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Societal Secrecy and IPO Underpricing

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Societal Secrecy and IPO Underpricing

ABSTRACT

We examine how societal secrecy affects the underpricing of initial public offerings (IPOs). Using a large sample of 18,304 IPOs across 38 countries, we find robust evidence that IPO underpricing is positively related to societal secrecy. Additional analyses reveal that investor protection, market openness, and third-party certification moderate the effect of societal secrecy on IPO underpricing. We find that societal secrecy influences IPO underpricing through the information asymmetry, demand for control, and information cascade channels. Collectively, we show that societal secrecy exerts a strong influence on IPO underpricing globally.

JEL Classification: G10; G15

Keywords: Initial public offerings, Cross-border investments, Societal secrecy

1. Introduction

The underpricing puzzle has attracted intense scrutiny in the last two decades, and a large body of theoretical and empirical studies has proposed several models and hypotheses to explain this anomalous phenomenon. In their seminal paper, Loughran, Ritter, and Rydqvist (1994) document substantial variation in the country-level underpricing of initial public offerings (IPOs), ranging from as low as 4.2% to as high as 80.3%. However, little, if anything, has been published on potential explanations for such large differences in international IPO underpricing. This is an important question to address, since the bulk of the IPO literature has focused on developed markets, particularly the U.S. market.

Notable studies on international IPO underpricing have mainly adopted an accounting perspective through the information asymmetry channel. For instance, Boulton, Smart, and Zutter (2010, 2011, 2017) document that variations of IPO underpricing across countries are related to cross-country differences in corporate governance, earnings quality, and accounting conservatism. We present a new perspective and posit that societal secrecy influences IPO underpricing through the information asymmetry as well as other channels.[1]

As the world's financial markets become more integrated, firms are becoming increasingly alert to the advantages of raising capital in foreign countries to fund their business operations (Stulz, 1999; Henderson, Jegadeesh, and Weisbach, 2006; Hasan, Kobeissi, and Wang, 2011). One of the important channels for obtaining foreign capital is the issuance of equity in foreign countries, that is, global IPOs (Kim and Weisbach, 2008). Doidge, Karloyi, and Stulz (2013) document that, from 1990 to 2000, capital raised by firms outside the United States increased by almost 65%, and they attribute the importance of global IPOs to the increased integration of

[1] In this study, the terms *societal secrecy* and *secrecy* are used interchangeably.

markets around the world.[2] The past decade has witnessed a trend of increasing global IPOs. A PricewaterhouseCoopers (2012) report shows that cross-border IPOs account for 9% of the volume and 13% of the value of all IPOs from 2002 to 2011. Ernst and Young (2017) reports that the global IPO market has witnessed significant fluctuations, from a low of 565 IPOs to 1,365 IPOs per year, with proceeds of US$101 billion to US$285 billion. This indicates that, not only have investors become more interested in foreign IPOs, but also firms are eager to be listed in foreign countries. This trend raises questions on what determines the variation of IPO underpricing across countries and how investors as well as firms can benefit from IPO underpricing.

Our paper is part of a growing literature on international IPO underpricing. In this paper, we introduce societal secrecy (or secrecy) as a potential explanation for such large differences in underpricing. We suggest secrecy is an important determinant of IPO underpricing across countries, since social norms are at the most basic level in the conceptual framework of Williamson (2000), who describes how formal and informal institutions affect economic transactions.[3] We hypothesize a positive relation between secrecy and IPO underpricing across countries. We provide evidence of how secrecy influences IPO underpricing through various channels. We also illustrate how investors and firms benefit from the relation between societal secrecy and IPO underpricing.

[2] Caglio, Hanley, and Marietta-Westberg (2016) document that global IPOs account for a significant fraction of the total proceeds.

[3] On April 13, 2021, *U.S. News* published the 2021 Transparency Rankings. A total of 78 nations were ranked on 76 country attributes, which were presented in a survey of over 17,000 people across the globe. The report lists the most transparent nation as Denmark (ranked first), and the least transparent as Mexico (ranked 78th). The report identifies the most transparent nations as those with open business and government practices, well-distributed political power, high levels of trustworthiness, and low levels of perceived corruption, and they tend to be among the world's strongest democracies and most affluent nations (https://www.usnews.com/news/best-countries/most-transparent-countries). Using our secrecy measure, we find that Mexico ranked the highest, while Denmark ranked the lowest in our sample.

Secrecy is defined as a preference for withholding information about a business from those who are not closely involved with its management and financing (Gray, 1988; Bos, Broekhuizen, and Faria, 2015). Secrecy is known to be an effective mechanism for protecting valuable information from outsiders (Dufresne and Offstein, 2008), and it helps firms strengthen their competitive advantages (Bos et al., 2015). While secrecy is essential in business, it is a culturally bound construct and its extent varies across countries (Gray, 1988).[4] Based on Hofstede's (1980) cultural values, Gray (1988) has developed a measure of secrecy that is widely accepted in international business research. For example, firms in high-secrecy countries are less likely to employ a Big 4 auditor (Hope, Kang, Thomas, and Yoo, 2008) and tend to have lower earnings quality (Houqe, Monem, Tareq, and Zijl, 2016).

Recent research investigates how secrecy influences investor behavior. For instance, Jank, Roling, and Smajlbegovic (2021) find that stocks with secretive short positions exhibit stronger negative returns than do stocks with non-secretive positions. Their findings are consistent with the view that secretive investors hide their short positions from competitors to protect their profitable investment strategies. Rahman, Kabir, and Oliver (2021) document that insiders of firms with a higher level of trade secrecy can gain more from trading shares of their companies. Our study adds to this strand of literature, since we document how secrecy affects IPO underpricing around the world.

Theories of underpricing can be classified under asymmetric information, institutional, control consideration, and behavioral models (Ljungqvist, 2007). Asymmetric information models assume that one of the parties to an IPO transaction knows more than the others, which gives rise to underpricing. For instance, Rock (1986) assumes that some investors are better

[4] Colella, Paetzold, Zardkoohi, and Wesson (2007) argue that pay secrecy might always be acceptable in the East, but controversial in the West.

informed about the true value of shares than other investors, and these informed investors only bid for attractively priced IPOs. Hence, underpricing is needed to encourage uninformed investors to participate in IPOs. Previous work in the institutional category shows that underpricing serves to protect against potential litigation from investors. For instance, Ibbotson (1975) argues that firms intentionally sell their shares at a discount to mitigate the possibility of lawsuits from shareholders who are disappointed with the post-IPO performance of the shares.

Prior work in the control category show that underpricing broadens the base of shareholders and investors after an IPO. Brennan and Franks (1997) propose that underpricing is a means of entrenching managerial control, while Stoughton and Zechner (1998) propose that underpricing is used to encourage monitoring. Prior research in the behavioral category typically investigates the effect of sentiment investors on stock prices. For example, Cornelli, Goldreich, and Ljungqvist (2006) state that the market for newly listed firms is a good setting for studying the effect of sentiment investors.

Examining a large sample of 18,304 IPOs across 38 countries from 1990 to 2016, we find that IPOs in countries with high societal secrecy have a greater first-day return (i.e., greater underpricing). Our results are not only statistically significant, but also economically meaningful. More specifically, we show that a one-standard-deviation increase in the secrecy score is associated with an increase of 0.0699 in the first-day return, which constitutes an 20.80% increase compared to the sample mean value.

Our findings demonstrate an implicit benefit of cross-border IPOs that has not been documented in prior research. We propose that firms located in countries with high secrecy scores could increase proceeds by having their IPOs in countries with low secrecy scores. This finding is interesting, because prior research shows that firms from developed countries exhibit a

greater cross-listing propensity toward culturally similar countries (e.g., Dodd, Frijns, and Gilbert, 2015). The findings of Dodd et al. (2015) imply that, while firms could be aware of the benefits of cross-listing in countries with a similar culture, they overlook the advantages of cross-listing in countries with a different culture, that is, societal secrecy.

To validate our main findings, we conduct a number of robustness checks. We begin by controlling for the effect of accounting conservatism on IPO underpricing and find that our main result continues to hold. We also construct alternative measures of secrecy and document that our findings are not sensitive to these alternative measures. We then perform a country-level analysis, since secrecy scores are at the country level. We also perform tests on a sample of global IPOs, where firms have IPOs in their home countries as well as in at least one foreign country on the same day, and a sample of foreign IPOs where firms have their IPOs only in foreign countries. Our findings reveal that the coefficient of secrecy remains positive and statistically significant in these tests. Additional analyses indicate that secrecy indeed affects IPO underpricing through the information asymmetry, demand for control, and the information cascade channels.

In our cross-sectional tests, we examine the effect of country institutions on the relation between secrecy and IPO underpricing. More specifically, we examine the role of investor protection, measured by the rule of law index and whether the country has a civil law system. Our findings show that the effect of secrecy on IPO first-day returns is weaker in countries with a higher rule of law index and stronger for IPOs in civil law countries. We then examine the role of market openness, measured by trade openness and foreign direct investment (FDI). Our findings suggest that the effect of secrecy on IPO first-day returns is weaker for IPOs in countries that are more open to trade and those that are more open to FDI flows. In our final test,

we find that the effect of secrecy on IPO first-day returns is stronger for IPOs in emerging markets.

We also examine the effect of IPO certification on the relation between secrecy and IPO underpricing. In particular, we employ underwriter reputation, Big 4 auditors, and the venture capital (VC) backing of IPOs as measures of IPO certification. Our results show that the effect of secrecy on IPO first-day returns is weaker for IPOs underwritten by reputable underwriters, IPOs audited by a Big 4 firm, and IPOs backed by VC.

Our study is related to that of Chourou, Saadi, and Zhu (2018), who find that national culture exerts a significant influence on IPO underpricing. However, our study is different from theirs in several aspects. First, although our measure of secrecy is constructed from Hofstede's cultural dimensions, it reflects a society's preference for secrecy versus transparency. We measure secrecy as uncertainty avoidance (*Uai*) plus power distance (*Pdi*) minus individualism (*Idv*). Chourou et al. (2018) investigate how cultural values per se affect IPO underpricing, whereas we examine how secrecy, a combination of these cultural values, influences IPO underpricing.

Second, Chourou et al. (2018) postulate that national culture influences IPO underpricing through risk tolerance, motivations, and perceived options, but they do not provide evidence on the channels through which national culture affects IPO underpricing. We hypothesize and provide evidence that secrecy affects IPO underpricing through the information asymmetry, demand for control, and informational cascade channels. Third, unlike Chourou et al. (2018), our study examines how secrecy is related to global IPOs.

These distinct differences between the study of Chourou et al. (2018) and ours lead to crucial differences in our predictions regarding secrecy and IPO underpricing. Chourou et al.

(2018) argue that there is negative relation between *Uai* and IPO underpricing. Since secrecy and *Uai* are positively related, Chourou et al. (2018) would predict a negative relation between secrecy and IPO underpricing. On the contrary, we posit a positive relation between secrecy and IPO underpricing. Consistent with our expectation, we find evidence indicating that the positive effect of secrecy on IPO underpricing goes through the channels beyond those proposed by Chourou et al. (2018).

We perform two tests to address the endogeneity problem. In our first test, we include several well-known determinants of IPO underpricing documented in the previous literature, such as anti-director rights, democracy, and media coverage. This test is performed to mitigate the omitted variable problem. In our second test, we perform an instrumental variable analysis, using the dominant genetic distance as an instrument for the secrecy score. We show that the positive relation between secrecy and IPO underpricing continues to hold. Although this evidence is supportive, we suggest that the findings be interpreted with caution. Furthermore, secrecy might be related to other unobserved social values and hence might affect IPO underpricing through its correlation with these omitted/unobserved variables. This alternative explanation, however, is not obvious, unless these omitted/unobserved variables are identified. A more balanced interpretation of our finding is that our evidence points to a significant and robust positive relation between secrecy and IPO underpricing across countries.

Our study makes at least two major contributions to the literature. First, we add to the growing literature on international IPO underpricing, as well as to the literature on secrecy and investor behavior. We extend this strand by highlighting the influence of secrecy as a fundamental factor in explaining the substantial differences in IPO underpricing across financial markets around the world. More specifically, we contribute to the emerging literature on the role

of national culture in corporate finance decisions. We are among the first to provide large-scale empirical evidence in support of Gray's (1988) secrecy hypothesis.

Our second contribution is to the international finance literature, where we are the first to examine the influence of national culture on global IPO activity. Dodd et al. (2015) examine how culture affects the cross-listing propensity of firms in developed countries. In addressing this question, we also respond to the call of Gupta, Veliyath, and George (2018), who note the importance of examining the impact of cultural dimensions on global IPO activity, since there is an interesting interplay between home and foreign country proclivities that are rooted in cultural differences. We contribute to this emerging research area by examining the impact of societal secrecy on global IPO underpricing and document a positive relation between secrecy and IPO underpricing. One implication of our findings is that firms can raise capital through IPOs by strategically choosing the culture of host countries. This study enhances our understanding of why access to pools of investors who are not available domestically is critical for financing operations globally.

2. Hypothesis development

In this section, we explain how societal secrecy influences IPO underpricing through three channels that are regarded as major explanations of IPO underpricing in prior literature (Ljungqvist, 2007): information asymmetry, the demand for control, and informational cascades. Since the secrecy measure proposed by Gray (1988) is based on Hofstede's cultural values, the current study utilizes the following values developed by Hofstede (2001): individualism, uncertainty avoidance, power distance, and masculinity.[5] These values are used to classify

[5] These cultural values were developed from a worldwide survey of IBM employees in the 1970s. In a later stage, a fifth value, long-term orientation, was added to the pool. However, fewer countries have scores for this value, and, hence, prior literature has largely concentrated on the first four cultural values.

culture across countries and have been widely used in the finance literature. For example, cultural values are found to have a profound impact on the profitability of a momentum strategy (Chui et al., 2010), risk preferences (Rieger, Wang, and Hens, 2015), cross-border mergers (Ahern et al., 2015), lottery-like stock premiums (Cheon and Lee, 2018), and firm-level corporate governance (Griffin et al., 2017).

Based on Hofstede's cultural values of individualism, uncertainty avoidance, and power distance, Gray (1988) posits that societal secrecy, the tendency to not share information with outsiders, is positively related to uncertainty avoidance and power distance and negatively related to individualism.[6] Individualism pertains to the relation between oneself and one's social network. In countries that score high in individualism, people tend to be mainly concerned with their own welfare and that of their immediate families (Hofstede, 2001). Hence, people in individualistic countries have weak social ties, compared to those in collectivistic countries. Because of the preference for strong social ties among in-group members in collectivistic countries, the opposite of individualistic countries, people tend not to trust those who are not part of their in-groups (Allik and Realo, 2004), and, hence, firms are unwilling to share information with those not closely related to them, that is, out-group members (Gray, 1988; Gudykunst, Gao, Schmidt, Nishida, Bond, Leung, Wang, and Barraclough, 1992). Huff and Kelley (2003) find that mid-level managers in collectivistic counties trust in-group members more than out-group members than managers in individualistic countries do. Stronger avoidance of ambiguity makes

[6] Gray (1988) indicates a less important link between societal secrecy and masculinity. Gray suggests that people in low-masculinity countries care more about the welfare of others than those in high-masculinity countries. Therefore, people in low-masculinity countries could be more willing to share socially related information with others than those in high-masculinity countries are. Since IPO underpricing is related to firm-specific rather than social information, masculinity is not closely related to IPO underpricing. However, as a robustness check, we compute an alternative measure of societal secrecy, defined as uncertainty avoidance plus power distance and masculinity minus individualism. We document similar findings when we use this alternative measure of secrecy in the baseline regression. Specifically, the estimated coefficient on this alternative secrecy measure is 0.1967, with a *t*-statistic of 4.51.

people have greater concerns about security. Hence, firms in countries with a high level of uncertainty avoidance prefer to withhold information from outsiders more than firms in low-uncertainty avoidance countries do, to avoid conflict and competition (Gray, 1988). Gray (1988) also argues that firms in countries that score high in power distance tend to restrict their information disclosure more than those that score low in power distance, since this practice helps sustain power inequality.

Gray's hypothesis on societal secrecy is supported by international evidence (Gray and Vint, 1995; Salter and Niswander, 1995; Hope et al., 2008). Following Hope et al. (2008), we construct our main measure of secrecy as the sum of uncertainty avoidance and power distance minus individualism. Firms in countries that score high in secrecy are less willing to share information with outsiders. We now discuss how secrecy influences IPO underpricing through the information asymmetry, demand for control, and information cascade channels. Our discussion is mainly drawn from the work of Ljungqvist (2007).

The first channel we discuss is the information asymmetry channel. While expected returns for buying IPO shares are positive for informed investors, they are negative for uninformed investors. Since informed investors will not bid for unfavorable IPOs and their demand for shares is insufficient to take up all the shares, even in attractive IPOs, IPO underwriters have to underprice IPOs to attract the participation of uninformed investors (Rock, 1986). Otherwise, most IPOs would be unsuccessful. Besides, information production is costly, and issuers need to underprice their new issues to induce investors to collect information about them (Sherman, 1992; Chemmanur, 1993).[7] Underpricing is a useful strategy for good issuers, since investors can

[7] Sherman (1992) finds that best efforts contracts enable issuers to acquire valuable information from investors' demand for new issues. Since collecting information is costly, a lower offering price is needed to attract investors to buy new shares.

distinguish them from bad issuers if they have the information (Chemmanur, 1993). Furthermore, issuers with good prospects find it optimal to signal their type by underpricing, since only they can recover the cost of this signal in the future (Allen and Faulhaber, 1989). In addition, Ritter (1984) argues that the larger the ex ante uncertainty about the value of a firm, the greater the profit of information production, which, in turn, generates more informed investors. Therefore, the greater the ex ante valuation uncertainty of an IPO firm, the greater the IPO's underpricing. Prior work supports a positive relation between valuation uncertainty and IPO underpricing (Ljungqvist, 2007).

Previous literature indicates that the more severe the information asymmetry in the IPO market, the greater the IPO underpricing (Rock, 1986; Allen and Faulhaber, 1989; Sherman, 1992; Chemmanur, 1993; Ljungqvist, 2007; Boulton et al., 2011; Chen, Goyal, Veeraraghavan, and Zolotoy, 2020). Since firms tend to restrict information disclosure in high-secrecy countries, the information asymmetry problem is expected to be greater in these countries than in low-secrecy countries. Therefore, we hypothesize a positive relation between IPO underpricing and secrecy across countries in this channel.

The second channel we discuss is the demand for control channel. If a major shareholder wants to retain control of a company after the IPO, the shareholder can do so by allocating shares to a diverse group of investors in the IPO. To do so, firms are willing to boost the demand for their IPO shares by underpricing. This strategy avoids allocating large stakes to investors and helps prevent the IPO firm's loss of control to investors. Additionally, management will prefer the same strategy, to avoid close monitoring by external investors (Brennan and Franks, 1997). The greater preference for secrecy makes firms in high-secrecy countries have a stronger desire to avoid losing control to outsiders than firms in low-secrecy countries. If a firm is closely

monitored by an outsider, the firm might have to disclose more information to outsiders. In sum, both the issuers and managers of IPO firms have a stronger desire for control in high-secrecy countries than in low-secrecy countries. This strong demand for control in high-secrecy countries give rise to a positive relation between secrecy and IPO underpricing.

The last channel is the information cascade channel. Information cascades refer to a phenomenon where latter investors rationally follow the decisions of earlier investors. Cascades arise because later investors believe that earlier investors have better information than them. For instance, Welch (1992) shows that information cascades can lead to IPO underpricing. In other words, if the information of IPO firms is distributed evenly among investors, a cascade cannot be established and IPO underpricing will be reduced. Michaely and Shaw (1994) find evidence of less IPO underpricing when information is more evenly distributed among investors. Since firms in high-secrecy countries are more reluctant to disclose information to investors than firms in low-secrecy countries are, cascades form more readily in high-secrecy countries than in low-secrecy countries.

Therefore, we expect a positive relation between secrecy and IPO underpricing in this channel. Based on the above discussion, we summarize our hypothesis about the relation between societal secrecy and IPO underpricing as follows.

H1: *There is a positive relation between societal secrecy and IPO underpricing across countries.*

3. Sample and variables

3.1. Sample selection

We obtain the data for this study from several sources. The IPO data are from the Securities Data Company (SDC) Platinum New Issue Database. Financial information and stock return data on

IPO firms are from Datastream and Worldscope. The data on the national culture dimensions of Hofstede (2001) are obtained from the author's website.[8] Data on country-level institutional, economic, financial, and regulatory factors such as disclosure requirements, the public enforcement of legal contracts, and earnings report quality are obtained from the sources listed in Appendix A.

We start by sourcing all IPOs available in the SDC Platinum New Issue Database from 1990 to 2016. Consistent with the international IPO literature (Boulton et al., 2010, 2011, 2017), we drop duplicate entries, financial firms, rights issues, warrants, closed-end funds, trusts, limited partnerships, and depository receipts. We also drop IPOs for which we fail to source all the control variables vital to this study from SDC Platinum and Worldscope. We exclude countries considered tax havens, such as Bermuda, the Cayman Islands, and a number of Caribbean Island countries, because the primary motive for incorporation in these countries is their relaxed tax consideration (Boulton et al., 2017). Further, we exclude countries for which we are unable to source the full set of national culture dimensions and countries without data for country-level institutional factors. To avoid the masking of economies with a rather small IPO market, we drop all IPOs from countries with fewer than 20 IPOs.[9] Our final sample consists of 18,304 IPOs from 38 countries.[10] To mitigate the effect of potential outliers, we winsorize all variables (except for dummy variables) at both the top and bottom one percentile.

[8] See https://geerthofstede.com/research-and-vsm/dimension-data-matrix.

[9] In line with Boulton et al. (2011), we do not impose a minimum offer price restriction. Applying a filter requiring a $1 minimum offer price (converting the local currency to U.S. dollars based on the exchange rate as of the IPO date) would greatly reduce the number of IPOs in many emerging countries. Therefore, our main analysis imposes no minimum offer price, but we do verify that our results are unaffected by the inclusion of IPOs with low offer prices.

[10] We believe that our final sample of 18,304 IPOs from 38 countries over a 27-year period is not only exhaustive, but also representative of a true global IPO data set. Our sample is in line with those of recent international studies. For example, Boulton et al. (2011) study 10,783 IPOs from 37 countries between 1998 and 2008; Lin, Pukthuanthong, and Walker (2013) study 13,759 IPOs from 40 countries between 1991 and 2011, and Boulton et al.

3.2. Variable construction

We measure IPO underpricing as the difference between the first-day secondary market closing price and the offer price, divided by the offer price (*First-day return*). In case we are unable to obtain first-day returns from the SDC Platinum New Issue Database, we use the first-day closing price from Datastream and the offer price from SDC Platinum to estimate the IPO underpricing.

Following Gray's (1988) framework, we estimate societal secrecy based on three operationalized dimensions of national culture developed by Hofstede (1980).[11] In trying to establish the connection between measures of national culture and firm-level financial and accounting parameters, Gray (1988) argues that economies with greater uncertainty avoidance and power distance and lower levels of individualism are likely to rank higher in terms of secrecy. This is because countries with strong uncertainty avoidance tend to restrict information disclosure, to avoid conflict and competition and maintain their security. Simultaneously, high–power distance societies are likely to be characterized by the restriction of information disclosure to preserve power inequalities, leading to more secrecy.

Gray (1988) also argues that secrecy is more prevalent in collectivist societies, since managers in these societies are likely to express greater concern for those closely involved with their firms than for external parties. Accordingly, we construct our main measure of secrecy (*Secrecy*) as uncertainty avoidance plus power distance minus individualism scores sourced from

(2017) study 13,285 IPOs from 36 countries between 1998 and 2014. We summarize our sample selection process in Appendix B.

[11] Kirkman, Lowe, and Gibson (2006) note that Hofstede's national culture dimensions are among the most cited cultural frameworks in international business and other several other business disciplines (Sivakumar and Nakata, 2001; Dai and Nahata, 2016).

Hofstede's (2001) cultural dimensions.[12] For ease of interpretation, we divide the secrecy measure by 100.

Our selection of IPO firm-level control variables follows prior literature (e.g., Boulton et al., 2010, 2011, 2017; Lin et al., 2013; Shi, Pukthuanthong, and Walker, 2013). Offer size (*Offer size*) is the logarithmic transformation of the Consumer Price Index–adjusted proceeds raised by the IPO in millions of U.S. dollars. The underwriter reputation dummy variable (*Underwriter*) is equal to one if the investment bank underwriting the IPO is in the top quartile in the country in terms of proceeds raised, and zero otherwise. The bookbuilding dummy variable (*Bookbuilding*) is equal to one if the IPO is conducted using a bookbuilding method, and zero otherwise. Since more than 70% of the IPOs in our study are from emerging markets and European countries, where privatization and business groups are important, we control for state ownership with a dummy variable (*SOE*) equal to one if the IPO firm is a state-owned enterprise, and zero otherwise, and we control for equity carve-out with a dummy variable (*Equity carve-out*) equal to one if the IPO firm is an equity carve-out from another firm, and zero otherwise.

Given that IPO underpricing is significantly influenced by country-level factors, such as governance (Boulton et al., 2010), disclosure requirements (Shi et al., 2013), and earnings reporting standards (Boulton et al., 2011, 2017), it is important to control for country-level institutional, economic, financial, and regulatory factors in our empirical analysis. Specifically, to account for the level of financial and economic development in the listing country, we control for IPO activity and market returns. The measure of IPO activity (*IPO activity*) is the total number of IPOs in the issue year, scaled by the number of listed firms in the year of listing. The

[12] For the sake of the robustness and validity of our secrecy variable, we also measure secrecy based on the cultural values from the 2005 release of Schwartz's dataset and the Global Leadership and Organizational Behavior Effectiveness project. The findings based on these alternative measures of secrecy are discussed later.

market return (*Market return*) is the return for the benchmark index for the country of listing over the three months preceding the offering (Demers and Joos, 2007). As for regulatory factors, we control for the public enforcement index (*Public enforce*), which proxies for the power of the individual or agency with primary oversight of a country's main stock exchange (La Porta, Lopez-de-Silanes, and Shleifer, 2006). We also control for the quality of the disclosure requirements for IPO prospectuses (*Disclosure*) in a country (Shi et al., 2013). Lastly, we follow Bhattacharya et al. (2003) and Boulton et al. (2011) and control for country-specific earnings quality, measured as earnings opacity (*Earnings opacity*).

3.3. Descriptive statistics

Table 1 presents the distribution of the IPOs in our sample across countries. The table shows that China has the largest number of IPOs (2,205 IPOs) in our sample, followed by the United States (2,204 IPOs) and Japan (1,987 IPOs). Pakistan has the highest average first-day return (1.3716), while Brazil has the lowest (0.0363). For societal secrecy, Mexico has the highest secrecy score (1.33), while Denmark has the lowest (-0.33).

[Insert Table 1 Here]

Table 2 reports the summary statistics of the variables in the baseline empirical analysis. The table shows that the mean first-day return of our sample IPOs is 0.336, with a median of 0.927. The mean value of the secrecy score is 0.5982 and the median is 0.72. In terms of control variables, the mean offer size is 3.2763. A total of 14.3% of the IPOs are underwritten by a reputable underwriter, and 54.33% of the IPOs use the bookbuilding method. Additionally, 7.74% of the IPO firms are state owned and 17.29% are equity carve-outs. Further, the mean IPO activity is 0.0913 and the mean market return is 0.0107. The mean values for the public enforcement index, quality of disclosure, and earnings opacity are 0.6245, 0.5946, and 5.6307,

respectively. Table 3 shows the correlation matrix of the variables in the baseline analysis. The table documents that first-day returns are positively correlated with the secrecy score, which is consistent with the hypothesis.

[Insert Tables 2 and 3 Here]

4. Empirical results

4.1. Baseline analysis

In this section, we examine the relation between societal secrecy and IPO underpricing. The regression specification is as follows:

$$\begin{aligned} \textit{First-day return}_{ij} = {} & \alpha + \beta_1 \textit{Secrecy}_j + \beta_2 \textit{Offer size}_{ij} + \beta_3 \textit{Underwriter}_{ij} \\ & + \beta_4 \textit{Bookbuilding}_{ij} + \beta_5 \textit{SOE}_{ij} + \beta_6 \textit{Equity carve-out}_{ij} + \beta_7 \textit{IPO activity}_j \\ & + \beta_8 \textit{Market return}_j + \beta_9 \textit{Public enforce}_j + \beta_{10} \textit{Disclosure}_j \\ & + \beta_{11} \textit{Earnings opacity}_j + \textit{Year} + \textit{Industry} + \varepsilon_i \end{aligned} \quad (1)$$

where *i* denotes the IPO firm, *j* denotes the country, *Year* and *Industry* denote year and industry fixed effects, respectively, and ε is the error term. The model is estimated with year and industry fixed effects. We use the Fama–French 12-industry classification as detailed on Kenneth French's website.[13] The model is estimated using pooled ordinary least squares (OLS), with standard errors adjusted for heteroscedasticity and clustered at the industry and year level. The reasons for adjusting standard errors at the industry and year level are twofold. First, under this method, the number of observations per cluster is large, which helps avoid bias in estimating cluster-robust standard errors (Cameron and Miller, 2015).[14] Second, prior studies indicate that

[13] See http://mba.tuck.dartmouth.edu/pages/faculty/ken.french.

[14] While the median number of observations at the country level is 125, this figure at the industry level is 1,348. To avoid bias in estimating the cluster-robust variance matrix, Cameron and Miller (2015) suggest using larger and more aggregated clusters.

IPO waves have strong industry and year elements (Pástor and Veronesi, 2005; Chemmanur and He, 2011). Following recent international literature in IPO underpricing (e.g., Liu and Ritter, 2011; Chen, Goyal, and Zolotoy, 2021), we cluster error terms at both the industry and year levels.[15]

We present the results in Table 4. In column (1), we only include the secrecy score, and, in column (2), we include IPO firm–level control variables. In column (3), we include all the control variables in the regression. All three columns include industry and year fixed effects. The results show that the coefficient of the secrecy score is positive and statistically significant, suggesting that IPOs in countries with high societal secrecy have greater first-day returns (i.e., greater underpricing). This finding is consistent with our hypothesis that there is a positive relation between societal secrecy and IPO underpricing across countries. The magnitude of the coefficient in column (3) of Table 4 shows that a one-standard-deviation increase in the secrecy score (0.4966) is associated with an increase in the first-day return of 0.4966×0.1581 = 0.0785. Given the mean first-day return is 0.336 in our sample, this constitutes an 23.37% increase compared to the mean. Therefore, the effect of societal secrecy on IPO underpricing is not only statistically significant, but also economically meaningful.

The results of the control variables in column (3) show that IPO first-day returns are positively and significantly related to underwriter reputation, whether the firm is a state-owned enterprise, whether the firm is an equity carve-out, IPO activity, market returns, and earnings opacity. These are negatively and significantly related to the offer size and the quality of disclosure.

[Insert Table 4 Here]

[15] In a robustness test discussed later, we find that our main findings hold even if the standard errors are double clustered by country and year.

4.2. Channel tests

Following Chui et al. (2016), we explore if secrecy influences IPO underpricing through the information asymmetry, demand for control, and information cascade channels. Boulton et al. (2017) suggest that accounting conservatism reduces IPO underpricing by moderating the effect of information asymmetry. We employ the estimated scores of country-level accounting conservatism (*ACons*) of Salter et al. (2013) as our measure of the degree of information asymmetry in a country. Our measure for demand for control (*DCont*) is drawn from the World Values Survey (*WVS*). We construct *DCont* as one minus the fraction of respondents who chose "seeing that people have more say about how things are done at their jobs and in their communities" as their first choice of the aim of their country in the next 10 years.[16] A higher value of *DCont* indicates that a larger fraction of the respondents have less influence over their jobs and hence corporate policies are subjected to the stricter control of senior management and/or firm owners. In other words, the higher the *DCont* score in a country, the greater a firm's demand for control in that country. Christie and Huang (1995) argue that cascades are most likely to emerge during periods of unusual market movements, and they find evidence consistent with that hypothesis. Therefore, our proxy for information cascade is the average stock market volatility (*MVol*) in a country. Our argument is that, when investor sentiment is high, there are more noise traders in the market, and noise trades generate excess volatility (De Long, Shleifer, Summers, and Waldmann, 1990). We define stock market volatility in month *t* as the standard

[16] The question in the World Values Survey we look at is the following: "People sometimes talk about what the aims of this country should be for the next ten years. On this card are listed some of the goals which different people would give top priority. Would you please say which one of these you, yourself, consider the most important? (Code one answer only under 'first choice')." If a country is covered by the World Values Survey in multiple waves, we use the mean score computed across waves as this country's score.

deviation of monthly returns on the stock market index from *t* to *t* - 35. We compute the *MVol* value of a country as its average monthly stock market volatility.[17]

We estimate our baseline model by replacing secrecy with *ACons, DCont,* or *MVol*. Consistent with Boulton et al. (2017), the estimated coefficient on accounting conservatism (*ACons*) is negative and significant. We also find that estimated coefficients on *DCont* and *MVol* are positive and significant.[18] These findings show that *ACons, DCont,* and *MVol* affect IPO underpricing in the expected direction. Hence, *ACons, DCont,* and *MVol* are appropriate measures for information asymmetry, demand for control, and information cascades, respectively. For brevity, these findings are not tabulated.

We use a two-stage procedure to investigate if secrecy affects IPO underpricing through a specific channel. In the first stage, we regress secrecy on *ACons*. The variables *S_ACons (Predicted)* and *S_ACons (Other)* of country *j* are, respectively, the predicted value and residual of country *j* from this regression.[19] By construction, *S_ACons (Predicted)* is part of the secrecy that is related to the information asymmetry channel and *S_ACons (Other)* represents part of secrecy unrelated to this channel. We repeat the first-stage procedure on *DCont* and *MVol*. The variables *S_DCont (Predicted), S_DCont (Other), S_MVol (Predicted),* and *S_MVol (Other)* are defined in the same manner. For instance, *S_DCont (Predicted)* shows the part of secrecy that is related to the demand for control channel, and *S_MVol (Predicted)* displays the part of secrecy that is related to the information cascade channel.

[17] Data on stock market indices are collected from Yahoo Finance. We use time-series means on *DCont* and *MVol,* because our cultural measures are at the country level. Besides, using the average value of *DCont* increases the coverage of countries in our test.

[18] The estimated coefficients for accounting conservatism (*ACons*), demand for control (*DCont*), and stock market volatility (*MVol*) are -0.5864 (*t*-statistic = -2.13), 0.3946 (*t*-statistic = 2.24), and 0.0100 (*t*-statistic = 1.80), respectively.

[19] We do not employ accounting conservatism, demand for control, or stock market volatility to explain societal secrecy across countries. These regressions are statistical procedures to separate the part of secrecy that is related to a given channel from the part of secrecy that is unrelated to this channel.

In the second stage, we replace secrecy with *S_ACons (Predicted)*, and *S_ACons (Other)* in the baseline regression model. Because our main independent variables in the second stage are estimated values, we use the bootstrap resampling technique (1,000 times) to estimate the standard errors.[20] If secrecy influences IPO underpricing via the information asymmetry channel, we would expect the estimated coefficients on *S_ACons (Predicted)* to be statistically significant. We also implement the procedure in the second stage for the demand for control and information cascade channels. If secrecy affects IPO underpricing through the demand for the control channel, we would expect the estimated coefficients on *S_DCont (Predicted)* to be statistically significant. Similarly, if secrecy affects IPO underpricing through the information cascade channel, we would expect the estimated coefficients on *S_MVol (Predicted)* to be statistically significant. The results reported in Table 5 confirm our expectations. The estimated coefficients on *S_ACons (Predicted)*, *S_DCont (Predicted)*, and *S_MVol (Predicted)* are significantly positive. These findings are consistent with the notion that secrecy affects IPO underpricing through the suggested channels.

[Insert Table 5 Here]

5. Cross-sectional analysis

5.1. Effect of country institutions

In this section, we examine the effect of a number of country institutions on the relation between societal secrecy and IPO underpricing. First, we examine the role of investor protection, measured by the rule of law and civil law countries. The rule of law (*Rule of law*) is a country-specific index for the extent to which agents have confidence in and abide by the rules of society. We obtain the index values from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).

[20] We thank an anonymous referee for this excellent suggestion.

Higher values of the rule of law indicate better investor protection. The indicator for civil law countries (*Civil law*)[21] is a dummy variable equal to one if the IPO firm is listed in a civil law country, and zero otherwise. In civil law countries, the interests of minority shareholders are not well protected, exposing them to greater risk of managerial expropriation (La Porta et al., 1998).

We interact the two variables with the secrecy score and include the interaction terms in the regression specification in Equation (1), respectively. The results are presented in columns (1) and (2) of Table 6. Column (1) shows that the coefficient of *Secrecy×Rule of law* is negative and statistically significant, suggesting that the effect of societal secrecy on IPO first-day returns is weaker for IPOs in countries with a higher rule of law index. Column (2) shows that the coefficient of *Secrecy×Civil law* is positive and statistically significant, suggesting that the effect of societal secrecy on IPO first-day returns is stronger for IPOs in civil law countries. Since a higher rule of law index indicates better investor protection and civil law countries have weaker investor protection, the findings suggest that societal secrecy has a greater effect on IPO underpricing in countries with weaker investor protection. These results are likely, as information asymmetry and informational cascades are greater in countries with weak investor protection.

Next, we examine the role of market openness, measured by trade openness and FDI openness. Trade openness (*Trade openness*) is measured by an index published by the International Chamber of Commerce that measures a country's openness to trade. The index ranges from one to six, with higher values indicating greater openness to trade. FDI openness (*FDI openness*) is measured by an index published by the International Chamber of Commerce

[21] Argentina, Austria, Belgium, Brazil, Chile China, Denmark, Finland, France, Germany, Greece, Indonesia, Italy, Japan, South Korea, Mexico, the Netherlands, Norway, the Philippines, Spain, Sweden, Switzerland, Taiwan, and Turkey.

regarding the ease with which FDI can flow into a country. The index ranges from one to six, with higher values indicating the easier flow of FDI into the country.

We interact the two variables with the secrecy score and include the interaction terms in the regression specification in Equation (1), respectively. We present the results in columns (3) and (4) of Table 6. Column (3) shows that the coefficient of *Secrecy×Trade openness* is negative and statistically significant, suggesting that the effect of societal secrecy on IPO first-day returns is weaker for IPOs in countries that are more open to trade. Column (4) shows that the coefficient of *Secrecy×FDI openness* is negative and statistically significant as well, suggesting that the effect of societal secrecy on IPO first-day returns is weaker for IPOs in countries that are more open to FDI flows. Overall, the findings suggest that societal secrecy has a weaker effect on IPO underpricing in countries that are open to trade and FDI flows. Because countries that are more open tend to be more affected by foreign cultures, the effect of local secrecy culture on the stock market and hence IPO pricing should be weaker.

Last, we examine the role of emerging market status, measured by a dummy variable (*Emerging*) equal to one if the IPO firm is listed in an emerging market, and zero otherwise.[22] We interact the variable with the secrecy score and include the interaction terms in the regression specification in Equation (1). The results presented in column (5) of Table 6 show that the coefficient of *Secrecy×Emerging* is positive and statistically significant, suggesting that the effect of societal secrecy on IPO first-day returns is stronger for IPOs in emerging markets. This result is consistent with emerging markets typically having lower-quality institutions and weaker investor protection than developed markets (Chen et al., 2011), which strengthens asymmetric information and informational cascades, which, in turn, magnify the effect of cultural factors.

[22] The emerging markets in our sample include Argentina, Brazil, Chile, China, India, Indonesia, Malaysia, Mexico, Pakistan, the Philippines, South Africa, Thailand, and Turkey.

[Insert Table 6 Here]

5.2. Effect of IPO certification

In this section, we examine the effect of IPO certification on the relation between societal secrecy and IPO underpricing. Since IPO firms are young, they are subject to severe information asymmetry problems. To infer the quality of an IPO firm, investors usually rely on certification by other parties in the IPO process, including whether the IPO is underwritten by a high-quality underwriter (Carter and Manaster, 1990), whether the firm is audited by a high-quality auditor prior to the IPO (Menon and Williams, 1991), or whether the IPO firm is backed by a VC firm (Megginson and Weiss, 1991; Loughran and Ritter, 2004). Following these studies, we employ three variables in this test. Our variable for underwriter reputation (*Underwriter*) is denoted by a dummy variable equal to one if the investment bank underwriting the IPO is in the top quartile in the country in terms of proceeds raised, and zero otherwise; our variable for Big 4 auditors (*Big 4 auditor*), is denoted by a dummy variable equal to one if the IPO firm is audited by a Big 4 auditing firm, and zero otherwise; and our variable for VC backing of the IPO (*VC back*) is denoted by a dummy variable equal to one if the IPO firm is backed by VC, and zero otherwise.

We interact the three variables with the secrecy score and include the interaction terms in the regression specification in Equation (1), respectively. The results presented in Table 7 show that the coefficients of *Secrecy×Underwriter, Secrecy×Big 4 auditor,* and *Secrecy×VC back* are negative and statistically significant. Our findings suggest that the effect of societal secrecy on IPO first-day returns is weaker for IPOs underwritten by reputable underwriters, IPOs audited by

a Big 4 auditing firm, and IPOs backed by VC. Our findings are in line with the notion that IPOs certified by other parties have less asymmetric information, reducing the effect of secrecy.[23]

[Insert Table 7 Here]

6. Additional tests

6.1. Robustness checks

In this section, we perform a number of tests to examine the robustness of our main finding. First, we examine whether the findings hold when we employ alternative secrecy measures. In the baseline analysis, we construct the secrecy score using the uncertainty avoidance, power distance, and individualism scores sourced from Hofstede's (2001) cultural dimensions. Salter and Niswander (1995) argue that only uncertainty avoidance and individualism correctly predict country-level secrecy in terms of accounting reporting practices in 80% of cases internationally. Accordingly, we construct an alternative measure of secrecy, defined as uncertainty avoidance minus individualism.

Another set of frequently used cultural values is constructed by Schwartz (1994), whose survey is regarded as the "most extensive research project on values so far" (Hofstede, 2001, p. 8). Schwartz classifies cultures into three condensed dimensions: embeddedness versus autonomy, egalitarianism versus hierarchy, and harmony versus mastery. Schwartz (2004) suggests that Hofstede's individualism and power distance conceptually overlap with embeddedness (reversed) and egalitarianism (reversed). Yet, Hofstede's uncertainty avoidance

[23] The empirical relation between IPO underpricing and underwriter reputation/VC backing is unclear. Consistent with prior studies using international IPO data (Boulton et al., 2010; Boulton et al., 2017; Duong, et al., 2022), we find that IPO underpricing is positively related to underwriter reputation. We document a positive and significant relation between VC backing and IPO underpricing, and this finding is consistent with studies in IPO underpricing (Lee and Wahal, 2004; Bajo, Chemmanur, Simonyan, and Tehranian, 2016; Chemmanur, Krishnan, and Yu, 2018).

does not have a good corresponding Schwartz (2004) cultural measure.[24] We collect data from the 2005 release of Schwartz's dataset and construct an alternative measure of secrecy as embeddedness minus egalitarianism. We perform the same regression as in Equation (1) using the two alternative secrecy measures and report the results in Panel A of Table 8. We show that the coefficient of secrecy remains positive and statistically significant, demonstrating that our findings are robust to alternative secrecy measures.

Second, we adopt an alternative IPO underpricing measure. In the baseline analysis, we measure IPO underpricing using the IPO first-day return, calculated as the difference between the first-day secondary market closing price and the offer price, divided by the offer price. To mitigate the concern that our findings are driven by general stock market conditions on the listing day, we adjust the IPO first-day return by the listing-day market return. We perform the same regression as in Equation (1), using an alternative IPO underpricing measure. The results reported in Panel B of Table 8 show that the coefficient of secrecy continues to be positive and statistically significant, implying that our findings hold when we use an alternative measure of IPO underpricing.[25]

Third, we examine whether our core results hold in alternative model estimations. In the baseline analysis, we clustered standard errors at the industry–year level. As an alternative method, we cluster standard errors at the country–year level. Column (1) in Panel C of Table 8 shows that the relation between secrecy and IPO underpricing remains positive and significant.

[24] Schwartz (2004) argues that harmony is a measure close to Hofstede's uncertainty avoidance. However, Hofstede's uncertainty avoidance emphasizes controlling ambiguity, and this assertion of control is not the underlying value of harmony (Schwartz, 2004). Since our hypothesis implies that people actively protect their secrecy, it is not suitable to replace uncertainty avoidance with harmony in this study. Nonetheless, if we measure secrecy as harmony plus embeddedness minus egalitarianism and re-estimate the baseline regression, the estimated coefficient on secrecy is 0.0661, with a *t*-statistic of 2.28. In sum, we find that secrecy continues to exert a significant positive impact on underpricing.

[25] We thank an anonymous referee for suggesting this measure to us.

Prior research suggests that IPO underpricing is also related to IPO methods (Benveniste and Spindt, 1989; Welch, 1992; Benveniste and Busaba, 1997; Jenkinson and Ljungqvist, 2001; Derrien and Womack, 2003). In line with the work of Duong et al. (2022), most firms in our sample employ either firm commitment or bookbuilding. To explore how different IPO methods could affect our results, we include two dummy variables, firm commitment and bookbuilding, and their interaction with secrecy in our baseline model. We estimate the revised model and present the results in column (2) in Panel C of Table 8. The findings suggest that both the pricing techniques when interacted with secrecy fail to exert a significant effect on IPO listing-day returns, whereas secrecy by itself continues to amplify IPO underpricing. Consistent with Boulton et al. (2017), we find that firm commitment has a significant negative effect on underpricing.

Fourth, we conduct analysis using alternative samples. In the first test, we perform a country-level analysis, given the secrecy score is at the country level. We calculate the average first-day returns across all IPOs for each country in each year. All the IPO-level control variables, including offer size, underwriter reputation, bookbuilding, whether the firm is a state-owned enterprise, and business group affiliation, are converted to country-level variables in the same way. Then, we perform the same regression as in Equation (1), except that we are unable to control for industry fixed effects.

In the second test, we analyze global IPOs, referring to cases in which firms have IPOs in their home countries as well as in at least one foreign country on the same day. We regress differences in the underpricing of the same IPO between the home and foreign countries against differences in societal secrecy, other country-level determinants, and offer size. We include the difference of the offer size in the regression since it could differ between countries for the same

IPO. Since the general stock market conditions in different countries on the listing day could be different, we subtract the stock market return from the first-day return on the listing day before computing the difference in the underpricing of the same IPO.[26] The advantage of this test is that the firm characteristics other than offer size are constant, and thus the differences in IPO underpricing should only be related to country characteristics, such as secrecy and offer size. We perform the same regression as in Equation (1) on global IPOs.

In the third test, we examine a sample of foreign IPOs, where IPO firms have their IPOs only in foreign countries. We conduct the same regression as in Equation (1) on foreign IPOs, with societal secrecy and other country-level characteristics measured based on the foreign country in which the IPO is carried out. The results of the three tests reported in Panel D of Table 8 show that the coefficient of secrecy or difference in secrecy is positive and statistically significant, suggesting that the relation between societal secrecy and IPO underpricing holds in alternative samples.

Fifth, we include other cultural values as additional control variables in the regression. Chourou et al. (2018) state that individualism and uncertainty avoidance are negatively related to IPO underpricing, since individualism emphasizes individual interests and uncertainty avoidance focuses on rule following and risk aversion. The authors also posit that power distance and masculinity are positively related to IPO underpricing, since power distance accentuates the acceptance of inequalities and masculinity stresses achievement and ambition. We measure societal secrecy as uncertainty avoidance plus power distance minus individualism. Therefore, the positive relation between societal secrecy and IPO underpricing could be driven by the positive effect of power distance on IPO underpricing and the negative effect of individualism on

[26] We thank an anonymous referee for this insightful suggestion.

IPO underpricing through the channels outlined by Chourou et al. (2018).[27] In other words, secrecy might not influence IPO underpricing through the secrecy channel argued in this study.

To explore this possibility, we include adjusted individualism (*Adj. Idv*), adjusted power distance (*Adj. Pdi*), adjusted uncertainty avoidance (*Adj. Uai*), and masculinity (*Mas*) in our baseline model. To mitigate the strong correlation between secrecy and each cultural value, we use the adjusted cultural value in this test. The adjusted individualism of country *j* is calculated as the sum of the intercept (α) and the residual (ε_j) from the following regression:

$$Individualism_j = \alpha + \beta Secrecy_j + \varepsilon_j \quad (2)$$

where *j* denotes the country and ε is the error term. The model is estimated using OLS. We use the same method to estimate adjusted uncertainty avoidance and the adjusted power distance. We present the results in Panel E of Table 8. To avoid perfect multicollinearity, we do not include all the cultural values in the same regression. Instead, we include adjusted uncertainty avoidance, the adjusted power distance, and masculinity in column (1); adjusted individualism, the adjusted power distance, and masculinity in column (2); and adjusted individualism, adjusted uncertainty avoidance, and masculinity in column (3). Consistent with Chourou et al. (2018), we document that, while adjusted individualism is negatively related to IPO underpricing, masculinity is positively related to IPO underpricing. After controlling for societal secrecy, we find that the adjusted power distance is negatively related to IPO underpricing, and the sign of the estimated coefficient on adjusted uncertainty avoidance depends on the model specification. These findings are inconsistent with the results of Chourou et al. (2018). More importantly, we find that the

[27] By construction of our secrecy measure, the positive relation between societal secrecy and IPO underpricing cannot be explained by the negative relation between uncertainty avoidance and IPO underpricing posited in Chourou et al. (2018).

coefficient of secrecy is positive and significant in all three columns, suggesting that the effect of secrecy on IPO underpricing goes beyond the channels proposed by Chourou et al. (2018).

Last, to further mitigate the concern that our findings are driven by the omitted variable problem, we include a number of country-level institutional variables and other variables documented by prior studies as affecting IPO outcomes (e.g., Boulton et al., 2017; Chen et al., 2021; Duong et al., 2022). Specifically, we include anti-director rights (*Anti-director rights*), creditor rights (*Creditor rights*), democracy (*Democracy*), property rights (*Property rights*), accounting conservatism (*ACons*), media coverage (*Media coverage*), market integration (*Market integration*), the rule of law (*Rule of law*), and corruption perception (*Corruption perception*). To avoid potential multicollinearity and a reduction in sample size, we do not include all these variables in the same regression, but, rather, include them one by one. The results reported in Panel F of Table 8 show that the coefficient of secrecy is positive and statistically significant, implying that the relation between societal secrecy and IPO underpricing across countries is robust after we control for additional control variables. Consistent with the literature, we find that *Democracy*, *Media coverage*, and *Market integration* have a negative and significant effect on IPO underpricing (Marcato et al., 2018; Chen et al., 2020; Duong et al., 2021).

[Insert Table 8 Here]

6.2. Instrumental variable analysis

There are two potential endogeneity problems in our analysis, namely, the problems of omitted variables and reverse causality. In the baseline analysis, we include a set of control variables and industry and year fixed effects. In the robustness tests, we further include other cultural values, country institutions, and other determinants of IPO underpricing as additional control variables.

Our results continue to hold in all these tests. Although this evidence is promising, our findings must be interpreted with caution. While the omitted variable problem is largely remedied, it may still exist. A fair interpretation of our findings is that the effect of secrecy on IPO underpricing is unlikely to be driven by the correlation between secrecy and the country-level variables considered in this study.[28]

Further, our findings seem unlikely to be driven by reverse causality, since secrecy is at the country level and exogenous to the outcomes of individual IPOs. Nevertheless, we perform an instrumental variable analysis to further mitigate endogeneity concerns. Following prior studies (e.g., Ahern et al., 2015; Eun, Wang, and Xiao, 2015), we use the dominant genetic distance of a country from the country with the highest secrecy score and from that with the lowest as instruments for the secrecy score. The dominant genetic distance values measure the difference in genetic distributions between the populations of the two countries and are thus related to the differences in their secrecy culture. In our sample, the country with the lowest secrecy score is Denmark and the country with the highest is Mexico. Accordingly, we construct the genetic distance from Denmark (*FST Denmark*) as the logarithmic transformation of the genetic distance between Denmark and the country of the IPO firm listing, and the genetic distance from Mexico (*FST Mexico*) as the logarithmic transformation of the genetic distance between Mexico and the country of the IPO firm listing.

Suppose the genetic distance is related to secrecy. In this case, a country having a greater genetic distance from Denmark (Mexico) would have a higher (lower) secrecy score than Denmark (Mexico), because of the construction of the instrumental variables. In other words, *FST Denmark* is expected to be positively related to secrecy and *FST Mexico* negatively related

[28] We thank an anonymous referee for pointing out the limitation of our tests on endogeneity.

to secrecy. Since there is no direct relation between the dominant genetic distance and the outcomes of individual IPOs, the two instrumental variables meet the relevance and exclusion conditions (Larcker and Rusticus, 2010).

We perform a two-stage least squares regression using the two instruments and report the results in Table 9. Column (1) presents the results of the first-stage regression. Consistent with our prediction, we find that the coefficient of the genetic distance from Denmark is positive and significant and the coefficient of the genetic distance from Mexico is negative and significant. Since we have more instruments than endogenous regressors, we perform the Hansen–Sargan test of overidentifying restrictions. The test statistic and the corresponding *p*-value indicate that the test for overidentifying restrictions is satisfactory and that the instruments are uncorrelated with the error term of the second-stage model, providing support for the instruments' validity. Furthermore, the *F*-statistic for the excluded instruments suggests that the two instrumental variables have a strong influence on the likelihood of secrecy for countries with respect to Denmark and Mexico, and the issue of weak instruments is not a concern in our setting (Stock et al., 2002). In the second-stage regression reported in column (2), the coefficient of the instrumented secrecy score is positive and significant, suggesting that our results hold in the instrumental variable analysis.

This evidence suggests that our findings are unlikely to be driven by reverse causality. Nevertheless, this evidence should not be construed as indicating that secrecy is a cause of IPO underpricing. We do not rule out the possibility of secrecy being related to an unobserved social value that potentially drives our findings. The above alternative explanation, however, cannot be established unless these omitted/unobserved variables are identified.

[Insert Table 9 Here]

7. Conclusions

In this paper, we study how societal secrecy affects the underpricing of IPOs. Prior literature suggests that cultural values such as societal secrecy have a significant effect on human decisions under uncertainty and ambiguity (Leung, Bhagat, Buchan, Erez, and Gibson, 2005). Given that IPO firms have no prior price history and are young, and informationally opaque, societal secrecy should have a strong impact on IPO underpricing. We propose societal secrecy as a potential factor for the differences in IPO underpricing in markets around the world. We hypothesize a positive relationship between societal secrecy and IPO underpricing.

We document several interesting results. First, we show that the coefficient of the secrecy score is positive and statistically significant, suggesting that IPOs in countries with high societal secrecy have greater first-day returns (i.e., greater underpricing). We construct alternative measures of secrecy and document that our main findings continue to hold. We also perform country-level analysis, since societal secrecy is at the country level. In addition, we perform tests on a sample of global IPOs, where firms have IPOs in their home countries as well as in at least one foreign country on the same day, and on a sample of foreign IPOs, where firms have their IPOs only in foreign countries. Our core evidence continues to hold. Further, we perform a number of cross-sectional tests and find that the effect of secrecy on IPO underpricing is weaker for IPOs in countries with stronger investor protection or greater market openness. The effect is also weaker for IPOs underwritten by reputable underwriters, IPOs audited by a Big 4 auditor, and IPOs backed by VC. We provide evidence that secrecy influences IPO underpricing through the information asymmetry, demand for control, and information cascade channels.

Our main contribution is to show that societal secrecy exerts a strong influence on IPO underpricing internationally. Our findings point to an important implicit benefit of cross-border

IPOs that has been overlooked by prior literature. Our point is that having an IPO in a distinct culture entails higher transaction costs. However, firms in high-secrecy countries can raise more capital by having their IPOs in low-secrecy countries. Given that cross-border IPO activities will continue to evolve, our results have implications for investors who would like to participate in foreign IPOs and to firms interested in cross-border IPOs.

Our findings also point toward new directions for further research. For instance, Santacreu-Vasut, Shenkar, and Shoham (2014) and Cuypers, Ertug, and Hennart (2015) examine the impact of linguistic distance on board structures and cross-border acquisitions, respectively. Cuypers et al. (2015) document that acquirers take lower equity stakes in foreign targets when the linguistic distance between them is large, and higher stakes when the combined lingua franca proficiency is high. Although our focus is on the effect of societal secrecy on IPO underpricing, a fruitful area of future research could be to study the interplay of linguistic distance and IPO underpricing.

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Appendix A. Variable definitions

Variable	Definition
ACons	Estimated scores of country-level accounting conservatism. Data source: Salter et al. (2013).
Adj. IDV	Sum of the intercept and the residual from the regression that regresses the individualism score (divided by 100) on secrecy. Data source: Hofstede (1980).
Adj. PDI	Sum of the intercept and the residual from the regression that regresses the power distance (divided by 100) score on secrecy. Data source: Hofstede (1980).
Adj. UAI	Sum of the intercept and the residual from the regression that regresses the uncertainty avoidance score (divided by 100) on secrecy. Data source: Hofstede (1980).
Anti-director rights	Country-specific anti-director shareholder rights index. Data source: Djankov et al. (2008) and Spamann (2010).
Big 4 auditor	Dummy variable equal to one if the IPO firm is audited by a Big 4 auditing firm, and zero otherwise. Data source: SDC Platinum.
Bookbuilding	Dummy variable equal to one if the IPO uses the bookbuilding method, and zero otherwise. Data source: SDC Platinum.
Civil law	Dummy variable equal to one if the IPO firm is listed in a civil law country, and zero otherwise. Data source: La Porta et al. (1998).
Corruption perception	Country-specific corruption perception index. Data source: Transparency International.
Creditor rights	Country-specific creditor rights index. Data source: Djankov et al. (2007).
DCont	One minus the fraction of respondents who chose "seeing that people have more say about how things are done at their jobs and in their jobs and in their communities" as their first choice of the aim of their country in the next 10 years. Data source: World Values Survey.
Democracy	An index that measures a country's institutional democracy. The index ranges from zero to 10, with higher values indicating greater institutional democracy. Data source: Polity V Project (2018).
Disclosure	Country-specific stringency of the disclosure requirements for IPO prospectuses. Data source: Shi et al. (2013).
Earnings opacity	Country-specific earnings opacity measure, constructed based on earnings aggressiveness, loss avoidance, and earnings smoothing. Data source: Boulton et al. (2011).

Emerging	Dummy variable equal to one if the IPO firm is listed in an emerging market, and zero otherwise. Data source: International Monetary Fund World Economic Outlook Database.
Equity carve-out	Dummy variable equal to one if the IPO is an equity carve-out from another firm, and zero otherwise. Data source: SDC Platinum.
FDI openness	An index that measures the ease with which FDI can flow into a country. The index ranges from one to six, with higher values indicating greater openness to FDI flow. Data source: International Chamber of Commerce.
Firm commitment	Dummy variable equal to one if the underwriter guarantees it will purchase all the securities offered for sale by the issuer, regardless of whether they can be sold to investors, and zero otherwise. Data source: SDC Platinum.
First-day return	IPO first-day secondary market closing price minus the offer price, divided by the offer price. Data source: SDC Platinum and Datastream.
FST Denmark	Logarithmic transformation of the genetic distance between Denmark and the country of the IPO firm listing. Data source: Spolaore and Wacziarg (2009).
FST Mexico	Logarithmic transformation of the genetic distance between Mexico and the country of the IPO firm listing. Data source: Spolaore and Wacziarg (2009).
IPO activity	Total number of IPOs in the issue year divided by the number of listed firms in the country in the issue year of the IPO. Data source: SDC Platinum and World Federation of Exchanges.
Market integration	Measure of the actual market integration of one country with the global markets by identifying the explanatory power of a multifactor model on global factors. Data source: Marcato et al. (2018).
Market return	Return for the benchmark index for the country of listing over the three months preceding the offering. Data source: Datastream.
MAS	Masculinity score divided by 100. Data source: Hofstede (1980).
Media coverage	Logarithmic transformation of the number of times the IPO firm is cited in the media up to 30 days prior to listing. Data source: RavenPack.
MVol	Average monthly stock market volatility of a country during the country's sample period. The monthly stock market volatility is calculated as the standard deviation of monthly returns on the stock market index from month t to t - 35. Data source: Datastream.
Offer size	Logarithmic transformation of the Consumer Price Index–adjusted proceeds raised by the IPO in millions of U.S. dollars. Data source: SDC Platinum.
Property rights	Country-specific legal structure and the security of property rights index. Data source: Fraser Institute.
Public enforce	Public enforcement index that measures the powers of the individual or agency with primary oversight of a country's main stock exchange. Data source: La Porta et al. (2006).
Rule of law	Country-specific index for the extent to which agents have confidence in and abide by the rules of society. Data source: La Porta et al. (1998).
Secrecy	Uncertainty avoidance score plus the power distance score minus the individualism score, divided by 100. Data source: Hofstede (1980).
SOE	Dummy variable equal to one if the IPO firm is a state-owned enterprise, and zero otherwise. Data source: SDC Platinum.

Trade openness	An index that measures a country's openness to trade. The index ranges from one to six, with higher values indicating greater openness to trade. Data source: International Chamber of Commerce.
Underwriter	Dummy variable equal to one if the investment bank underwriting the IPO is in the top quartile in the country in terms of proceeds raised, and zero otherwise. Data source: SDC Platinum.
VC back	Dummy variable equal to one if the IPO firm is backed by VC, and zero otherwise. Data source: SDC Platinum.

Appendix B: Sample selection criteria

Criteria		No. of IPOs
SDC Platinum Sample for all IPOs from 1990 to 2016		70,111
Less: IPOs with non-matching CUSIP/ticker/firm names from Worldscope	16,707	
Less: IPOs missing data from SDC Platinum and Worldscope	20,953	
Less: Foreign listings, closed-end funds, cross listings, and rights offerings	4,470	
Less: Duplicate CUSIP entries/firm names	2,530	
Less: Countries for which national culture data are unavailable	5,327	
Less: Countries considered tax havens	1,033	
Less: Countries whose public enforcement, disclosure, and earnings opacity data are unavailable	787	
Final sample		18,304

Table 1
Sample distribution

Country	Obs.	Average first-Day return	Average total proceeds (US$ millions)	Secrecy
Argentina	31	0.2143	203.7151	0.89
Australia	1,124	0.2069	70.1836	-0.03
Austria	37	0.1605	199.9454	0.26
Belgium	62	0.0790	172.7965	0.84
Brazil	123	0.0363	412.9022	1.07
Canada	974	0.4802	51.3291	0.07
Chile	36	0.4330	385.0161	1.26
China	2,205	0.4312	107.5898	0.90
Denmark	50	0.3139	184.6035	-0.33
Finland	45	0.1361	250.6806	0.29
France	502	0.1080	261.9847	0.83
Germany	320	0.1622	589.2467	0.33
Greece	132	0.1619	85.8169	1.25
Hong Kong	775	0.6686	114.8444	0.72
India	1,262	0.3119	127.1841	0.69
Indonesia	322	0.5158	57.1045	1.12
Ireland	33	0.0592	191.3635	-0.07
Israel	95	0.8339	71.2324	0.40
Italy	178	0.0594	36.7642	0.49
Japan	1,987	0.3820	171.6630	1.00
Malaysia	672	0.1764	80.4056	1.10
Mexico	69	0.1001	346.0173	1.33
Netherlands	65	0.0385	86.1328	0.11
New Zealand	82	0.0459	64.8635	-0.08
Norway	106	0.3074	273.4058	0.12
Pakistan	102	1.3716	53.4734	1.11
Philippines	96	0.1731	474.9041	1.06
Singapore	431	0.2548	134.3385	0.62
South Africa	59	0.2311	103.1008	0.33
South Korea	867	0.3448	14.1917	1.27
Spain	70	0.4309	91.4847	0.92
Sweden	141	0.1616	92.5657	-0.11
Switzerland	72	0.2108	117.9537	0.24
Taiwan	1,147	0.1777	62.9797	1.10
Thailand	470	0.4029	130.7288	1.08
Turkey	126	0.2827	29.1776	1.14
United Kingdom	1,232	0.1536	218.4810	-0.19
United States	2,204	0.3233	115.7374	-0.05
Total	18,304	0.3360	123.7971	0.60

This table presents the country-wide distribution of IPOs, average first-day returns, average total proceeds, and societal secrecy scores. Variable definitions are presented in Appendix A.

Table 2
Summary statistics

Variables	Unit	Mean	Std. dev.	5%	Median	95%
First-day return	Ratio	0.3360	1.4426	-0.9998	0.0927	1.7273
Secrecy	Ratio	0.5982	0.4966	-0.1900	0.7200	1.2700
Offer size	Natural log (US$ millions)	3.2763	1.6767	0.6027	3.2029	6.0875
Underwriter	Ratio	0.1430	0.3501	0.0000	0.0000	1.0000
Bookbuilding	Ratio	0.5433	0.4981	0.0000	1.0000	1.0000
SOE	Ratio	0.0774	0.2673	0.0000	0.0000	1.0000
Equity carve-out	Ratio	0.1734	0.3786	0.0000	0.0000	1.0000
IPO activity	Ratio	0.0913	0.0753	0.0203	0.0772	0.2298
Market return	Ratio	0.0107	0.0409	-0.0500	0.0105	0.0714
Public enforce	Ratio	0.6245	0.2858	0.0000	0.7180	0.9000
Disclosure	Ratio	0.5946	0.2852	0.1000	0.6600	1.0000
Earnings opacity	Scale (0 to 10)	5.6307	1.4402	3.6300	5.7000	8.0300
Obs.				18,304		

This table presents the summary statistics for the variables used in the baseline model. Variable definitions are presented in Appendix A.

Table 3
Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	*First-day return*	1.000											
(2)	*Secrecy*	0.172	1.000										
(3)	*Offer size*	-0.339	-0.158	1.000									
(4)	*Underwriter*	0.046	-0.178	0.159	1.000								
(5)	*Bookbuilding*	-0.244	-0.069	0.710	0.425	1.000							
(6)	*SOE*	-0.019	-0.067	0.411	0.022	0.399	1.000						
(7)	*Equity carve-out*	-0.101	0.097	0.669	-0.090	0.381	0.366	1.000					
(8)	*IPO activity*	-0.240	-0.093	0.078	0.097	0.119	0.123	-0.076	1.000				
(9)	*Market return*	0.277	0.144	0.166	-0.103	0.081	0.438	0.199	0.204	1.000			
(10)	*Public enforce*	0.137	-0.023	-0.152	-0.008	-0.290	-0.161	-0.032	0.159	0.049	1.000		
(11)	*Disclosure*	-0.053	-0.193	-0.255	0.222	-0.213	-0.267	-0.200	-0.411	-0.309	0.249	1.000	
(12)	*Earnings opacity*	0.129	0.566	-0.316	-0.059	-0.182	0.009	-0.230	0.212	-0.057	0.016	-0.103	1.000

This table presents the correlation matrix for the variables used in this study. Variable definitions are presented in Appendix A.

Table 4
Societal secrecy and IPO first-day returns: Baseline regression analysis

Dependent variable	*First-day return*		*First-day return*		*First-day return*	
	(1)		(2)		(3)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.0831	3.55	0.0559	2.44	0.1581	3.88
Offer size			-0.1006	-10.41	-0.1077	-11.30
Underwriter			0.2631	5.02	0.2266	4.20
Bookbuilding			0.0054	0.18	0.0172	0.62
SOE			0.1810	3.00	0.1919	3.19
Equity carve-out			0.1050	2.83	0.0953	2.59
IPO activity					2.2342	8.11
Market return					1.2729	2.33
Public enforce					0.0232	0.41
Disclosure					-0.0376	-2.09
Earnings opacity					0.1083	1.78
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Obs.	18,304		18,304		18,304	
Adjusted R^2	0.1235		0.1365		0.1477	

This table presents the regression results for the relation between societal secrecy and IPO first-day returns. The regressions are performed by OLS, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustering at the industry–year level. The intercept is included in all the regressions, but not reported here. Variable definitions are presented in Appendix A.

Table 5
Societal secrecy and IPO first-day returns: Channel effects

	Information asymmetry		Demand for control		Information cascade	
Dependent variable	*First-day return*		*First-day return*		*First-day return*	
	(1)		(2)		(3)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
S_ACons (Predicted)	0.2796	2.82				
S_ACons (Other)	0.0886	1.22				
S_DCont (Predicted)			0.2344	3.06		
S_DCont (Other)			0.1446	2.28		
S_MVol (Predicted)					0.1666	3.58
S_MVol (Other)					0.1575	1.13
Offer size	-0.0920	-9.17	-0.1085	-11.56	-0.1077	-11.12
Underwriter	0.2948	4.12	0.2155	4.08	0.2266	4.31
Bookbuilding	0.0087	0.27	0.0178	0.62	0.0172	0.64
SOE	0.1960	2.70	0.1935	3.33	0.1920	3.21
Equity carve-out	-0.0165	-0.53	0.0972	2.68	0.0952	2.59
IPO activity	4.3083	8.55	2.2191	7.58	2.2341	7.83
Market return	1.6385	2.28	1.2981	2.29	1.2718	2.30
Public enforce	0.1561	2.59	-0.0116	-0.16	0.0229	0.41
Disclosure	-0.0082	-0.20	-0.0468	-1.93	-0.0373	-1.94
Earnings opacity	0.3267	4.30	0.0988	1.39	0.1089	1.73
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Obs.	11,978		17,990		18,304	
Adjusted R^2	0.1643		0.1453		0.1452	

This table presents the regression results for tests on the channels through which societal secrecy affects IPO underpricing. The regressions are performed by OLS. Because the main independent variables in these tests are estimated values, we use the bootstrap resampling technique (1,000 times) for determining the standard errors of the *t*-statistics. The intercept is included in all the regressions, but not reported here. Variable definitions are presented in Appendix A.

Table 6

Societal secrecy and IPO first-day returns: Effect of country institutions

Dependent variable	*First-day return*		*First-day return*		*First-day return*		*First-day return*		*First-day return*	
	(1)		(2)		(3)		(4)		(5)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.3776	2.92	0.3419	5.41	3.1015	5.11	0.9991	4.58	0.1183	2.34
Secrecy×Rule of law	-0.1914	-2.05								
Rule of law	0.1202	1.49								
Secrecy×Civil law			0.1977	2.53						
Civil law			-0.0900	-1.14						
Secrecy×Trade openness					-0.7927	-4.91				
Trade openness					0.5934	5.29				
Secrecy×FDI openness							-0.2203	-3.94		
FDI openness							0.2045	4.66		
Secrecy×Emerging									0.5962	3.12
Emerging									-0.5187	-2.78
Offer size	-0.1102	-11.56	-0.0990	-10.94	-0.1110	-11.49	-0.1068	-11.46	-0.1108	-11.30
Underwriter	0.2276	4.24	0.2379	4.38	0.2487	4.56	0.2460	4.52	0.2248	4.19
Bookbuilding	0.0364	1.22	0.0296	1.04	0.0428	1.52	0.0342	1.25	0.0286	1.02
SOE	0.1941	3.23	0.1950	3.25	0.1868	3.16	0.1866	3.14	0.2010	3.35
Equity carve-out	0.0950	2.55	0.0895	2.45	0.0936	2.57	0.0966	2.65	0.0930	2.49
IPO activity	2.1605	7.66	2.4752	8.79	2.2327	7.88	2.2701	7.82	2.1868	7.92
Market return	1.2282	2.28	1.3323	2.44	1.2061	2.24	1.2923	2.39	1.2667	2.34
Public enforce	-0.0191	-0.25	-0.1664	-2.52	0.0982	1.72	0.0275	0.51	-0.0296	-0.41
Disclosure	-0.0263	-1.24	-0.0620	-3.23	-0.0161	-0.88	-0.0320	-1.72	-0.0078	-0.32
Earnings opacity	0.1637	3.00	0.0110	0.14	0.3048	5.40	0.0797	1.41	0.1640	2.82
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes	
Obs.	18,304		18,304		18,304		18,304		18,304	
Adjusted R^2	0.1483		0.1503		0.1515		0.1492		0.1486	

This table presents the regression results for the effect of country institutions on the relation between societal secrecy and IPO first-day returns. The regressions are performed by OLS, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustering at the industry–year level. The intercept is included in all the regressions, but not reported here. Variable definitions are presented in Appendix A.

Table 7
Societal secrecy and IPO first-day returns: Effect of IPO certification

Dependent variable	*First-day return*		*First-day return*		*First-day return*	
	(1)		(2)		(3)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.1692	4.15	0.1847	4.54	0.1686	4.16
Secrecy×Underwriter	-0.2011	-2.39				
Secrecy×Big 4 auditor			-0.1190	-2.18		
Big 4 auditor			0.1418	3.18		
Secrecy×VC back					-0.1657	-2.17
VC back					0.1984	2.94
Offer size	-0.1106	-11.29	-0.1161	-11.13	-0.1117	-11.44
Underwriter	0.3389	3.88	0.2093	3.89	0.2182	4.05
Bookbuilding	0.0158	0.57	0.0123	0.43	0.0128	0.47
SOE	0.1959	3.26	0.1944	3.20	0.1935	3.22
Equity carve-out	0.0945	2.57	0.0931	2.53	0.0957	2.60
IPO activity	2.2177	8.05	2.2032	7.86	2.2286	8.10
Market return	1.2686	2.33	1.2787	2.35	1.2754	2.34
Public enforce	-0.0042	-0.07	0.0031	0.05	0.0159	0.28
Disclosure	-0.0346	-1.91	-0.0334	-1.84	-0.0374	-2.07
Earnings opacity	0.0814	1.33	0.0592	0.95	0.0979	1.59
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Obs.	18,304		18,304		18,304	
Adjusted R^2	0.1482		0.1484		0.1483	

This table presents the regression results for the effect of IPO certification on the relation between societal secrecy and IPO first-day returns. The regressions are performed by OLS, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustering at the industry–year level. The intercept is included in all the regressions, but not reported here. Variable definitions are presented in Appendix A.

Table 8
Societal secrecy and IPO first-day returns: Robustness checks

Panel A: Alternative secrecy measures

	Secrecy defined as uncertainty avoidance minus individualism		*Secrecy* defined as embeddedness minus egalitarianism	
Dependent variable	*First-day return*		*First-day return*	
	(1)		(2)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.3010	5.13	0.1099	3.04
Controls	Yes		Yes	
Industry Fixed Effects	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Obs.	18,304		18,304	
Adjusted R^2	0.1490		0.1473	

Panel B: Alternative IPO underpricing measure

	First-day return defined as IPO first-day return minus the listing-day market return	
Dependent variable	*First-day return*	
	(1)	
	Coeff.	*t*-Stat.
Secrecy	0.1565	3.83
Controls	Yes	
Industry Fixed Effects	Yes	
Year Fixed Effects	Yes	
Obs.	18,304	
Adjusted R^2	0.1461	

Panel C: Alternative model estimations

	Standard error clustered at country–year level		Including firm commitment	
Dependent variable	*First-day return*		*First-day return*	
	(1)		(2)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.1581	2.79	0.1302	2.51
Secrecy×Bookbuilding			-0.0180	-0.37
Bookbuilding			0.0458	1.16
Secrecy×Firm commitment			0.0956	1.56
Firm commitment			-0.1411	-3.72
Controls	Yes		Yes	
Industry Fixed Effects	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Obs.	18,304		18,304	
Adjusted R^2	0.1477		0.1484	

Panel D: Alternative samples

	Country-level analysis		Global IPOs		Foreign IPOs	
Dependent variable	*First-day return*		*Difference in First-day return adjusted for market return*		*First-day return*	
	(1)		(2)		(3)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.3051	2.32			0.4119	2.04
Difference in Secrecy			0.3017	2.50		
Controls	Yes		Yes		Yes	
Industry Fixed Effects	No		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Obs.	858		414		1,456	
Adjusted R^2	0.0898		0.1690		0.0865	

Panel E: Controlling for other cultural values

Dependent variable	*First-day return*		*First-day return*		*First-day return*	
	(1)		(2)		(3)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.1031	2.37	0.1031	2.37	0.1031	2.37
Adj. IDV			-0.7906	-6.19	-1.7731	-6.36
Adj. UAI	-0.7906	-6.19			0.9825	4.28
Adj. PDI	-1.7731	-6.36	-0.9825	-4.28		
MAS	0.4957	4.56	0.4957	4.56	0.4957	4.56
Controls	Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Obs.	18,304		18,304		18,304	
Adjusted R^2	0.1546		0.1546		0.1546	

Panel F: Controlling for additional variables

Dependent variable	*First-day return*		*First-day return*		*First-day return*	
	(1)		(2)		(3)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.1599	3.89	0.1691	3.89	0.1185	2.81
Anti-director rights	0.0143	1.07				
Creditor rights			0.0145	0.94		
Democracy					-0.0177	-2.94
Controls	Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Obs.	18,304		18,304		17,529	
Adjusted R^2	0.1478		0.1478		0.1490	

Dependent variable	*First-day return*		*First-day return*		*First-day return*	
	(4)		(5)		(6)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.1583	3.43	0.1141	2.40	0.0939	1.86
Property rights	0.0014	0.01				
ACons			-0.3110	-1.31		
Media coverage					-0.0175	-2.22
Controls	Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Obs.	18,304		11,978		8,584	
Adjusted R^2	0.1477		0.1543		0.2091	

Dependent variable	*First-day return*		*First-day return*		*First-day return*	
	(7)		(8)		(9)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
Secrecy	0.1600	3.17	0.1206	2.29	0.1512	3.09
Market integration	-0.1215	-1.69				
Rule of law			-0.0490	-1.13		
Corruption perception					-0.0030	-0.25
Controls	Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
Obs.	17,266		18,304		18,304	
Adjusted R^2	0.1550		0.1479		0.1477	

This table presents the regression results for the robustness tests. The results are presented across six panels and are performed by OLS. Unless otherwise specified, the *t*-statistics are computed using standard errors robust to heteroskedasticity and clustering at the industry–year level. The intercept is included in all the regressions, but not reported here. Variable definitions are presented in Appendix A.

Table 9
Societal secrecy and IPO first-day returns: Instrumental variable analysis

	First-stage regression		Second-stage regression	
Dependent variable	*Secrecy*		*First-day return*	
	(1)		(2)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
FST Denmark	0.7679	102.02		
FST Mexico	-0.2064	-8.68		
Fitted Secrecy			0.2165	3.67
Offer size	-0.0222	-16.35	-0.1071	-11.68
Underwriter	-0.0125	-2.64	0.2272	5.19
Bookbuilding	0.0201	4.42	0.0172	0.67
SOE	0.0411	5.48	0.1901	3.50
Equity carve-out	0.0101	2.05	0.0940	2.71
IPO activity	-0.6128	-21.38	2.2885	9.60
Market return	0.1698	3.84	1.2689	3.16
Public enforce	-0.2692	-24.44	0.0494	1.04
Disclosure	-0.2387	-27.43	-0.0492	-2.80
Earnings opacity	0.0575	29.73	0.1204	2.31
Industry Fixed Effects	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Obs.	18,304		18,304	
Adjusted R^2	0.7844		0.1475	
Excluded IV Test				
F-Statistics	5213.58			
Prob.	0.000			
Hansen–Sargan				
Chi-sq	1.81			
Prob.	0.1784			

This table presents the regression results for the instrumental variable analysis. The regressions are performed by two-stage least squares, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustering at the industry–year level. The intercept is included in all the regressions, but not reported here. Variable definitions are presented in Appendix A.