index. Data source: "Doing Business Indicators" issued by the International Finance Corporation and World Bank; see <http://www.doingbusiness.org/custom-query>

(5) *SR* Sufficient protection of shareholders' rights. Data source: "World Competitiveness Yearbook" issued by the International Institute for Management Development (IMD); see <https://www.worldcompetitiveness.com/OnLine/App/Index.htm>.

(6) *MIP\_G* Protection of minority shareholders' interests. Data source: "Global Competitiveness Index" issued by the World Economic Forum; see <http://www.weforum.org/issues/competitiveness-0/gci2012-data-platform>

(7) *IP\_G* Strength of investor protection. Data source: "Global Competitiveness Index" issued by the World Economic Forum; see <http://www.weforum.org/issues/competitiveness-0/gci2012-data-platform>

*ENGLISH* English common law: an indicator variable equal to 1 if a country's legal system is patterned on English law and 0 otherwise. Data source: La Porta et al. (2006)

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