Institutional characteristics, signaling variables and IPO initial returns

A study on OECD countries

Sheela Devi D. Sundarasen
Prince Sultan University, Riyadh, Saudi Arabia

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Abstract

Purpose – This paper aims to provide empirical evidence on the extent of alteration institutional characteristics, i.e. legal origin and corruption levels, may have on the signaling effects of auditors' reputation, underwriters' reputation and ownership retention on initial public offering (IPO) initial returns in OECD countries.

Design/methodology/approach – Cross-sectional data composed of 6,182 IPOs from 30 OECD countries are used for 2003-2012. Ordinary least square with multiple linear regressions is used to test the hypotheses.

Findings – The findings indicate that the legal framework and corruption level of a country alters the signaling effects of underwriters' reputation, auditors' reputation and ownership retention in an IPO environment. These three variables mitigate information asymmetry, signal firm value to potential investors and ultimately decrease IPO initial returns. This relationship is more significant in the civil law countries. Corruption levels negatively moderate the relationship in the common law and Scandinavian civil law countries but have no significance in the German and French civil law countries, indicating the importance of the signaling variables in these two civil law countries.

Originality/value – This study examines the extent of the alterations that the legal framework and the corruption levels cause to the signaling relationship between auditors' reputation, underwriters' reputation and ownership retention on IPO initial returns in selected OECD countries.

Keywords IPO, Legal origin, Auditors' reputation, Corruption level, Ownership retention, Underwriters' reputation

Paper type Research paper

Introduction

The variations in the environment of initial public offerings (IPOs) principally originate from the differences between an IPO's offer price and its first-day closing price (Ibbotson *et al.*, 1988; Ritter, 1998), which is known as *initial return*[1]. IPOs have long been a subject of debate and substantial interest among researchers because of the internal (firm-specific) and external uncertainties surrounding the IPO environment. Uncertainty has been documented as being at the heart of an IPO process (Ljungqvist, 2007), which contributes significantly to

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the volatility in IPO initial returns across the globe. This study revisits the uncertainty issue in a global context using three signaling variables (auditors' reputation, underwriters' reputation, and ownership retention). The main motivation of this study is the exploration of the IPO uncertainty issue from the perspectives of institutional characteristics (legal origin and corruption levels).

Most of the extant literature in this area merely explains the possible reasons and underlying theories for the relationships between the abovementioned signaling variables and IPO initial returns; none has incorporated the *alterations* that institutional characteristics may create in these relationships. The novel contribution of this study is to fill this gap in the literature and offer important insights to firm owners, fund managers, and investors. Revisiting the issue within the context of institutional characteristics is particularly timely because global capital markets have become more integrated. Firm owners are seeking for opportunities to raise capital in multiple capital markets, while international investors and fund managers, by contrast, are penetrating markets to carefully select financial products that can maximize returns. It is thus predicted that the quality of the legal framework and the corruption levels of a country have an impact on the extent to which the auditors' reputation, underwriters' reputation, and ownership retention can signal firm quality.

Our study is motivated by Engelen and Van Essen (2010), Banerjee *et al.* (2011) and Hopp and Dreher (2013), who examined IPO underpricing in an international setting. They explored the *direct relationship* between country-level information asymmetry, effective contract enforcement (a reflection of the legal framework), investors' protection/increased protection to shareholders, and transparency levels (from the perspectives of accounting disclosures) on IPO initial returns. The present study is distinguished in the following respects. First, it examines the *strength* in the relationship between the signaling variables, i.e. underwriters, auditors and ownership retention and IPO initial returns in the context of common law and civil law countries. Aforementioned studies examined the *direct relationships* between legal and institutional characteristics on IPO underpricing. Second, this study examines the moderation effects of a country's corruption level (proxied by the Corruption Perception Index [CPI]) on the relationship between the signaling variables and IPO initial returns in both common law and civil law countries. The study relies on the "perceived level of public sector corruption," and it is conjectured that corruption levels may alter the roles of the signaling variables on IPO initial returns because of the "invisible hand" interfering in the normal course of business. Here again, the moderation effect of corruption on the relationship between the signaling variables and IPO initial returns is expected to vary between the common and civil law countries. Studies by Engelen and Van Essen (2010), Banerjee *et al.* (2011) and Hopp and Dreher (2013) justifies the *direct* relationship between the institutional variables and IPO underpricing. Nevertheless, the current study contributes to the extant literature in a more nuanced manner, i.e. examining the strength of the relationship between the signaling variables and IPO initial returns within different institutional context. Consequently, this study is keen to examine the roles played by underwriters, auditors and IPO firm owners in different institutional context, which could ultimately benefit IPO firms, investors and regulators.

Ibbotson (1975), Ibbotson and Jaffe (1975), Ritter (1984) and Beatty and Ritter (1986) were pioneers in IPO research who predominantly examined the presence of and the contributing factors to IPO underpricing. Leland and Pyle (1977), Kahneman and Tversky (1979), Rock (1986), Tinic (1988) and Welch (1989) have also significantly contributed to the emergence of the underlying theories of IPO underpricing. Over the last decade, a considerable body of literature has documented the relationship between institutional factors, such as legal

origins, investors' protection, corporate governance, corruption levels, political connections, and rules and regulations, and the impact on IPO initial returns. La Porta *et al.* (1998, 1999, 2002, 2007) are the authority in the area of law and finance. They highlighted the importance of the legal framework as the key mechanism to understand the patterns of corporate finance. This study will further consolidate the extant literature within the boundaries of institutional arrangements, as raising capital is increasingly borderless and institutional characteristics have become a crucial factor for all stakeholders in their respective decision-making.

In line with that, this study reports several important findings. As suggested by the signaling hypothesis and the information asymmetry model, the signaling variables represented by underwriters' reputation, auditors' reputation, and ownership retention do have an impact on IPO initial returns in both the common law and civil law countries. However, the strength of the relationship is stronger in the civil law countries, indicating that the signaling variables have a more powerful effect in the civil law countries because of the legal structure. Our empirical evidence also suggests that the corruption levels of a country negatively moderate the above relationship in the common law and Scandinavian civil law countries but have no significance in the German and French civil law countries, except for underwriters' reputation. This could be a reflection of low corruption, low government intervention, and a higher level of enforcement of rules and regulations by regulators in common law and Scandinavian civil law countries, which ultimately reduces the importance of the signaling variables when corruption is low.

The above findings contribute to the existing IPO literature, and the outcomes present several practical implications. As has been widely documented, reputable underwriters/auditors and high ownership retention reduce IPO initial returns, which is a reflection of low information asymmetry and *ex ante* uncertainty, contributing to low pricing error. Minimizing pricing error also means that issuers are "leaving less money on the table" from floatation. This may assist *issuers* in their listing decision, especially in civil law countries because reputable underwriters/auditors and high ownership retention could assist issuers to lower their cost of capital. Issuers in both the common law and civil law countries may capitalize on the reputation capital of the underwriters and auditors and their affiliation with reputable analysts when deciding to float their company. These signaling variables tend to rapidly increase investors' confidence and IPO investment decisions and to certain extent, ensure the success of the entire IPO endeavor. As legal origin plays a dominant role in the relationships between the signaling variables and the IPO initial returns, *investors* can independently diversify their IPO portfolio (according to their risk preference) by investing in foreign stock exchanges. Different legal origins have differing levels of legal protection and degree of institutional execution, and this affects the performance of IPOs. In terms of regulation, priority should be given to reforming the country-level legal and institutional framework and its enforcement. Government and regulators should also intensify their efforts to combat corruption, as this can be detrimental to the long-term sustainability of a country's economic and social environment. Low corruption levels coupled with a more structured legal framework reduces perceived risks associated with financial markets, thus creating a deeper financial market for investors and international companies wanting to float their IPOs. All these factors put together will ultimately boost the capital market and the sustainability of an economy.

The rest of the paper is structured as follows. Section 2 discusses the hypothesis development. Section 3 presents the data, methodology and discussion of the variables. Section 4 presents the empirical results and discussion, and Section 5 concludes.

Hypothesis development

Background

The Organization for Economic Cooperation and Development (OECD) was officially established on September 30, 1961. In all, 35 member countries span the globe (there were only 34 members during the period of this study), extending from North and South America to Europe and the Asia-Pacific. Brazil, India, the People's Republic of China, Indonesia, and South Africa are the key partners of the Organization; these countries account for 80 per cent of world trade and investment, rendering OECD a good database to study.

The OECD countries examined in this study include common law (Australia, Canada, Ireland, New Zealand, Israel, the UK and the USA) and civil law (Austria, Belgium, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Italy, Japan, Mexico, Norway, The Netherlands, Poland, Portugal, South Korea, Spain, Sweden, Switzerland, and Turkey) countries. Four countries (Hungary, Slovakia, Slovenia, and Luxembourg) are dropped from the analysis because of the unavailability of data. Table I gives a brief summary of the number of IPOs, initial returns and the CPIs for the respective countries.

A total of 6,182 IPO companies were used in the analysis, with 57 per cent being from the common law countries and 43 per cent being from the non-common law countries. The highest number of IPOs for the study period (2003-2012) is derived from the USA, constituting 22.8 per cent of the total companies studied. As for the initial returns, underpricing varies dramatically across countries; it ranges from a positive 61.34 per cent in Japan to a negative 89.77 in Israel. In the common law countries, the USA, U.K, Australia and Canada had the highest number of IPOs during the period of study. The mean initial returns were relatively stable amongst the common law countries, with the exception of Israel (−89.77 per cent). As for the Civil Law countries, Japan and South Korea had a relatively high number of IPOs. The mean initial returns were quite varied, ranging from a positive initial return of 61.34 per cent in Japan to a negative return of 30.89 per cent in Turkey.

The corruption levels of a given country fluctuate in the range of one point over the study period, with the exception of the USA, Poland, and Turkey, where the fluctuation is relatively higher. The corruption levels are lower among common law countries relative to civil law countries, ranging from 5.9-6.1 (Israel) to 9.4-9.6 (New Zealand). Within the civil law countries, the Scandinavian civil law countries (Finland, Denmark, Sweden and Norway) have low corruption levels, ranging from 8.6-9.6 (Norway) to 9.4-9.7 (Finland). Broadly, within the German civil law countries, Poland, Turkey, Czech Republic, Greece, South Korea, Estonia, Italy, and Portugal, have relatively higher corruption levels, while Iceland, Switzerland, Austria, Belgium, Germany, Chile and Japan have lower corruption levels. Corruption levels are also low in the French Civil Law countries, with the exception of Mexico. These statistics warrant a detailed analysis on the extent of the influence that the corruption level of a country may have on the relationship between the signaling variables used in this study and IPO initial returns.

The following section briefly revisits the literature pertaining to the relevant signaling variables and IPO initial returns.

Underwriters' reputation and initial public offerings' initial returns

Underwriters' reputation has an impact on IPO initial returns because of underwriters' active involvement in rendering fundamental services in the IPO process, such as legal, administration, certification, market building, and pricing services. Prestigious underwriters offer a wealth of experience in taking companies public and have a reputation for

Country	No. of IPOs	Initial returns	CPI
Common Law			
New Zealand	32	12.60	9.4-9.6
Australia	915	15.06	8.5-8.7
Canada	320	16.42	8.4-8.9
UK	800	12.62	7.6-8.7
Ireland	25	35.94	7.4-7.5
USA	1410	8.46	7.1-8.7
Israel	44	−89.77	5.9-6.1
German Civil Law			
Iceland	16	−16.47	9.4
Switzerland	46	25.6	8.7-9.1
Austria	28	4.99	7.8-8.7
Belgium	64	12.2	7.5-7.7
Germany	188	11.17	7.3-8.2
Chile	28	5.80	7.3-8
Japan	676	61.34	6.9-7.8
Estonia	12	5.01	6.4-6.7
Portugal	7	−7.26	5.8-6.6
Italy	104	17.99	4.8-5.3
South Korea	560	14.25	4.3-5.6
Greece	52	8.03	4.2-4.7
Czech Republic	5	9.37	4.2-4.6
Turkey	52	−30.89	3.1-4.6
Poland	186	5.18	3.4-5.3
Scandinavian Civil Law			
Finland	18	5.16	9.4-9.7
Denmark	20	−0.16	9.3-9.4
Sweden	44	16	9.2-9.3
Norway	146	14.16	8.6-9.6
French Civil Law			
Netherland	72	8.56	8.2-8.4
Spain	39	5.70	6.1-7.1
France	238	11.48	6.8-7.5
Mexico	35	6.35	3.3-3.6

Notes: Corruption Perceptions Index (CPI) shows the annual ranking of countries "by their perceived levels of corruption. The Corruption Perceptions Index aggregates data from a number of different sources that provide perceptions of business people and country experts of the level of corruption in the public sector. The CPI generally defines corruption as "the misuse of public power for private benefit". The CPI is scaled "on a scale from 10 (very clean) to 0 (highly corrupt)"; Data Source for CPI: Transparency International (www.transparency.org/)

Table I.
IPOs (by legal origin), mean initial returns and CPI of selected OECD countries for the period 2003-2012

effectiveness. These factors serve as a positive signal to potential investors about the future prospects and value of a company.

A substantial body of relevant research found a negative relationship between underwriters' reputation and IPO initial returns (Beatty and Ritter, 1986; Carter and Manaster, 1990; Carter *et al.*, 1998; Johnson and Miller, 1988; Aggarwal and Conroy, 2000; Kirkulak and Davis, 2005). However, Beatty and Welch (1996) reported a positive relationship between underwriters' reputation and IPO initial returns, and they suggested that the behavior and preference of underwriters have changed in the 1990s and thereafter

because of economic conditions, structural changes in the USA market after the tech boom, emphasis on analyst coverage, etc. Cooney *et al.* (2001) and Bates and Dunbar (2002) supported this phenomenon. Influential underwriters tend to inspire greater coverage from analysts for an IPO, which has significantly contributed to demand for IPOs and initial returns (Beatty and Welch, 1996; Loughran and Ritter, 2002; Liu and Ritter, 2011).

Underwriters are critical within the IPO environment. Although initial studies found a negative relationship between underwriters' reputation and IPO initial returns, trends have changed since the 1990s. Reputable underwriters still represent firm quality, but investors now view this as an opportunity to increase their demand for these IPOs on the first day, thus forcing prices to move upward and contributing to higher initial returns. Regardless of the positive or negative relationship, it is established that underwriters' reputation signals to the potential investors about firm value.

Auditors' reputation and initial public offerings' initial returns

When companies go public, they nominate external auditors to undertake a due diligence audit and publish the reports for potential investors to decide about the prospects of these companies. These audited reports partially resolve the information asymmetry between issuers and the investors. Consistent with the premise that high-quality auditors will reduce uncertainty surrounding the IPOs and bridge the asymmetric information gap, the literature documents a negative association between auditors' reputation and initial returns. Research by Titman and Trueman (1986) represents one of the major breakthroughs in this context. These authors found that the quality of the auditors has a direct relationship with the quality of the entrepreneur's private information. Therefore, low-risk firms are associated with reputable auditors, which sends a positive signal on the quality of information provided in the prospectus, reducing the uncertainty between the issuers and the potential investors.

Datar *et al.* (1991), consistent with Hughes (1986), did not fully concur with the results by Titman and Trueman (1986). Datar *et al.* (1991) posit that the entrepreneur's retained ownership could resolve the remaining uncertainty in the IPO environment. They documented that reporting characteristics (disclosure and auditor choice) provided no additional information about a firm's future market value and viewed the auditing as an attestation. Engaging a high-quality auditor only reduces the likelihood of material misrepresentation in the information provided by the entrepreneurs in the prospectus.

However, evidence provided by Simunic and Stein (1987), Beatty (1989) and Michaely and Shaw (1995) was in line with the results from Titman and Trueman. Similarly, Albring *et al.* (2007) conjectured that the choice of audit firms is important because the auditors' reputation may influence IPO pricing. Wang and Wilkins (2007), whose empirical evidence showed that IPOs audited by the Big 6 (at the time) firms experienced significantly less underpricing than IPOs audited by other firms, further supported this. At the empirical level, much of the USA-based research produced results that were more in agreement with the predictions of Titman and Trueman (1986) than Datar *et al.* (1991) Simunic and Stein (1987), Beatty (1989) and Feltham *et al.* (1991).

Ownership retention and initial public offerings' initial returns

The final signaling variable in our analysis is ownership retention, which refers to the amount of shares retained by the original owners of the IPOs. Leland and Pyle (1977) analyzed the asymmetric information between issuers and investors and conjectured that entrepreneurs can increase the market value of their firms by retaining a higher fraction of ownership. Since owners of high-performing firms will retain more equity than those of

poorly performing firms, ownership retention offers valuable insights to prospective investors about the true quality of a firm. High ownership retention is theorized to be a signal to investors of the company's credibility and future prospects. Retained equity signals greater confidence by the issuers in the firm's future prospects and may help to mitigate the information asymmetry between the issuers and the potential investors. This signal prompts investors to increase demand for the shares on the first day of trading, causing the price to move upward. Similar results were documented by Downes and Heinkel (1986), Allen and Faulhaber (1989), Grinblatt and Hwang (1989) and Welch (1989). Firth and Liau-Tan (1997), Howton *et al.* (2001), Bradley and Jordan (2002), Ritter and Welch (2002) and Roosenboom and van der Goot (2005) also presented similar findings.

However, the bivariate signaling model by Hughes (1986) contradicts the above findings and indicates a substitution effect that reflects a tradeoff between the two signals (ownership retention and underpricing), depending on the relative marginal costs and benefits. According to Hughes (1986), the greater the fractional insider ownership, the lower the information asymmetry and need to underprice a new issue. The extent of substitutability depends on the relative marginal costs and benefits of the two IPO signals.

Country of legal origin

This study examines the relationship between the signaling variables and IPO initial returns from an international perspective, taking into consideration the legal origins of the 30 OECD countries. We highlight a few landmark papers by LLSV here by way of a brief background on the origins and practices of legal systems. They emphasized that there are two main secular legal traditions: common law and civil law. According to legal origins theory, civil law countries tend to emphasize social stability, while common law countries focus on the rights of an individual. The main point of the theory is that common law, as opposed to French civil law and to a lesser degree German and Scandinavian civil law, is associated with a greater orientation toward market institutions rather than state interventionism, such that common law countries tend to be economically more developed. Common law countries have the strongest protection for outside investors (both shareholders and creditors), whereas French civil law countries have the weakest protection. The German and Scandinavian civil law countries fall in between, although they have comparatively stronger protection for creditors, especially secured creditors.

LLSV (1997, 1998, 2000, 2007) argued that legal rules that protect investors from expropriation by insiders also shape small investors' willingness to participate in equity markets. They showed that countries with weak legal institutions have narrow capital markets and concentrated inside ownership (i.e. less float) because of low participation by outside investors. In addition, investors' participation depends not only on the laws in place but also on the confidence that these laws are enforced fairly. Banerjee *et al.* (2011) studied the impacts of country-level information asymmetry, investors' home-country bias, effectiveness of contract enforcement mechanisms, and accessibility of legal recourse on IPO underpricing in 36 countries. They documented a significantly positive relationship between country-level information asymmetry and IPO underpricing, while effective contract enforcement and accessibility of legal recourse contributed to a lower level of IPO underpricing. Similarly, Mahoney (2001) analyzed the relationship between IPO underpricing and a country's legal framework and conjectured that the quality of legal protection offered by a country affects an IPO's underpricing in two ways: a weak legal system can increase *ex ante* uncertainty about firm value over firm-level risk factors and also increase *ex ante* uncertainty of the distribution of (realized) firm value among different corporate constituents. In countries with better legal protections, managers or controlling

shareholders have fewer opportunities to transfer profits or assets out of the firm at the expense of minority shareholders. The authors contended that protection against such expropriation also reduces *ex ante* uncertainty about the returns on investment in IPOs. Engelen and Van Essen (2010) found that country-specific characteristics explain about 10 per cent of the variation in the level of underpricing and consequently face a higher cost of capital. The study examined the relationship between a country's legal framework and the level of IPO underpricing, using a large firm-level dataset of 2,920 IPOs covering a wide range of 21 countries having different institutional and legal frameworks. They inferred that the quality of a country's legal framework (as measured by its level of investor protection), the overall quality of its legal system, and its level of legal enforcement significantly reduces underpricing. As for countries with weaker legal protection, investors are more uncertain about realizing the required rate of return on their investment.

By contrast, Hopp and Dreher (2013), using panel data for 24 countries over the period 1988-2005, conjectured that underpricing is greater in countries with stronger protection for outside investors. Their justification was that current managers attempt to use underpricing as a tool to protect their private benefits of control when going public. Since underpricing predominantly attracts more investors, it will dilute both ownership and control of any possible substantial shareholders. However, similar to the studies by Banerjee *et al.* (2011), Hopp and Dreher (2013) contended that stronger law enforcement and the availability of accounting information reduces the value of private benefits of control and the eventual underpricing of IPO initial returns.

The current study addresses the impact of signaling variables (underwriters' reputation, auditors' reputation, and ownership retention) on IPO initial returns in a cross-country setting with two distinct legal origins. Thus, the above relationship is tested under both the legal origins; common law and civil law and a further test is undertaken to analyze the impact in the German, Scandinavian and French civil law countries. In the context of this study, it is conjectured that the *strength* of the relationship between the signaling variables and IPO initial returns to be stronger in the civil law countries. As stated by La Porta *et al.* (1997, 1998), common law countries exhibit a higher degree of investor protection and have more developed financial markets. This obviates managers or controlling shareholders to transfer profits or assets out of the firm at the expense of minority shareholders, consequently reducing the *ex ante* uncertainty about the return on investment in IPOs (Shleifer and Vishny, 1997). On the other hand, Civil law countries have weaker legal structures, barely protect investors from expropriation by insiders, and display increased opportunities to transfer profits or assets out of the firm at the expense of minority shareholders. The credibility of the financial disclosures by reputable auditors acts as certification, coupled with the reputation capital of reputable underwriters minimize uncertainty and information asymmetry surrounding the IPO environment. Thus, in such a legal environment, the presence of reputable underwriters/auditors and high ownership retention is expected to reduce the information asymmetry, *ex ante* uncertainty and increase investors' confidence in IPO firm quality. It is thus hypothesized that civil law countries are likely to have a stronger relationship between the signaling variables and IPO initial returns compared to common law countries. The following hypotheses are tested:

H1. The signaling relationship between underwriters' reputation and IPO initial returns is stronger in civil law countries compared to common law countries.

H2. The signaling relationship between auditors' reputation and IPO initial returns is stronger in civil law countries compared to common law countries.

H3. The signaling relationship between ownership retention and IPO initial returns is stronger in civil law countries compared to common law countries.

Corruption levels of a country

With global investors, a country's transparency *vis-à-vis* corruption has become a necessity. Governments around the world consistently invest significant money, time and effort in mitigating pressing issues of financial market stability, unemployment, and economic growth. However, corruption and greed remain a major obstacle to achieving the desired economic stability and growth. Countries with high transparency levels are associated with low corruption, and this contributes to lower information asymmetry and *ex ante* uncertainty. As suggested by Sundarasen *et al.* (2017), legal origins are relatively stable institutional aspects of a country and have some bearing on the risk perception of IPO investors. Nevertheless, the corruption level is a more nuanced view within each country's context. This study examines whether a country's corruption levels moderate or alter the relationship between the signaling variables and IPO initial returns in OECD countries.

It is proposed that the corruption level of a given country will negatively moderate the relationship between the signaling variables and IPO initial returns, primarily because low corruption levels will minimize information asymmetry, so investors will not be overly reliant on the signaling variables as a signal of firm quality. Lower corruption levels create better governance structure, advanced investors' protection mechanisms, and effective enforcement of rules and regulations, and this further mitigates the information asymmetry and uncertainty in an IPO environment. It will also increase investors' confidence about the future performance of companies. Because of the element of trust in the country's institutions from the supply side, the IPO issuer can potentially price the IPO closer to the intrinsic value of the security and so capture more of that intrinsic value, rather than underpricing it to incentivize investors (Sundarasen *et al.*, 2017).

We expect this negative moderating effect to be stronger in common law countries, where the legal environment is more predictable and less context specific than in civil law countries. Investors in common law countries may be less reliant on the signaling variables when corruption levels are low, as information asymmetry and *ex ante* uncertainty are further minimized in a low corruption environment. In the civil law countries, a highly contextualized and less predictable legal system may outweigh the influence of low corruption level. As stated by Banerjee *et al.* (2011), effective contract enforcement and accessibility of legal recourse contribute to a lower level of IPO underpricing. For the purposes of this study, the CPI obtained from Transparency International is used to gauge corruption levels. The CPI is an international aggregate indicator that ranks 183 countries in terms of the degree to which corruption is perceived to exist among public officials and politicians. The following hypotheses are tested to determine the moderating effects of corruption level on the relationship between the returns:

H4. The corruption level of a country negatively moderates the relationship between underwriters' reputation and IPO initial returns.

H5. The corruption level of a country negatively moderates the relationship between auditors' reputation and IPO initial returns.

H6. The corruption level of a country negatively moderates the relationship between ownership retention and IPO initial returns.

Data and methodology

Data

A final sample of 6,182 IPOs are obtained for 2003-2012 from the 30 selected OECD countries. Data are collected from Bloomberg, DataStream, Thomson-One.com, Thomson Reuters' Bankscope and Thomson Reuters' Worldscope. The common law sample contains 3546 IPOs, whereas the civil law sample has 2,636 IPOs.

Variables description

We adopt the initial return calculation used in Ibbotson and Jaffe (1975) and Ibbotson *et al.* (1988), which measures initial returns as:

$$IR_i = \frac{(PC_i - PO_i)}{PO_i}$$

where, IR_i is the initial return of IPO for firm i; PC_i is the first trading day closing price; and PO_i is the offer price reported in the prospectus. Most studies used the first-day trading price in computing IPO initial returns because using later trading prices (such as the end of the first week of trading) typically makes little difference (Ljungqvist, 2007). We adopted Megginson and Weiss' (1991) method of using the "relative market share of the underwriters" (in dollar terms) as a proxy for the underwriters' reputation. Underwriters' reputation (UwR) is based on the market capitalization of the companies underwritten by the investment bank for a given year. We sourced the relevant information using Megginson and Weiss' choice of underwriters by companies through the Bloomberg and Bankscope databases. Auditors' reputation is based on Titman and Trueman's (1986) and Beatty and Ritter's (1989) studies. The Bloomberg and Thomson Reuters' databases were the main sources for information on auditors' reputation. The final independent variable is ownership retention, which refers to the total number of shares retained by original owners/total number of shares issued to public. This study adopts the Downes and Heinkel (1986) measurement in determining the original owners' percentage of ownership:

$$\text{Ownership Retention} = \frac{N - N_p - N_s}{N}$$

where:

- N = total number of shares outstanding after the initial offer.
- N_p = number of primary shares in the initial offer, assumed to be entirely sold to the public by the issuer.
- N_s = number of secondary shares (previously held by the issuer) and offered by the issuer for resale to the public.

Two main legal origins are considered: common law and civil law. The civil law countries are further divided into Scandinavian, German, and French civil law. The corruption level of a country is proxied by the CPI; this information is available from the Transparency International webpage (www.transparency.org/). The CPI ranges from a score of 0 (high corruption) to 10 (low corruption). Summary of variable description and construct measurement is shown in Table II.

Variables	Operationalization
Initial Returns	Initial return : $IR_i = \frac{(PC_i - PO_i)}{PO_i}$ (Ibbotson and Jaffe, 1975; Ibbotson *et al.*, 1988)
Underwriters reputation	Underwriters' reputation (UwR) is based on the market capitalization of the companies underwritten by the investment bank for a given year. (Megginson and Weiss, 1991) Source: Bloomberg
Auditors reputation	Big 4 auditors as reputable and the others as non-reputable. If the IPO companies employed the Big 4 auditors, a value of 1 is assigned, and 0 otherwise
Ownership retention	Measures the original owners' percentage of ownership. Ownership Retention = N – Np – Ns/N (Downes and Heinkel, 1986) Where; N = total number of shares outstanding after the initial offer Np = number of primary shares in the initial offer, assumed to be entirely sold to the public by the issuer Ns = number of secondary shares (previously held by the issuer) and offered by the issuer for resale to the public
Legal origin	Two main legal origins are considered: common law and civil law. The civil law countries are further divided into Scandinavian, German, and French civil law
CPI	Corruption level of a country is proxied by the CPI. The CPI ranges from a score of 0 (high corruption) to 10 (low corruption) Source: Transparency International webpage (www.transparency.org/)
Firm size (FS)	Natural log of total assets Source: Bloomberg
Firm age (FA)	Difference between year of study and the year of incorporation Source: Bloomberg
Market condition	Weighted average of percentage change in market index for three months before the listing date of IPOs Source: Bloomberg

Table II. Variables measurement

Hypothesis testing

Correlation test is conducted to identify multicollinearity among the independent variables in the regression models. All hypotheses are corrected for heteroscedasticity; the Breusch–Pagan Godfrey is used and corrected using White's test. Subsequent to both diagnostic tests, the ordinary least squares regression method using multivariate regression is run for all the variables tested. The independent variables are centered and interacted using the Aiken *et al.*, (1991) method to determine the moderating effects of corruption level on the relationship between the signaling variables and IPO initial returns. Binary variables are not centered. The following models are tested (Table III):

Models 1-5:

$$IR_{it} = \beta_1 AudR_{it} + \beta_2 LnUwR_{it} + \beta_3 LnORetn + Control\ Variables_{it} + Year\ Dummies_{it} + Country\ Dummies_{it} + \varepsilon$$

Models 6-10:

$$IR_{it} = \beta_0 + \beta_1 AudR_{it} + \beta_2 LnUwR_{it} + \beta_3 LnORetn + \beta_4 Corr_{it} + \beta_5 AudR_{it} x\, Corr_{it} + \beta_6 LnUwR_{it} x\, Corr_{it} + \beta_{7Ln} ORetn\, x\, Corr_{it} + Control\ Variables_{it} + Year\ Dummies_{it} + Country\ Dummies_{it} + \varepsilon$$

Empirical results

Descriptive statistics

Table IV summarizes the descriptive statistics of the dependent, independent and moderating variables. It shows the results for mean, maximum, minimum, standard deviation and kurtosis for the period of 2003-2012 for all sample OECD countries. The empirical evidence suggests relatively high variability in most tested variables.

Correlation analysis

A correlations test is performed before further empirical testing. Table V presents the data correlation matrix; the correlations are generally quite low (27 out of 36 estimates

Abreviation	Description
IR	IPO Initial Return
LnFA	Natural log of Firm Age
LnFS	Natural log of Firm Size
MC	Market Condition
Ln UwR	Natural log of Underwriters' Reputation
AudR	Auditors' Reputation
LnORetn	Natural log of Ownership Retention
Corr	Corruption level
UwR × Corr	Interaction between corruption level and underwriters' reputation
AudR × Corr	Interaction between corruption level and auditors' reputation
ORetn × Corr	Interaction between corruption level and ownership retention

Table III.
Variables descriptions

	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
IR	−90.97	192.00	23.74	69.93	3.56	19.65
LnFA	4.00	101.00	23.40	141.33	13.50	188.51
LnFS	2.61	30.48	19.52	2.55	−0.28	6.68
MCon	−17.42	28.82	0.15	1.716	9.29	119.04
AudR	0.00	1.00	0.55	0.50	−0.20	1.04
LnUwR	0.01	35.00	2.97	4.93	2.25	9.21
LnORetn	0.64	97.37	13.35	17.94	1.76	5.92

Notes: IR refers to IPO Initial return, which is the difference between the first day's closing price and offer price. LnFS represents natural log of Firm Size and LnFA is the natural log of Firm Age. MCon refers to the weighted average of market returns three months prior to listing. LnUwR is the natural log of Underwriters' reputation calculated based on Megginson-Weiss underwriter market share measure; AudR represents Auditor's reputation – big-4 versus non-big-4; LnORtn measures the natural log of ownership retention

Table IV.
Descriptive statistics

	LnFA	LnFS	MCon	LnUwR	LnAudR	LnORetn	Legal
LnFA	1.000						
LnFS	−0.0017	1.000					
MCon	0.4853	−0.0645	1.000				
LnUwR	0.0537	0.0717	0.0265	1.000			
AudR	0.0317	0.1977	0.0066	0.2649	1.000		
LnORetn	−0.0275	−0.0985	−0.0371	−0.0450	−0.1776	1.000	
Legal	−0.0511	0.2846	−0.0163	−0.1064	0.0909	−0.1515	1.000

Notes: IR refers to IPO Initial return, which is the difference between the first day's closing price and offer price. LnFS represents natural log of Firm Size and LnFA is the natural log of Firm Age. MCon refers to the weighted average of market returns three months prior to listing. LnUwR is the natural log of Underwriters' reputation calculated based on Megginson-Weiss underwriter market share measure; AudR represents Auditor's reputation – big-4 versus non-big-4; LnORtn measures the natural log of ownership retention. Legal refers to the Legal Origin of a country; common law or civil law. Civil Law country includes the French, Scandinavian and German Civil Law countries

Table V.
Correlation estimates of the dataset

are less than 0.1). The correlation matrix indicates minimal levels of multicollinearity between the independent variables, control variables, and moderating variable.

Mean difference t-test between common law and civil law countries

A mean difference *t*-test is performed on the dependent and signaling variables before testing the relationship between the common law and civil law countries; the results are shown in Table VI. The sample of 6,182 IPOs is split into common law and civil law countries. The average initial return in the common law countries is 19.58 per cent, and it is 30.58 per cent for the civil law countries. The differences in the average IPO initial returns between the two groups are significant at the 1 per cent significance level. Similarly, the mean difference *t*-test results in Table VI indicate a significant difference between underwriters' reputation, auditors' reputation, and ownership retention between the common law and civil law countries. This is the basis of further testing undertaken in this study.

Signaling variables and IPO initial returns in common law and civil law OECD countries

Models 1-2 in Table VII demonstrate the difference in the strength of the relationship between underwriters' reputation, auditors' reputation, ownership retention and IPO initial returns in the civil law countries compared to common law. The empirical evidence indicates a significant relationship between all three signaling variables and IPO initial returns in both common law and civil law countries. As hypothesized, the strength of the relationship

	Common law (n = 3546)	Civil law (n = 2636)	Mean difference *t*-test	
Variable	Mean	Mean	Difference	t-statistic
Initial return	19.5993	30.586	10.9867	6.12267***
Underwriters' reputation	2.5824	3.5421	0.9597	7.43402***
Auditors' reputation	0.5690	0.5161	0.0529	−4.12311***
Ownership retention	13.7495	16.6474	2.8979	5.24004***

Note: ***Denote statistical significance at 1 per cent levels

Table VI.
Comparison of the mean values between common law and civil law countries

Table VII.
Signaling variables and IPO initial returns in the common and civil law countries

	Common law M1		Civil law M2		German civil law M3		Scandinavian civil law M4		French civil law M5	
LnUwR	−0.033**	−2.589	−0.041***	−5.274	1.739	−0.007	−0.001	−1.929	−0.129***	−3.989
AudR	−0.047***	−5.619	−1.268***	−2.775	1.308	−0.051	−0.001	−1.668	−5.415***	−3.338
LnORetn	−0.070***	−3.144	5.921***	4.118	−0.004	−0.525	−0.012	−0.723	0.174***	6.416
LnFirm age	−0.001	−0.035	−0.01100	−0.723	−0.002	−0.270	−0.160***	−14.280	−0.173***	−5.270
LnFirm size	−0.047***	−5.619	−0.000**	−2.113	−0.000	−1.853	−0.000	−1.996	−0.000***	−1.929
MCon	6.664***	10.210	3.403***	3.258	8.278***	7.433	8.735***	18.100	2.632***	2.577
Year dummies	Yes		Yes		Yes		Yes		Yes	
Country dummies	Yes		Yes		Yes		Yes		Yes	
Adjusted R^2	0.19		0.15		0.18		0.18		0.16	
Observation	3546		2636		2024		228		384	

Notes: Standard errors are adjusted for heteroskedasticity, using the White's test; **significant at the 5 per cent level; ***significant at the 1 per cent level; LnUwR is the natural log of Underwriters' reputation calculated based on Megginson-Weiss underwriter market share measure; AudR represents Auditor's reputation – big-4 versus non-big-4; LnORtn measures the natural log of ownership retention. LnFS represents natural log of Firm Size and LnFA is the natural log of Firm Age. MCon refers to the weighted average of market returns three months prior to listing

for all three signaling variables is stronger in the civil law countries as compared to the common law countries. Thus, *H1-H3* are supported.

All three signaling variables have a negative relationship, signifying that IPO initial returns are lower when IPO firms employ reputable underwriters/auditors and retain higher ownership. This is in line with the studies by Simunic and Stein (1987), Beatty (1989) and Michaely and Shaw (1995). Reputable underwriters and auditors create greater certainty among potential investors. Auditors' attestation of firms' financial information reduces asymmetric information between owners and investors, (Beatty, 1989; Datar *et al.*, 1991), thus lowering the initial returns of IPOs. Similarly, underwriters portray a strong credibility signal when the company issuing the IPOs hires a reputable underwriter (Beatty and Ritter, 1986). The stronger relationship in the civil law countries for all the three signaling variables is in line with the studies by La Porta *et al.* (1997, 1998, 2002), who documented that a country's legal framework explains the differences in the development of financial markets and the decisions of companies and investors. It indicates that the presence of reputable underwriters/auditors and high ownership retention are crucial in the civil law countries because weak legal frameworks provide managers and controlling shareholders with more opportunities to transfer profits and assets out of the firm at the expense of minority shareholders. Investors will be less uncertain about realizing returns on their investment if a country has weak legal protections and a low-quality legal framework and enforcement (Shleifer and Vishny, 1997). Reputable underwriters and auditors further increase investors' confidence in civil law countries, thus the stronger relationship. By contrast, investors in common law countries have better investor protection, more developed financial markets, and a lower degree of government intervention, as well as practice stricter regulation and enforcement, compared to French, Scandinavian, and German civil law countries. Accumulatively, these factors reduce information asymmetry and *ex ante* uncertainty in these common law countries and the presence of reputable underwriters and auditors might not be needed to attest the credibility of IPO firms.

Ownership retention, by contrast, shows a positive relationship in the civil law countries, and the strength of the relationship is greater than that in the common law countries. This indicates that high ownership retention in civil law countries increases IPO initial returns. This could be because of the aforementioned investors' protection and expropriation of profit and assets by major shareholders at the expense of the minority. Thus, high ownership retention may create more uncertainty among the potential investors, and investors expect a higher compensation for the risk taken. Issuers may also wish to underprice the IPOs to avoid any future litigation charges in an environment where the legal enforcement is less predictable (Sundarasen *et al.*, 2017). In common law countries, the negative relationship may indicate that a fundamentally strong and well-structured legal system minimizes information asymmetry and uncertainty among potential investors.

As a further test, the civil law countries are divided into three legal families (German, Scandinavian, and French civil law). The empirical results in Models 3-5 indicate that the relationship between the signaling variables and IPO initial returns are similar to Model 2, except that the strength of the relationship is strongest among the French civil law countries. No significance is documented in the Scandinavian and German civil law countries. The empirical evidence clearly signifies that the reputation of underwriters and auditors and high ownership retention play a crucial role in French civil law countries to minimize information asymmetry and *ex ante* uncertainty, as these countries have the weakest legal structure/enforcement and protection of outside investors among the three legal families. As previously stated, the civil law of German and Scandinavian countries falls between common law and French civil law and has a comparatively stronger protection

for creditors, especially secured creditors. Thus, the presence of reputable underwriters/auditors and high ownership retention are fundamental to minimizing information asymmetry and uncertainty in an environment where law enforcement and legal protection of investors/minority shareholders are relatively weaker.

Moderating effects of a country's corruption level on the relationship between the signaling variables and initial public offering initial returns

Table VIII shows the empirical results for the moderating effects of corruption level on the relationship between the signaling variables and IPO initial returns. Model 6 (M6) documents a negative moderating effect at the 1 per cent significance level for both underwriters' reputation and ownership retention. This indicates that the corruption level of a country negatively moderates the relationship between underwriters' reputation and ownership retention and IPO initial returns. Therefore, *H4* and *H6* are supported. The results for auditors' reputation is insignificant, indicating that a country's corruption level has no moderating effect on the relationship between auditors' reputation and IPO initial returns. *H5* is rejected.

The data set is sub-divided into common law and German, Scandinavian, and French civil law. Model 7 (M7) shows a negative moderation effect at the 1 per cent significance level for all the signaling variables (including auditors' reputation) in the common law countries. Similar results are documented for the Scandinavian civil law countries, except for ownership retention. However, the results differ for French and German civil law countries, as shown in Model 8 (M8) and Model 10 (M10), respectively. Corruption level does not have a moderating effect on the relationship between the signaling variables and IPO initial returns in the German civil law countries. In the French civil law countries, corruption levels moderate the relationship between underwriters' reputation and IPO initial returns, while the remaining variables are insignificant.

The negative moderation effects of corruption level on the relationship between the signaling variables and the IPO initial returns in the common law and Scandinavian civil law countries indicate that the corruption levels of a country contribute to the decrease in the relationship between the signaling variables and IPO initial returns. As hypothesized, lower corruption levels create better governance structure, advanced investors' protection mechanisms, and effective enforcement of rules and regulations, and this further mitigates the information asymmetry and uncertainty in an IPO environment. This justifies the negative moderation effect of corruption in the common law and Scandinavian civil law countries. In the German and French civil law countries, corruption level does not seem to have a moderation effect. This could be mainly because of a legal environment that is more contextualized and more risky, in which investors and issuers are more reliant on underwriters, auditors, and ownership retention as signals of firm value, regardless of the corruption level of the individual countries.

Conclusion

This study examines the difference in the signaling relationship between underwriters' reputation, auditors' reputation, and ownership retention on IPO initial returns in the common law and civil law OECD countries. The moderating role of corruption level on the abovementioned relationship is also studied. A sample of 6,182 companies from 2003 to 2012 is examined, and the results indicate that the institutional arrangements (i.e. legal origin and corruption levels) play a pivotal role in the relationship between the signaling variables and IPO initial returns. The empirical evidence from this study is in line with the signaling hypothesis and the asymmetric information model, suggesting

Table VIII.
Moderating effect of corruption on the relationship between underwriters'/ auditors' reputation and ownership retention on IPO initial returns in the common and civil law countries

	Entire dataset		Common law		German civil law		Scandinavian civil law		French civil law	
	M6		M7		M8		M9		M10	
LnUwR	−2.351***	−4.74	−0.000	−1.83	−14.260	−0.13	−0.030	−0.95	1.870	0.00
AudR	−0.346	−1.94	−0.030***	−9.96	−0.010	−0.52	−0.002	−0.04	−0.000***	−2.834
LnORetn	−0.000	−1.66	−0.14***	−4.28	−0.004	−0.50	−0.002	−0.22	−0.205***	−17.44
UWR × Corr	−0.122***	−3.83	−0.173***	−5.27	0.027	1.20	−0.028***	−9.97	−0.000***	−4.338
AuDR × Corr	0.24100	0.19	−0.036***	−2.80	0.000	−0.96	−0.000**	−2.29	−0.032	−0.970
ORetn × Corr	−0.142***	−4.28	−0.021***	−3.38	0.002	0.50	−0.578	−1.942	−0.016	−0.994
LnFirm age	0.73***	2.836	−0.13***	−3.523	−2.662***	−3.265	3.241***	13.060	1.363	−0.008
LnFirm Size	0.001***	4.695	0.006***	3.489	0.001***	4.696	1.739***	3.014	3.758***	3.180
MCon	0.086***	3.943	−0.235***	−2.836	0.070***	3.146	0.015**	2.126	0.143**	2.438
Year dummies	Yes		Yes		Yes		Yes		Yes	
Country dummies	Yes		Yes		Yes		Yes		Yes	
Adjusted R^2	0.19		0.16		0.13		0.20		0.13	
Observations	6182		3546		2024		228		384	

Notes: Standard errors are adjusted for heteroskedasticity, using the White's test; **significant at the 5 per cent level, ***significant at the 1 per cent level; UWR × Corr – interaction between underwriters' reputation and corruption level of a country; AuDR × Corr – interaction between auditors' reputation and corruption level of a country; Oretn × Corr – interaction between ownership retention and corruption level of a country

that underwriters' reputation, auditors' reputation and ownership retention represent attributes and actions that send signals to the potential investors on firm quality and reduce the information asymmetry and *ex ante* uncertainty between issuers and potential investors. The presence of a stronger relationship between the signaling variables and IPO initial returns in the civil law countries highlights the importance of reputable underwriters/auditors and ownership retention in minimizing information asymmetry and *ex ante* uncertainty in these countries. The negative moderation effects of the corruption levels in the common law and Scandinavian civil law countries also indicate that corruption levels also play a role in decreasing information asymmetry and uncertainty in these legal contexts.

There are several avenues of future research. First, expanding this study to a larger sample of jurisdictions (i.e. including the emerging markets) could provide further insights into the evolving roles of institutions on IPO initial returns. Second, a more detailed decomposition of each legal and institutional parameter could offer detailed insights into the specific aspects of the formal institutional framework and their impact on initial returns. Third, including additional institutional arrangements, such as governance, would also add value, as the specific roles of the legal and institutional framework are crucial in offering firms cheaper financing. Fourth, it would be interesting to analyze the evolution of institutional frameworks and the legal and judiciary system within a country over time and the impact on IPO initial returns. Fifth, interacting with the signaling variables and its impact on the IPO initial return could further shed light on the importance of the said variables in an IPO environment. Finally, examining the impact of the signaling variables on the long-run performance of IPO firms within the boundaries of different institutional context should be an added contribution.

Note

1. Initial returns are defined as the difference between the IPO's offer price and the closing market price on the first day of trading in the secondary market (Ibbotson *et al.*, 1988; Ritter, 1998). A positive initial return (a first day's closing price that is greater than the offer price) is also known as *IPO underpricing* and is so prevalent that the term has become synonymous with the initial returns or first-day returns (Dalton *et al.*, 2003; Ritter and Welch, 2002). The greater the IPO underpricing, the higher the initial returns, and vice versa.

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Corresponding author

Sheela Devi D. Sundarasen can be contacted at: ssundarasen@psu.edu.sa