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## **Does the legal system affect the cost of external financing? Evidence from IPO underpricing of foreign firms listed in US stock markets**

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**Abstract:** To study the effect of the legal system on the cost of external financing, we examine the degree of underpricing of the IPOs by foreign companies listed in the USA. We find that firms from highly corrupted countries have larger IPO underpricing. The quality of the home countries' public law enforcement reduces the degree of IPO underpricing. In particular, the criminal sanction for violations of securities laws is the most significant factor in reducing underpricing. The evidence shows that even when a non-US firm meets sophisticated US regulations and goes public in a US exchange, the degree of underpricing is still influenced by the legal and judicial system in the home country. Following La Porta et al. (2000a), we provide evidence against the functional convergence hypothesis (Coffee, 1999 and 2002).

**Keywords:** IPO; underpricing; functional convergence hypothesis; law and finance.

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## 1 Introduction

At a certain stage of its life cycle, a company may have to resort to external financing. One form of raising capital externally is to sell stocks to investors through initial public offering (IPO). Raising capital through an IPO is a corporate milestone that may help position a firm for future growth and strengthen its competitive position. However, conducting an IPO is an expensive and time consuming process. Underpricing is the best-known cost associated with IPO. Ritter (1987) documents that underpricing is the highest cost in the IPO process and exists in every nation and every stock market (Ritter, 1998). There are different theoretical perspectives to address the IPO underpricing phenomenon. However, studies focusing on the legal reasons of IPO underpricing still remain scarce, so understanding the factors that influence underpricing across firms and across countries helps shed light on firms' decisions to go public.

Law and finance literature suggest that legal systems do have important effects in corporate finance. Researchers have shown that the different legal systems across countries affect financial market development (La Porta et al., 1997, 2006; Djankov et al., 2008), corporate governance (La Porta et al., 2000a), dividend policy (La Porta et al., 2000b), corporate valuation (La Porta et al., 2002) and market cost of equity (Bhattacharya and Daouk, 2002). Related to IPO, Boulton et al. (2010) posit that strong legal system is a double-edged sword for firms raising external financing through IPO. Whereas strong legal systems make it easier to raise capital, they also strengthen the position of outside investors, leading to reduced entrepreneurs' control on their companies. However, it's also questionable that outsiders will exercise the rights granted to them by the legal system when they have low ownership in the company. At the IPO, insiders can generate excess demand from outsiders by underpricing and that excess demand may lead to a more dispersed ownership structure with less active monitoring by outside investors. Consistent with this conjecture, Boulton et al. (2010) find that underpricing is higher when firms go public in a country with a stronger legal system.

However, Engelen and Van Essen (2010) suggest, strong legal systems decrease ex ante uncertainty by reducing investors' fear of expropriation, strong legal systems might be associated with lower underpricing. Peng and Jiang (2010) argue that in countries with better investor protection, the benefits of concentrated family ownership may outweigh the costs and firms with concentrated family ownership have little need to underprice shares at the IPO to maintain control. Because these views are not mutually exclusive, the ultimate impact of legal systems on underpricing remains an empirical issue.

On the other hand, over the past few decades, many foreign companies made their IPO debuts in the United States. While such listings provide a more convenient channel to achieve global diversification, previous studies in the literature show that foreign firms also benefit. For example, Bruner et al. (2004) show that foreign firms making IPOs in the US experience approximately the same underpricing as US domestic IPOs. They argue that the risk of foreign IPOs arising from asymmetric information and high country risk are offset by characteristics that reduce their risk relative to US domestic IPOs. Bruner et al. (2006) further show that there is no significant difference in underpricing between emerging and developed market IPOs made in the US.

The IPO literature also provides evidence that some offer- and firm-specific characteristics such as industry and size affect valuation (e.g., Aggarwal et al., 2009). In particular, Doidge et al. (2004), document that companies from around the world that cross list in US are associated with valuation premiums relative to other firms from their

home countries that do not cross list. Their results are consistent with the functional convergence hypothesis (Coffee, 1999; 2002).

Unlike Doidge et al. (2004), this study attempts to investigate what determine the valuation of US-listed foreign IPOs. Specifically, it investigates whether some commonly used country-level legal variables affect the cross-section of IPO valuation.

We analyse a sample of 364 non-US firms' IPOs (including ADR/ADS IPOs) in the US exchange markets from 1991 to 2008. The empirical results suggest that IPOs for firms from highly corrupted countries are associated with more underpricing. With respect to legal enforcement, we find that IPO underpricing is lower if the home country has more efficient public law enforcement. Among the five components of the public law enforcement, criminal sanction is the most significant factor in reducing the IPO underpricing. The association between IPO underpricing and the home-country's private law enforcement, however, tends to be statistically insignificant. We do not find a significant relationship between IPO underpricing and the home-country's legal protection level. One possible explanation is investors assess whether the home-country's legal system effectively takes actions against expropriations of shareholders, while the presence of legal protection rules does not warrant, by itself, that there will be actions taken by the judiciary in that specific country. As far as legal origins are concerned, we find that, compared to other legal origins, the IPOs from the German civil law countries, which provide weak shareholder protection, have significantly larger underpricing. For IPOs from common law countries, the underpricing is lower, but the result is not statistically significant. This result weakly supports La Porta et al. (1998) that common law countries have stronger investor protections.

We contribute to the literature in the following two ways. First, we provide new evidence in law and finance literature by showing the influence of legal framework from the home country on those foreign firms' IPOs in the US. In addition, following La Porta et al. (2000a), we provide evidence against the functional convergence hypothesis (Coffee, 1999; 2002). Even though the non-US firms meet the sophisticated US IPO regulations and requirements, their IPO underpricing is still influenced by the home-country's legal and judicial systems.

The paper is organised as follows. In Section 2, we review the related literature. Section 3 presents the research design and methodology. Section 4 discusses sample selection and descriptive statistics. We discuss the empirical results in Section 5. Section 6 concludes the paper.

## **2 Literature review**

### *2.1 Law and finance*

Researchers have long realised the importance of the legal system in corporate finance. For example, Jensen and Meckling (1976) suggests that "The firm is not an individual. It is a legal fiction ...". In Footnote 14, they also add: "This view of the firm points up the important role which the legal system and the law play in social organisations, especially, the organisation of economic activity". However, the crucial assumption in the traditional 'law and economics' perspective that the juridical system perfectly protects shareholders and enforces elaborate contracts cannot be taken for granted in many countries. (La Porta et al. 2000a).

La Porta et al. (1997, 1998) emphasise that law does matter. La Porta et al. (1998) investigate 49 countries, categorised on the basis of the origins of their respective legal framework, with regards to the legal protection and the law enforcement. They find that legal rules systematically vary across countries with different legal origins. Judicial systems most favourable to shareholders, they indicate, are the ones found in countries with common law framework. Common law countries provide the best shareholder protection, while Scandinavian civil law countries offer the best law enforcement. La Porta et al. (1997) show that the legal system is a strong predictor of capital market development. Common law countries have the strongest investor protection and the most developed capital markets. On the contrary, countries with lower investor protection have smaller and narrower capital markets. In particular, the French civil law countries have the weakest investor protection and the least developed capital markets.

Following La Porta et al. (1997, 1998), researchers have investigated the differences in legal frameworks and how they affect different issues in corporate finance. Both La Porta et al. (2002) and Shleifer and Wolfenzon (2002) introduce theoretical models to study the effects of legal protection. In a model of a one-entrepreneur-controlled firm, La Porta et al. (2002) theoretically verify that:

- 1 countries with better shareholder protection have less expropriation of minority shareholders
- 2 higher cash-flow (e.g., dividends) ownership is associated with less expropriation of minority shareholders.

Shleifer and Wolfenzon (2002) present a market equilibrium model to assess an entrepreneur's decision to go public and how such a decision may be shaped by the legal environment.

These theoretical models are supplemented with empirical studies which examine the relationship between law and finance. For instance, La Porta et al. (2000a) empirically demonstrate that legal protection for outside investors influences corporate governance in three major domains: ownership structure, financial market development and resource allocation. For the dividend policy, by using the investor protection quality as a proxy for agency cost level, La Porta et al. (2000b) find that in countries with better legal protection schemes for minority shareholders, firms pay higher dividends. Moreover, legally better protected shareholders are willing to trade the dividends for better investment opportunities, while poorly protected shareholders would take the dividends regardless of the future investment opportunities. In regard to financial market development, La Porta et al. (2006) find that private enforcement plays a more important role than does public enforcement in the development of stock markets. Djankov et al. (2008) introduce the anti-self-dealing index as a new measure of the legal protection of minority shareholders. Bhattacharya and Daouk (2002) indicate that the enforcement of insider trading laws is associated with a reduction in the market cost of equity, while the existence of insider trading laws does not affect the cost of equity.

## *2.2 IPO Underpricing*

Researchers have introduced different explanations for the IPO underpricing phenomenon. Most of the theoretical explanations are based on information asymmetries among market participants (Merton, 1987), though these approaches differ in the

assumptions about which market participants have superior information to others. Rock (1986) proposes an adverse selection model, in which IPO underpricing is needed to maintain demands from uninformed traders. However, Rock's model does not address the role of the degree of uncertainty ('ex ante uncertainty') and the underwriter's reputation, something that Beatty and Ritter (1986) and Carter and Manaster (1990) have introduced. Baron (1982) applies a principal-agent model to IPO underpricing with the assumption that the underwriters (agents) have information superior to that of the issuers (principals). The issuer underprices its shares to reduce the costs associated with soliciting honest advising from the underwriter. Benveniste and Spindt (1989) emphasise the role of information acquisition by investment bankers through 'presale solicitations of interest'. In their auction mechanism, underpricing is a way of compensating regular investors for revealing the private information. Leland and Pyle (1977) introduce the signalling model, which assumes the firm's value is known to the issuer but not to investors. High-value firms use IPO underpricing as a signal to convince investors of their good quality. These firms will benefit from higher prices in seasoned offerings of additional shares in the future.

With globalisation, companies can list their equity shares on foreign stock exchanges to gain access to additional external financing. Investors face higher informational uncertainty when dealing with firms from countries other than theirs. Researchers have applied different information asymmetry models to explain foreign firms' IPO underpricing. Francis et al. (2010), Blass and Yafeh (2001), Ejara and Ghosh (2004) and Bell et al. (2008) present evidence that various information asymmetry factors (e.g., market segmentation, investor recognition and signalling of superior quality) affect foreign firms' IPO underpricing in US stock markets. However, none of these studies look at how a country's legal environment affects information asymmetry among different concerned parties.

### *2.3 The functional convergence hypothesis*

Closely related with the study of law and finance, the functional convergence hypotheses (Coffee, 1999; 2002; Fuerst, 1998; Stulz, 1999) argue that US laws covering US-listed foreign firms can potentially deter insiders from engaging in fraud and embezzlement in spite of the home country's weak legal institutions. However, La Porta et al. (2000a), argue that though 'functional convergence' may play a role in improving investor protection, "such listing imposes only limited constraints on the insiders: although it improves disclosure, it typically does not give minority shareholders many effective rights". They also argue that another limitation of the functional convergence is that assets located in foreign countries generally remain under the jurisdiction of these countries' laws. Therefore, it is hard to protect the creditor rights if those countries have weak legal protection regimes.

Literature provides mixed evidence for the functional convergence hypothesis. Mitton (2002) adopts ADR issuance to proxy disclosure quality and studies the performance of 398 firms from five Asian countries during the 1997–1998 East Asian financial crisis. He finds evidence to support the argument that firms may opt for legal regimes that are more protective of minority shareholder rights if a country's legal environment fails to protect these minority shareholders. Reese and Weisbach (2002) examine the hypothesis whether non-US firms cross-list in the US to increase minority shareholder protection. They

conclude that the desire to protect shareholder rights is one reason for cross-listing. Doidge et al. (2004) find that the US listing reduces the controlling shareholders' expropriation and thereby boosts opportunities for corporate growth (Tobin's  $q$ ). Doidge (2004) examines 745 non-US firms with a dual-class share structure. The empirical result is consistent with the notion that cross-listing in the US increases firm value because it decreases the private benefits of control.

However, we also find evidence against the functional convergence hypothesis. Siegel (2005) provides empirical evidence that the US securities and exchange commission (SEC) actually does not effectively enforce the law against cross-listed foreign firms. Fanto (1996) points out that the SEC failed to strictly realise the information disclosure requirements for foreign firms. Licht (2000) introduces the concept of managerial opportunism, which could play a significant role in foreign listing decisions. It is, therefore, difficult to claim explicitly that foreign listing is beneficial. Licht (2003) argues that the bonding role of cross-listing is greatly overstated because the regulatory regime to foreign issuers differs from the regime applied to domestic US issuers. He finds that the foreign issuer regime 'cuts corners' on the issues of corporate governance relating to corporate insiders. The SEC complements this 'cutting corner' strategy with a 'hands-off' informal policy of non-enforcement toward foreign issuers.

### **3 Hypotheses and research design**

This study attempts to fill the gap in literature by extending the law and finance literature to IPO underpricing to investigate how a country's legal institutions determine a firm's cost of raising equity capital in the international market. In particular, we focus on the impact of the home country's legal system on the underpricing of non-US firms' IPOs in the US stock exchanges.

When a foreign firm takes an IPO in the US, the 'ex ante uncertainty' (Beatty and Ritter, 1986) could be greater because it now includes both firm-level and macro-factors of the home country. We expect the attributes of the home country's legal system to provide valuable information on the 'ex ante uncertainty' concerning the value of the IPO issuer. In other words, we expect that firms from countries with better legal qualities could reduce financing costs (e.g., lower degree of IPO underpricing) in the sense that an efficient home-country's legal framework will help to reduce the 'ex ante uncertainty' associated with information asymmetry models.

Law and finance literature introduce various measures of the country-level legal variables (La Porta et al., 1998; 2006; Bhattacharya and Daouk, 2002; Djankov et al., 2008). For the purposes of our analysis, we categorise these variables into three groups:

- 1 variables measuring law enforcement
- 2 variables measuring investor protection
- 3 legal origins.

**Table 1** Description of the variables

Variable	Description	Data source
1 Law enforcement		
1.1 Corruption	The corruption perception index (CPI) from Transparency International ( <a href="http://www.transparency.org">www.transparency.org</a> ). Scale from 0 to 10. Higher scores represent less corruption.	<a href="http://www.transparency.org">www.transparency.org</a>
1.2 Disclosure requirement index	An index averaging five sub-indices representing disclosure requirements. Scale from 0 to 1. Higher scores represent cheaper costs for investors to recover damages.	La Porta, Lopez-De-Silanes and Shleifer (2006) 'What works in Securities Laws', <i>The Journal of Finance</i>
1.3 Liability standard index	An index averaging four sub-indices representing liability standards. Scale from 0 to 1. Higher score represent easier for investors to recover damages.	La Porta, Lopez-De-Silanes and Shleifer (2006) 'What works in Securities Laws', <i>The Journal of Finance</i>
1.4 Public enforcement index	An index averaging five sub-indices representing public enforcement. Scale from 0 to 1. Higher scores represent better public enforcement.	La Porta, Lopez-De-Silanes and Shleifer (2006) 'What works in Securities Laws', <i>The Journal of Finance</i>
	a supervisor characteristics index	
	b rule-making power index	
	c investigative powers index	
	d orders index	
	e criminal sanction index	
1.5 Insider-trading law enforcement dummy	A dummy (it_en, dummy) that equals to 1 in the years during and after the initial enforcement of insider trading laws and 0 in all prior years.	Bhattacharya and Daouk (2002) 'The world price of insider trading', <i>The Journal of Finance</i>
1.6 Efficiency of judicial system	Assessment of the efficiency and integrity of the legal environment. Scale from 0 to 10. Higher scores represent higher efficiency levels.	La Porta, Lopez-De-Silanes and Shleifer (2008) 'The economic consequences of legal origins', <i>Journal of Economic Literature</i>
1.7 Lg (GDP per capita)	The logarithm of the home country's GDP per capita, where GDP per capita is the average of the country's GDP per capita from 1980 to 2004.	La Porta, Lopez-De-Silanes and Shleifer (2008) 'The economic consequences of legal origins', <i>Journal of Economic Literature</i>
2 Investor protection		
2.1 Anti-director rights index	An index aggregating the shareholder rights. The variable (antidir) ranges from 0 to 6. Higher value represents better shareholder protection.	La Porta, Lopez-De-Silanes and Shleifer (2006) 'What works in Securities Laws', <i>The Journal of Finance</i>
2.3 Creditor rights index	An index aggregating different creditor rights. The variable (cr) ranges from 0 to 4. Higher value represents better creditor protection.	La Porta, Lopez-De-Silanes and Shleifer (2008) 'The economic consequences of legal origins', <i>Journal of Economic Literature</i>
2.2 Anti-self-dealing index	An index averaging the ex ante private control of self-dealing and the ex post private control of self-dealing. The variable (antisd) ranges from 0 to 1. Higher value represents better control of self-dealing.	Djankov, La Porta, Lopez-De-Silanes and Shleifer (2008) 'The law and economics of self-dealing', <i>Journal of Financial Economics</i>
2.4 Insider-trading law existence dummy	A dummy (it_ex, dummy) that equals to 1 in the years during and after the insider trading laws were established and 0 in all prior years.	Bhattacharya and Daouk (2002) 'The world price of insider trading', <i>The Journal of Finance</i>
3 Legal origin	The legal origin of the security law, company law or commercial code of each country.	La Porta, Lopez-De-Silanes and Shleifer (2008) 'The economic consequences of legal origins', <i>Journal of Economic Literature</i>
	a Legor_uk: equals 1 if origin is English common law, 0 if not.	
	b Legor_fr: equals 1 if origin is French civil law, 0 if not.	
	c Legor_gc: equals 1 if origin is German civil law, 0 if not.	
	d Legor_sc: equals 1 if origin is Scandinavian civil law, 0 if not.	
	e Legor_so: equals 1 if origin is Socialist common law, 0 if not.	

**Table 1** Description of the variables (continued)

<i>Panel B. Firm and offer characteristics variables</i>		
<i>Variable</i>	<i>Description</i>	<i>Data source</i>
1 IPO Underpricing	First trading day return	SDC data and CRSP data
2 Control variables		
2.1 IPO size	The logarithm of the IPO principal amount	SDC data
2.2 Lead underwriter rank	The variable (UW_rank) represents the lead underwriter reputation rank.	SDC data and Jay Ritter (underwriter_rank8009.xls)
2.3 Number of underwriters	The number of underwriters	SDC data
2.4 NASDQ dummy	A dummy that equals to 1 if the exchange to be listed is NASDAQ and 0 if not (in NYSE or AMEX).	SDC data
2.5 High-tech. dummy	A dummy that equals to 1 if firm is a high-tech company. (High-tech industries are with SIC codes: 3571, 3572, 3575, 3577, 3578, 3661, 3663, 3669, 3674, 3812, 3823, 3825, 3826, 3827, 3829, 4899, 7370, 7371, 7372, 7374, 7375, 7378 and 7379.)	SDC data
2.6 Emerging market dummy	A dummy that equals to 1 if the country is an emerging market, 0 if not	Bhattacharya and Daouk (2002) 'The world price of insider trading', <i>The Journal of Finance</i>



We formulate the following hypothesis:

- Hypothesis 1 There is a negative relationship between the home-country law enforcement and IPO underpricing in the US market.
- Hypothesis 2 There is a negative relationship between the home-country investor protection and IPO underpricing in the US market.
- Hypothesis 3 Companies from civil law countries have larger IPO underpricing.

In addition, this study also provides an ideal setting to test the functional convergence hypothesis. The functional convergence hypothesis argues that foreign firms traded in the US markets are subject to regulations by US legal institutions, which can potentially deter insiders from engaging in fraud activities regardless of how inefficient the home-country legal framework may be. Therefore, the functional convergence hypothesis predicts no influence from the issuer's native legal framework to the IPO underpricing in the US market if the US legal institutions fully neutralise the effects of the home country's different legal environment and vice versa.

To test our hypotheses, we run fixed effects regressions by including both the country-level legal system variables and the firm-specific variables.

$$\text{Underpricing}_i = a_0 + B \cdot X_i + C \cdot Y_i + \varepsilon_i \quad (1)$$

where  $\text{Underpricing}_i$  is the dependent variable, representing company  $i$ 's IPO underpricing. Underpricing is the price change measured from the IPO offering price to the market closing price on the first trading day.  $X_i$  is the vector of independent variables measuring the quality of company  $i$ 's home-country legal framework.  $Y_i$  is the vector of control variables measuring the firm-specific factors. All the variables are defined in Table 1. Panel A presents the country-level legal quality variables. Panel B shows variables related to the firm and offer features.

#### 4 Data source and sample construction

We obtain foreign IPO data from 1991 to 2008 from two sources. The first source is the security data company's (SDC) new issue database. The second source is the ADR/ADS data from BNY Mellon, Citibank, Deutsche Bank and JP Morgan Chase. We do not include data from earlier years because foreign IPO data prior to 1991 are scarce.

We include only IPOs listed on NYSE, NASDAQ and AMEX in our sample. We exclude firms incorporated in US, closed-end funds, real estate investment trusts (REITs) and those IPOs with an offer price lower than \$5. Moreover, for the ADR/ADS data, we exclude both Level I and Level II ADRs. Level I ADRs are not required to meet the SEC requirements or the US GAAP rules. Level II ADRs cannot raise new equity in the US markets. We also examine the issuers' filing information with the SEC to ensure that the Level III ADRs are initially traded either in the US only or in both the US and the home country simultaneously. We further exclude IPOs from countries where information about the respective legal system is lacking or inaccessible. The final sample size contains 364 IPOs from 1991 through 2008.

Table 2 summarises the descriptive statistics of the variables. Our sample includes 364 foreign firms’ IPOs from 36 nations/regions. Panel A classifies countries by legal origin and presents means for the key variables. It shows that common law countries have better legal protection and better private law enforcement than civil law countries. In public law enforcement measures, common law countries have higher public enforcement indexes and less corruption (CPI) than civil law nations, though the Scandinavian civil law nations have the least corruption. Panel A indicates that the legal protection variables and the law enforcement variables are not necessarily correlated with each other. Panel B presents the descriptive statistics by nation. The average offer size is \$141.99 million. The average degree of underpricing in our sample is 16%, median is 5% and the standard deviation is 41%. Firms from Japan have the highest average IPO underpricing, 225%, while firms from Switzerland have the lowest, -16%.

**Figure 1** Distributions of foreign IPOs in the US (left y-axis) and US IPOs (right y-axis) across time (see online version for colours)

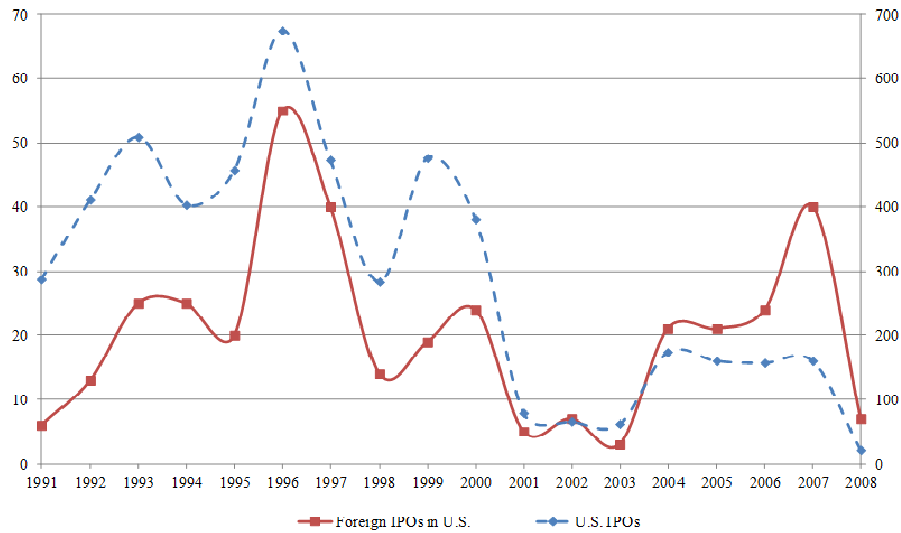


Table 3 summarises the descriptive statistics of the variables by year. The highest average IPO initial return is in 2000, 70%, while the lowest average IPO initial return is in 2008, -1%. This is consistent with the IPO ‘hot issue year’ phenomenon. The number of IPOs fluctuates over time. In Figure 1, we compare the number of IPOs by non-US firms with the number of IPOs by US firms for the period from 1991 to 2008. Both have similar fluctuation patterns over the study period. For the firm and offer variables, 62% of IPOs are listed in the NASDAQ market; 35% of issuers are high-tech companies; the average lead underwriter rank is 7.97; the average number of underwriters is 6.58; and 52% of issuers are from an emerging market.

**Table 2** Descriptive statistics of variables

*Panel A: This table classifies 364 foreign IPOs in the US market from 1991 to 2008 by nation and reports the variables for each country including (1) IPO underpricing (2) Home-country legal system and (3) Firm- or offer-specific variables.*

Nation	Number of IPOs	Dependent variables (IPO underpricing)			Independent variables (country-level legal system variables)										
		Mean	Median	Std. dev.	Legal origin (1 = UK, 2 = FR, 3 = GE, 4 = SC)	Anti-director index	Creditor protection index	Anti-self-dealing index	First insider-trading law existence year	Disclosure requirement index	Liability standard index	Public enforcement index	Corruption (CPI) (mean)	Corruption (CPI) (std. dev.)	First insider-trading law enforcement year
Argentina	6	0.329	0.130	0.423	2	4	1	0.340	1991	0.500	0.220	0.583	2.884	0.079	1995
Australia	3	0.052	0.050	0.054	1	4	3	0.760	1991	0.750	0.660	0.900	8.753	0.136	1996
Belgium	3	0.270	0.342	0.230	2	0	2	0.540	1990	0.417	0.440	0.150	6.313	0.921	1994
Brazil	4	0.036	0.018	0.043	2	3	1	0.270	1976	0.250	0.330	0.583	3.487	0.520	1978
Canada	45	0.179	0.025	0.414	1	5	1	0.640	1966	0.917	1.000	0.800	8.939	0.253	1976
Chile	7	0.039	0.008	0.079	2	5	2	0.630	1981	0.583	0.330	0.600	6.050	0.253	1996
China	66	0.239	0.073	0.602	3	2	2	0.760	1993	0.583	0.553	0.367	3.378	0.203	2007
Denmark	1	0.241	0.241		4	2	3	0.460	1991	0.583	0.553	0.367	3.378	0.203	1996
France	16	0.148	0.026	0.217	2	3	0	0.380	1967	0.750	0.220	0.767	6.829	0.156	1975
Germany	5	0.253	0.042	0.465	3	1	3	0.280	1994	0.417	0.000	0.217	8.008	0.281	1995
Greece	11	-0.002	-0.005	0.063	2	2	1	0.220	1988	0.333	0.495	0.317	4.464	0.266	1996
Hong Kong	18	0.176	0.142	0.239	1	5	4	0.960	1991	0.917	0.660	0.867	7.566	0.506	1994
India	4	0.152	0.161	0.081	1	5	2	0.580	1992	0.917	0.660	0.667	2.900	0.283	1998
Indonesia	1	0.141	0.141		2	2	2	0.650	1991	0.500	0.660	0.617	2.720	0.283	1996
Ireland	8	0.214	0.138	0.253	1	4	1	0.790	1990	0.667	0.440	0.367	8.099	0.416	1996
Israel	53	0.149	0.083	0.220	1	3	3	0.730	1981	0.667	0.660	0.633	7.078	0.679	1989
Italy	6	0.058	0.014	0.085	2	1	2	0.420	1991	0.667	0.220	0.483	4.028	0.974	1996
Japan	2	2.252	2.252	2.674	3	4	2	0.500	1988	0.750	0.660	0.000	6.200	0.283	1990



**Table 2** Descriptive statistics of variables (continued)

Nation	Number of IPOs	IPO size (\$ million) (mean)	IPO size (std. dev.)	Control variables (firm- and offer-specific variables)										Emerging market dummy (1 = emerging market)
				NASDAQ market dummy (mean)	NASDAQ market dummy (std. dev.)	High-tech. IPO dummy (mean)	High-tech. IPO dummy (std. dev.)	Underwriter ranking (mean)	Underwriter ranking (std. dev.)	Number of underwriters (mean)	Number of underwriters (std. dev.)	Underwriter ranking (mean)	Underwriter ranking (std. dev.)	
Argentina	6	374.83	439.06	0.50	0.55	0.17	0.41	9.00	0.00	9.33	6.31	1		
Australia	3	24.38	20.23	0.67	0.58	0.33	0.58	5.67	3.21	4.33	4.93	0		
Belgium	3	40.39	23.65	1.00	0.00	0.33	0.58	8.00	0.00	3.67	0.58	0		
Brazil	4	133.41	173.64	0.25	0.50	0.00	0.00	8.50	0.58	3.50	1.00	1		
Canada	45	116.78	167.99	0.64	0.48	0.40	0.50	7.11	2.54	6.80	5.86	0		
Chile	7	62.07	30.49	0.14	0.38	0.00	0.00	8.57	0.79	4.00	2.31	1		
China	66	147.48	109.76	0.56	0.50	0.41	0.50	8.59	1.29	5.18	5.62	1		
Denmark	1	75.60		1.00		1.00		8.00		2.00		0		
France	16	130.59	170.05	0.63	0.50	0.31	0.48	8.69	0.60	7.19	6.75	0		
Germany	5	642.73	664.38	0.20	0.45	0.60	0.55	9.00	0.00	12.60	13.30	0		
Greece	11	151.21	63.48	0.55	0.52	0.00	0.00	7.91	1.51	7.36	6.50	1		
Hong Kong	18	148.65	283.07	0.61	0.50	0.06	0.24	7.00	3.20	4.17	5.27	0		
India	4	144.92	61.08	0.00	0.00	0.25	0.50	9.00	0.00	5.00	0.00	1		
Indonesia	1	204.75		0.00		0.00		9.00		7.00		1		
Ireland-Rep	8	182.27	226.21	0.75	0.46	0.25	0.46	8.63	0.74	9.00	8.80	0		
Israel	53	44.38	56.68	0.94	0.23	0.62	0.49	6.98	2.46	8.06	8.10	1		
Italy	6	258.73	420.29	0.17	0.41	0.00	0.00	7.83	2.40	10.00	10.20	0		

**Table 2** Descriptive statistics of variables (continued)

Nation	Number of IPOs	Control variables (firm- and offer-specific variables)										
		IPO size (\$ million) (mean)	IPO size (std. dev.)	NASDAQ market dummy (mean)	NASDAQ market dummy (std. dev.)	High-tech, IPO dummy (mean)	High-tech, IPO dummy (std. dev.)	Undewriter ranking (mean)	Undewriter ranking (std. dev.)	Number of underwriters (mean)	Number of underwriters (std. dev.)	Emerging market dummy (1 = emerging market)
Japan	2	116.33	24.36	1.00	0.00	0.50	0.71	9.00	0.00	3.00	0.00	0
Jordan	1	7.00		1.00		0.00		2.00		6.00		1
Luxembourg	3	164.49	148.62	1.00	0.00	0.67	0.58	8.67	0.58	5.67	1.53	0
Mexico	14	155.88	151.24	0.07	0.00	0.00	0.00	8.72	0.47	6.57	7.22	1
Netherlands	21	142.92	138.24	0.71	0.46	0.43	0.51	8.48	1.25	5.76	8.36	0
New Zealand	4	97.03	96.73	0.75	0.50	0.25	0.50	8.75	0.50	7.25	5.91	0
Peru	2	46.50	15.59	0.00	0.00	0.00	0.00	8.00	1.41	3.00	1.41	1
Philippines	2	65.13	12.90	1.00	0.00	0.50	0.71	8.50	0.71	11.50	10.61	1
Portugal	1	114.95		0.00		0.00		9.00		5.00		1
Russian Fed	5	185.34	125.79	0.20	0.45	0.00	0.00	8.40	0.89	4.40	2.07	1
Singapore	6	74.11	45.11	0.50	0.55	0.33	0.52	8.33	0.82	8.33	13.60	0
South Africa	1	120.45		0.00		0.00		9.00		9.00		1
South Korea	5	107.02	56.18	0.80	0.45	0.40	0.55	8.20	1.79	3.20	0.84	1
Spain	1	78.30		1.00		0.00		9.00		3.00		0
Sweden	4	112.68	150.18	0.75	0.50	0.50	0.58	8.75	0.50	6.25	3.77	0
Switzerland	5	785.31	1051.64	0.20	0.45	0.20	0.45	9.00	0.00	11.60	11.10	0
Taiwan	5	307.33	236.40	0.60	0.55	0.80	0.45	9.00	0.00	7.60	6.62	1
UK	24	92.70	110.06	0.88	0.34	0.33	0.48	7.54	1.82	7.21	6.76	0
Venezuela	1	534.39		0.00		0.00		9.00		5.00		1
Total	364	141.99	227.65	0.62	0.49	0.35	0.48	7.97	1.93	6.58	6.82	0.52

Panel B: Descriptive statistics of variables by nation

**Table 3** Descriptive statistics of dependent and control variables by year

Year	Number of IPOs	Dependent variable (IPO underpricing)			Control variables (firm- and offer-specific variables)										
		Mean	Median	Std. dev.	IPO size (\$ million) (mean)	IPO size (\$ million) (std. dev.)	MASDAQ market dummy (mean)	MASDAQ Market dummy (std. dev.)	High-tech. IPO dummy (mean)	High-tech. IPO dummy (std. dev.)	Underwriter ranking (mean)	Underwriter ranking (std. dev.)	Number of underwriters (mean)	Number of underwriters (std. dev.)	Emerging market dummy (1 = emerging market) (mean)
1991	6	0.130	0.166	0.122	102.90	86.00	0.50	0.55	0.33	0.52	7.67	3.27	3.00	1.79	0.50
1992	12	0.102	0.077	0.111	68.62	64.28	0.58	0.51	0.42	0.51	8.75	0.45	3.00	1.76	0.33
1993	25	0.110	0.076	0.142	99.94	239.35	0.44	0.51	0.40	0.50	7.36	2.61	3.12	1.56	0.60
1994	25	0.050	0.004	0.152	113.01	152.57	0.60	0.50	0.24	0.44	7.64	2.40	5.36	8.91	0.40
1995	20	0.161	0.119	0.200	83.74	79.10	0.70	0.47	0.55	0.51	7.60	2.11	3.20	2.14	0.15
1996	55	0.104	0.045	0.162	106.05	230.84	0.67	0.47	0.29	0.46	7.93	1.69	5.40	6.17	0.31
1997	39	0.098	0.063	0.139	86.38	110.16	0.67	0.48	0.23	0.43	7.46	2.30	11.46	8.50	0.38
1998	14	0.120	0.140	0.349	233.65	418.21	0.64	0.50	0.21	0.43	7.72	2.27	12.21	8.03	0.29
1999	19	0.263	0.091	0.347	141.78	264.57	0.79	0.42	0.53	0.51	7.42	2.22	11.11	7.67	0.53
2000	24	0.696	0.236	1.088	124.59	198.23	0.88	0.34	0.54	0.51	7.92	2.00	11.88	10.67	0.42
2001	5	0.113	0.060	0.101	125.96	86.13	0.20	0.45	0.00	0.00	8.00	1.73	11.60	6.77	0.80
2002	7	0.048	0.030	0.056	517.32	804.21	0.00	0.00	0.14	0.38	8.57	0.79	11.43	10.75	0.57
2003	3	0.293	0.000	0.513	66.80	58.55	0.67	0.58	0.33	0.58	8.33	1.15	5.33	4.04	0.67
2004	20	0.103	0.023	0.262	94.33	56.57	0.85	0.37	0.30	0.47	8.10	1.92	4.85	2.39	0.70
2005	21	0.240	0.014	0.773	144.09	135.21	0.76	0.44	0.52	0.51	8.19	1.60	4.24	1.79	0.86
2006	24	0.097	0.076	0.138	302.84	273.15	0.54	0.51	0.42	0.50	8.67	1.24	5.21	2.64	0.63
2007	39	0.170	0.078	0.270	202.32	110.89	0.44	0.50	0.28	0.46	8.77	0.84	4.33	1.75	0.92
2008	6	-0.011	-0.003	0.049	94.62	70.19	0.33	0.52	0.33	0.52	8.00	2.45	3.50	1.52	0.83
Total	364	0.165	0.050	0.409	141.99	227.65	0.62	0.49	0.35	0.48	7.97	1.93	6.58	6.82	0.52

Note: This table classifies 364 foreign IPOs in the US market from 1991 to 2008 by year. The variables include: 1 – IPO underpricing; and 3 – Firm- or offer-specific.

**Table 4** Univariate test on IPO underpricing

<i>Panel A: Different types of security</i>				
<i>Share type</i>	<i>Number of observations</i>	<i>IPO underpricing mean</i>	<i>t-statistic</i>	<i>Pr &gt;  t </i>
ADR/ADS	185	0.166	5.148	< 0.0001
Ordinary/common	179	0.163	5.801	< 0.0001
All	364	0.165	7.685	< 0.0001
<i>Panel: Legal origin</i>				
<i>Legal origin</i>	<i>Number of observations</i>	<i>IPO underpricing mean</i>	<i>t-statistic</i>	<i>Pr &gt;  t </i>
Common – UK	166	0.147	6.895	< 0.0001
Civil – FR	105	0.135	5.848	< 0.0001
Civil – GE	88	0.236	3.201	0.0019
Civil – SC	5	0.109	2.708	0.0537
Civil	198	0.179	5.109	< 0.0001
All	364	0.165	7.685	< 0.0001

Before moving into Section 5, we present the univariate test results in Table 4. Panel A of Table 4 shows that IPO underpricing for both ADR/ADS stocks and ordinary/common stocks are both positive and significant. Panel B of Table 4 reports that for firms from civil law countries, the average IPO underpricing is 17.94%, which is higher than the average IPO underpricing of 14.70% for firms from common law countries. In the sub-sample of issuers from civil law countries, those from German civil law countries have the highest IPO underpricing (mean = 23.63%) and those from Scandinavian civil law countries have the lowest IPO underpricing (mean = 10.86%).

## 5 Empirical test results

### 5.1 IPO underpricing and law enforcement analysis

Our first hypothesis is that IPO underpricing tends to be lower if the issuer's home-country law enforcement is more efficient. Table 5 presents regression results of IPO underpricing on various measures of law enforcement quality.

In Columns 1 and 2, we focus on the measurements of private enforcement – disclosure requirements and liability standards, respectively. Although the results indicate that IPO firms with a better home-country private enforcement experience lower IPO underpricing, the relationship is not statistically significant.



**Table 5** The effects of law enforcement on IPO underpricing

	1	2	3	4	5	6	7	8	9	10	11	12
Disclosure requirement index	-0.135 (-0.75)											0.046 (0.17)
Liability standard index		-0.050 (-0.50)										0.136 (0.94)
Public enforcement index			-0.402*** (-2.66)									-0.570*** (-2.61)
1 Supervisor char. index				-0.059 (-0.76)					-0.039 (-0.37)			
2 Rule-making power index					-0.095 (-1.45)				-0.139* (-1.89)			
3 Investigative power index						-0.101 (-1.18)			-0.087 (-0.68)			
4 (Stop & Do) Orders index							-0.116 (-1.64)		-0.057 (-0.58)			
5 Criminal sanction index								-0.213* (-1.93)	-0.227* (-1.91)			
Corruption (CPI)										-0.060** (-2.03)		-0.074** (-2.26)
Insider trading law enforcement											-0.066 (-0.98)	0.017 (0.16)

Notes: Results of ordinary least squares (OLS) regressions on the effect of law enforcement on IPO underpricing. The sample is 364 foreign IPOs in the US market from 1991 to 2008.

**Table 5** The effects of law enforcement on IPO underpricing (continued)

	1	2	3	4	5	6	7	8	9	10	11	12
Anti-director rights index	0.017 (0.78)	0.011 (0.57)	0.044** (2.03)	0.009 (0.54)	0.007 (0.44)	0.023 (1.06)	0.030 (1.36)	0.018 (1.02)	0.047* (1.90)	0.022 (0.99)	0.008 (0.48)	0.066* (1.92)
Ln(GDP per capita)	-0.018 (-0.34)	-0.012 (-0.23)	-0.010 (-0.18)	0.005 (0.08)	-0.051 (-0.87)	0.000 (-0.00)	0.007 (0.13)	-0.042 (-0.76)	-0.068 (-1.08)	0.013 (0.20)	-0.008 (-0.15)	0.031 (0.47)
Judiciary efficiency	-0.003 (-0.17)	-0.003 (-0.12)	-0.001 (-0.06)	-0.010 (-0.47)	-0.008 (-0.40)	-0.002 (-0.12)	0.002 (0.10)	0.003 (0.15)	0.005 (0.20)	0.033 (1.04)	-0.003 (-0.15)	0.037 (1.13)
Log(size)	0.037 (1.28)	0.040 (1.39)	0.029 (1.01)	0.038 (1.34)	0.041 (1.42)	0.038 (1.31)	0.052 (1.10)	0.033 (1.14)	0.027 (0.94)	0.062* (1.69)	0.040 (1.40)	0.048 (1.29)
NQ dummy	0.078 (1.36)	0.083 (1.44)	0.061 (1.07)	0.078 (1.35)	0.081 (1.42)	0.079 (1.38)	0.073 (1.27)	0.065 (1.13)	0.054 (0.93)	0.117 (1.62)	0.085 (1.49)	0.079 (1.08)
High-tech dummy	0.039 (0.79)	0.039 (0.78)	0.041 (0.84)	0.043 (0.86)	0.024 (0.48)	0.041 (0.82)	0.044 (0.89)	0.034 (0.70)	0.026 (0.51)	0.059 (0.94)	0.045 (0.90)	0.066 (1.05)
Underwriter rank	-0.003 (-0.26)	-0.003 (-0.27)	-0.005 (-0.43)	-0.005 (-0.27)	-0.003 (-0.22)	-0.004 (-0.30)	-0.004 (-0.34)	-0.004 (-0.32)	-0.006 (-0.44)	-0.002 (-0.11)	-0.005 (-0.35)	-0.005 (-0.29)
No. of underwriters	-0.005 (-1.50)	-0.006 (-1.61)	-0.005 (-1.32)	-0.006 (-1.59)	-0.005 (-1.50)	-0.005 (-1.52)	-0.005 (-1.46)	-0.005 (-1.44)	-0.004 (-1.17)	-0.007* (-1.67)	-0.006 (-1.63)	-0.005 (-1.28)
Emerging dummy	-0.060 (-0.99)	-0.045 (-0.78)	-0.042 (-0.74)	-0.031 (-0.51)	-0.106 (-1.50)	-0.017 (-0.28)	-0.008 (-0.13)	-0.079 (-1.33)	-0.118 (-1.56)	-0.140* (-1.68)	-0.041 (-0.72)	-0.140 (-1.54)
Constant	0.112 (0.19)	0.003 (0.00)	0.086 (0.16)	-0.103 (-0.18)	0.461 (0.72)	-0.124 (-0.22)	-0.221 (-0.38)	0.330 (0.57)	0.700 (1.04)	-0.311 (-0.456)	0.016 (0.03)	-0.317 (-0.46)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.113	0.112	0.134	0.113	0.118	0.116	0.120	0.123	0.131	0.129	0.114	0.151
Observations	287	287	287	287	287	287	287	287	287	219	287	219

Notes: Results of ordinary least squares (OLS) regressions on the effect of law enforcement on IPO underpricing. The sample is 364 foreign IPOs in the US market from 1991 to 2008.

In Column 3 through Column 9, we look at public enforcement and the five components: supervisor characteristics index, rule-making power index, investigative powers index, orders index and criminal sanction index. In Column 3, the coefficient on the public enforcement index is  $-0.402$  and is statistically significant at the 1% level. This suggests that public enforcement would reduce IPO underpricing significantly and is consistent with the hypothesis that there is a negative relationship between the home country's law enforcement and foreign IPO underpricing. To better understand the effects of public enforcement on IPO underpricing, we further examine the five elements of the public enforcement index. Among these five components, the criminal sanction index, which covers criminal sanctions against violations of securities laws, is the only one that is statistically significant (Columns 8 and 9). Therefore, we conclude that the home-country's criminal sanctions against directors, distributors, or accountants can effectively reduce ex-ante uncertainty, thus reducing information asymmetry and IPO underpricing. For the other four components, though negatively related with IPO underpricing, the coefficients are insignificant (Columns 4 through 7).

In Column 10, we use corruption to proxy the law enforcement efficiency, assuming that corruption might undermine the deterrence of crime. We adopt the Corruption Perception Index (CPI) introduced by Transparency International. CPI ranks a country on a scale of 0 to 10, with a higher score indicating lower levels of corruption. The coefficient on the CPI is  $-0.06$  and is statistically significant at the 5% level. It indicates that nations with lower corruption levels are more efficient in enforcing the law; thus, issuers from such nations tend to achieve significantly lower IPO underpricing.

In Column 11, we report the regression result after adopting the insider-trading law enforcement dummy. The result shows that enforcement of insider-trading laws reduces IPO underpricing; however, the relationship is not statistically significant.

Finally, in Column 12 we regress IPO underpricing on all law enforcement variables – disclosure requirements, liability standards, public enforcement index, corruption (CPI) and insider-trading law enforcement, along with a group of control variables. The coefficients of the public enforcement index and CPI are significantly negative, which confirms better public law enforcement or less corruption would help reduce IPO underpricing.

The above analyses have produced results supporting our first hypothesis that issuers from countries with more efficient law enforcement levels (with these proxied by public enforcement and corruption levels) tend to have lower IPO underpricing. The results suggest that there will be less information asymmetry (less underpricing) for IPOs coming from a country with better public law enforcement. In such an environment, where law enforcement against private benefit of insiders is effectively in place, insiders are less likely to expropriate minority shareholders.

## *5.2 IPO underpricing and investor protection analysis*

Our second hypothesis conjectures that IPO underpricing tends to be lower if the issuer's home country has better investor legal protection. We adopt four variables to proxy the quality of investor protection: the anti-director rights index, the anti-self-dealing index, the creditor rights index and the insider-trading law existence dummy. The first two variables measure how strongly the legal system favors minority shareholders against managers or dominant shareholders. The creditor rights index proxies the level of creditor

protection. Table 6 presents results of IPO underpricing on various measures of investor protection quality.

Empirical results do not reveal any significant relationship between the level of IPO underpricing and the legal protection of investors. We interpret the results that investors prefer to see if the home country's legal framework does indeed take legal actions against expropriations of shareholders because the existence of legal protection rules does not necessarily guarantee justice actions.

**Table 6** The effects of investor legal protection on IPO underpricing

	1	2	3	4	5	6	7	8
Anti-director rights (antidir)	0.006 (0.40)							0.022 (0.85)
Creditor rights (cr)		-0.010 (-0.54)						0.001 (0.06)
Anti-self-dealing (antisd)			0.088 (0.88)					-0.085 (-0.53)
Exante_antisd				0.092 (1.30)		0.103 (1.38)		
Expost_antisd					-0.002 (-0.02)	-0.049 (-0.47)		
IT law existence (it_ex)							-0.033 (-0.12)	-0.045 (-0.18)
Log(size)	0.041 (1.44)	0.044 (1.46)	0.051 (1.57)	0.049 (1.55)	0.046 (1.41)	0.047 (1.43)	0.043 (1.43)	0.044 (1.39)
NQ dummy	0.075 (1.35)	0.075 (1.35)	0.074 (1.28)	0.076 (1.32)	0.074 (1.29)	0.078 (1.34)	0.068 (1.24)	0.091 (1.50)
High-tech dummy	0.034 (0.72)	0.055 (1.14)	0.052 (1.02)	0.055 (1.07)	0.056 (1.08)	0.058 (1.12)	0.053 (1.11)	0.036 (0.68)
Underwriter rank	-0.002 (-0.17)	0.000 (-0.02)	-0.001 (-0.04)	-0.001 (-0.08)	-0.001 (-0.08)	-0.002 (-0.12)	0.000 (0.01)	-0.004 (-0.27)
No. of underwriters	-0.006* (1.68)	-0.005 (-1.41)	-0.006 (-1.42)	-0.005 (-1.37)	-0.005 (-1.38)	-0.005 (-1.30)	-0.005 (-1.36)	-0.006 (-1.57)
Emerging dummy	-0.030 (-0.65)	-0.015 (-0.32)	-0.017 (-0.34)	-0.028 (-0.56)	-0.018 (-0.34)	-0.036 (-0.68)	-0.011 (-0.23)	-0.032 (-0.64)
Constant	-0.173 (-0.62)	-0.184 (-0.89)	-0.285 (-1.18)	-0.284 (-1.22)	-0.204 (-0.84)	-0.248 (-1.01)	-0.172 (-0.49)	-0.123 (-0.27)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.120	0.091	0.091	0.094	0.089	0.092	0.095	0.105
Observations	287	360	339	339	339	339	363	263

Notes: Results of ordinary least squares (OLS) regressions on the effect of investor legal protection on IPO underpricing. The sample is 364 foreign IPOs in the US market from 1991 to 2008.

**Table 7** The effects of home-country legal origin on IPO underpricing

	1	2	3	4	5	6	7	8
Common law origin (UK)	-0.047 (-0.96)							
French civil law origin (FR)		-0.021 (-0.42)			0.016 (0.30)			
German civil law origin (GE)			0.105* (1.76)		0.113* (1.72)			
Scandinavian civil law origin (SC)				-0.040 (-0.22)	-0.029 (-0.16)			
Legal origin (common law and Scandinavian civil law)						-0.051 (-1.03)		
Legal origin (common law and German civil law)							0.023 (0.47)	
Legal origin (Scandinavian and German civil law)								0.092 (1.61)
Log(IPO size)	0.038 (1.26)	0.045 (1.48)	0.039 (1.32)	0.043 (1.45)	0.038 (1.26)	0.038 (1.25)	0.045 (1.49)	0.039 (1.32)
NASDAQ dummy	0.071 (1.31)	0.067 (1.23)	0.073 (1.35)	0.068 (1.25)	0.074 (1.36)	0.072 (1.32)	0.067 (1.23)	0.072 (1.32)
High-tech dummy	0.056 (1.16)	0.049 (0.99)	0.040 (0.83)	0.054 (1.12)	0.043 (0.87)	0.057 (1.19)	0.049 (1.00)	0.040 (0.82)
Underwriter rank	-0.002 (-0.14)	0.000 (0.03)	-0.005 (-0.11)	0.000 (-0.00)	-0.002 (-0.14)	-0.002 (-0.15)	0.000 (0.04)	-0.001 (-0.10)
No. of underwriters	-0.005 (-1.25)	-0.005 (-1.39)	-0.005 (-1.26)	-0.005 (-1.38)	-0.005 (-1.22)	-0.005 (-1.25)	-0.005 (-1.40)	-0.005 (-1.25)
Emerging market dummy	-0.023 (-0.47)	-0.008 (-0.17)	-0.031 (-0.65)	-0.011 (-0.23)	-0.035 (-0.71)	-0.025 (-0.52)	-0.008 (-0.18)	-0.027 (-0.56)
Constant	-0.154 (-0.74)	-0.211 (-1.04)	-0.230 (-1.14)	-0.206 (-1.02)	-0.227 (-1.12)	-0.151 (-0.72)	-0.235 (-1.11)	-0.224 (-1.11)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.098	0.096	0.103	0.0953	0.098	0.098	0.0957	0.102
Observations	363	363	363	363	363	363	363	363

Notes: Results of ordinary least squares (OLS) regressions on the effect of home-country legal origin on IPO underpricing. The sample is 364 foreign IPOs in the US market from 1991 to 2008.

### 5.3 *IPO underpricing and legal origin analysis*

Our last hypothesis proposes that IPO underpricing tends to be lower if the issuer's home country has better investor legal system. The legal origin can proxy the quality of a legal system. La Porta et al. (1998) report that common law countries generally have better legal systems than civil law countries.

Table 7 presents the results of IPO underpricing on legal origin. German legal origin is weakly positively related to IPO underpricing (Columns 3 and 5). Issuers from German civil law countries tend to have larger underpricing compared with those from common law countries or other civil law nations. This is consistent with La Porta et al. (1998), which shows the German civil countries are not particularly protective of shareholders (with the lowest anti-director rights index value).

To further investigate the issue, we create three dummy variables with different grouping methodologies and run regressions separately. The first dummy variable indicates whether the country has better shareholder protection, = 1 for common law countries and Scandinavian civil law countries, 0 otherwise. The second dummy variable indicates whether the country has better creditor protection, = 1 for common law countries and German civil law countries, 0 otherwise. The last dummy variable indicates whether the country has more efficient law enforcement, = 1 for German and Scandinavian civil law countries, 0 otherwise. However, our results do not show statistically significant relationships between these different groups of origin-based legal frameworks and IPO underpricing. One possible explanation is that the legal origin variable covers a wider range of legal protection and law enforcement practices. The difference in legal protection or law enforcement among countries cannot be unambiguously represented by different legal origins. In other words, investors and underwriters may "place unequal weight on the various measures of investor protection and law enforcement" (Chen and Hao, 2011).

### 5.4 *Robustness check tests*

To further assess the robustness of our results, we perform two alternative tests of our first hypothesis.

First, we include the legal origin dummy into the regressions of the first hypothesis to examine whether the effects of law enforcement disappear after controlling legal origin. The results are in Table 8. The coefficient on the public enforcement index is  $-0.378$  and is statistically significant (Column 3). The coefficient on corruption (CPI) is  $-0.059$  and is similarly statistically significant (Column 10).

Second, we adopt different proxies introduced in La Porta et al. (1998) to examine the robustness of our results on law enforcement: the efficiency of the judicial system and the level of per capita income (logarithm of GDP per capita). We regress IPO underpricing on these legal enforcement variables, along with the control variable. We find similar results in Table 9 to indicate that there is a negative relationship between the home-country law enforcement and IPO underpricing.

Overall, these results are consistent with our main findings that issuers from highly corrupted countries or countries with weak public law enforcement tend to have larger IPO underpricing. Furthermore, our results provide evidence against the functional convergence hypothesis. Even when a non-US firm meets sophisticated US regulations and goes public in a US stock exchange, its IPO underpricing is still influenced by its respective home-country's legal and judicial institutions.

**Table 8** The effects of law enforcement on IPO underpricing

	1	2	3	4	5	6	7	8	9	10	11	12
Disclosure requirement index	-0.015 (-0.07)											0.187 (0.66)
Liability standard index		-0.256 (-0.43)										0.179 (1.23)
Public enforcement index			-0.378** (-2.47)									-0.492** (-2.20)
1 Supervisor char. Index				-0.068 (-0.86)					-0.088 (-0.70)			
2 Rule-making power index			-0.118*		(-1.78)		-0.162**		(-2.03)			
3 Investigative power index				-0.086		(-1.00)	-0.053		(-0.39)			
4 (Stop and Do) Orders index					-0.099		-0.046 (-1.35)		(-0.46)			
5 Criminal sanction Index								-0.183 (-1.45)	(-1.08)			
Corruption (CPI)										-0.059** (-1.97)		-0.076** (-2.32)
Insider trading law Enforcement											-0.088 (-1.29)	-0.101 (-0.79)

**Table 8** The effects of law enforcement on IPO underpricing (continued)

	1	2	3	4	5	6	7	8	9	10	11	12
Anti-director rights index	0.031 (1.24)	0.032 (1.31)	0.059** (2.22)	0.034 (1.40)	0.037 (1.55)	0.042 (1.57)	0.044* (1.69)	0.026 (1.10)	0.056** (2.04)	0.061* (1.75)	0.037 (1.50)	0.100** (2.47)
Ln(GDP per capita)	-0.002 (-0.03)	-0.001 (-0.01)	-0.001 (-0.02)	0.020 (0.34)	-0.045 (-0.77)	0.009 (0.16)	0.013 (0.25)	0.013 (0.25)	-0.032 (-0.56)	0.026 (0.41)	0.008 (0.15)	0.057 (0.86)
Judiciary efficiency	0.011 (0.45)	0.013 (0.53)	0.010 (0.45)	0.007 (0.31)	0.013 (0.55)	0.012 (0.52)	0.013 (0.58)	0.013 (0.58)	0.009 (0.37)	0.056 (1.57)	0.018 (0.74)	0.072* (1.84)
Log(size)	0.035 (1.21)	0.035 (1.22)	0.026 (0.92)	0.033 (1.16)	0.035 (1.22)	0.034 (1.17)	0.029 (1.02)	0.032 (1.10)	0.027 (0.91)	0.056 (1.51)	0.035 (1.20)	0.043 (1.17)
NQ_dummy	0.076 (1.32)	0.077 (1.34)	0.059 (1.03)	0.072 (1.24)	0.074 (1.29)	0.075 (1.30)	0.070 (1.22)	0.065 (1.13)	0.053 (0.92)	0.106 (1.47)	0.080 (1.40)	0.075 (1.04)
High-tech_dummy	0.040 (0.81)	0.041 (0.83)	0.043 (0.87)	0.047 (0.94)	0.024 (0.49)	0.042 (0.86)	0.045 (0.91)	0.036 (0.73)	0.028 (0.56)	0.062 (0.98)	0.051 (1.02)	0.073 (1.15)
Underwriter rank	-0.004 (-0.33)	-0.005 (-0.36)	-0.006 (-0.49)	-0.005 (-0.37)	-0.004 (-0.34)	-0.005 (-0.38)	-0.005 (-0.40)	-0.004 (-0.35)	-0.006 (-0.48)	-0.003 (-0.19)	-0.007 (-0.51)	-0.007 (-0.43)
No. of underwriters	-0.005 (-1.40)	-0.005 (-1.42)	-0.004 (-1.20)	-0.005 (-1.40)	-0.004 (-1.25)	-0.005 (-1.37)	-0.005 (-1.34)	-0.005 (-1.38)	-0.004 (-1.10)	-0.006 (-1.47)	-0.005 (-1.43)	-0.005 (-1.16)
Emerging_dummy	-0.012 (-0.16)	-0.010 (-0.16)	-0.016 (-0.26)	0.009 (0.14)	-0.075 (-1.03)	0.011 (0.17)	0.014 (0.21)	-0.059 (-0.83)	-0.097 (-1.19)	-0.076 (-0.81)	0.003 (0.05)	-0.044 (-0.40)
Legal origin (common)	-0.106 (-1.15)	-0.105 (-1.32)	-0.078 (-0.98)	-0.114 (-1.43)	-0.138* (-1.71)	-0.097 (-1.22)	-0.082 (-1.01)	-0.046 (-0.51)	-0.082 (-0.75)	-0.158 (-1.45)	-0.129 (-1.60)	-0.225 (-1.58)
Constant	-0.237 (-0.36)	-0.256 (-0.43)	-0.110 (-0.19)	-0.400 (-0.65)	0.230 (0.35)	-0.346 (-0.58)	-0.390 (-0.65)	0.171 (0.26)	0.483 (0.66)	-0.688 (-0.95)	-0.303 (-0.51)	-0.897 (-1.14)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.114	0.114	0.134	0.116	0.125	0.117	0.120	0.121	0.130	0.134	0.119	0.158
Observations	287	287	287	287	287	287	287	287	287	219	287	219



**Table 9** The effects of law enforcement on IPO underpricing

	1	2	3	4
Corruption (CPI)	-0.036* (-1.87)			-0.053* (-1.84)
Judiciary efficiency		-0.007 (-0.38)		0.034 (1.06)
Ln(GDP per capita)			-0.058* (-1.66)	-0.005 (-0.08)
Log(size)	0.057 (1.53)	0.039 (1.37)	0.041 (1.39)	0.058 (1.59)
NASDAQ dummy	0.110 (1.63)	0.080 (1.41)	0.081 (1.48)	0.118 (1.63)
High-tech dummy	0.074 (1.26)	0.038 (0.78)	0.048 (1.01)	0.057 (0.91)
Underwriter rank	0.000 (-0.03)	-0.003 (-0.24)	-0.002 (-0.16)	-0.003 (-0.17)
No. of underwriters	-0.006 (-1.26)	-0.006* (-1.66)	-0.004 (-1.17)	-0.007* (-1.66)
Emerging market dummy	-0.135 (-1.56)	-0.045 (-0.94)	-0.070 (-1.19)	-0.156* (-1.92)
Constant	-0.015 (-0.06)	-0.070 (-0.22)	0.333 (0.87)	-0.080 (-0.13)
Year dummies	Yes	Yes	Yes	Yes
Adj. R2	0.105	0.120	0.103	0.129
Observations	291	287	363	219

Notes: Results of ordinary least squares (OLS) regressions on the effect of law enforcement on IPO underpricing. The independent variables measuring law enforcement are from La Porta et al. (1998): corruption; judiciary efficiency; and logarithm of GDP per capita. The sample is 364 foreign IPOs in the US market from 1991 to 2008.

## 6 Conclusions

As capital markets have developed internationally, the location of trade has become an increasingly important choice for firms. It is well-recognised that legal protections of shareholder interests can affect valuations and the ability to raise capital externally, for example, La Porta et. al (1997, 1998, 1999) and Grinblatt and Titman (1998). Coffee (1999) and Stulz (1999) have suggested that the ability to cross-list allows a firm to influence the legal regime under which one operates. This explanation for cross-listing complements the market segmentation explanations that have been discussed in the literature (see Miller 1999). We provide additional evidence to law and finance literature

by examining how legal systems affect IPO underpricing by looking at a sample of 364 non-US firms' IPOs in the US over the period of 1991–2008.

Our results suggest that foreign firms initially listed in US markets are influenced by the quality of their respective home country law enforcement. First, firms from a highly corrupted country are associated with more IPO underpricing. Corruption undermines effective deterrence of crime and, therefore, increases the 'ex ante uncertainty' of IPO valuation. Second, IPO underpricing is lower if the home country's public law enforcement is more efficient. Among the five components of the public enforcement index, the criminal sanction contributes significantly to reduce IPO underpricing.

In contrast to the strong relationship between foreign IPO underpricing and the home-country public law enforcement, we find no evidence that IPO underpricing is associated with home-country investor protection. We interpret the results as evidence that investors prefer to see if the home country's legal framework does indeed take legal actions against expropriations of investors, while the existence of legal protection rules does not necessarily warrant justice action.

Third, where legal origins are concerned, we find that IPOs from German civil law countries tend to have more underpricing, while those from common law countries, the underpricing is lower, but the relationship is not significant. This may be because the legal origin variable covers a broad range of legal indicators and aspects and, thus, cannot effectively reflect the differences in legal protection or law enforcement across nations. Johnson et al. (2000) conjecture that common law is more suspicious of conflicted transactions than civil law and subjects them to closer regulatory and legal scrutiny. The results of this paper are broadly consistent with that conjecture. For example, common law countries subject related-party transactions to greater disclosure requirements as well as to more arm's-length approval than do civil law countries. These different approaches to the regulation of investor expropriation, appear to derive from long-standing legal principles, such as fiduciary duty, which over time are incorporated into the statutes that we actually observe.

Since we have shown, even though when non-US firms meet the sophisticated US IPO regulations and requirements their IPO underpricing is still influenced by the home-country's legal institutions, our analysis supports the arguments against the functional convergence hypothesis.

What should be the role of the law in addressing investor expropriation? One approach is to do nothing and to count on 'the invisible hand' – market forces to sort out the problem. Virtually no society uses this approach. At the other extreme, a society can prohibit conflicted transactions altogether: all dealings between a corporation and its controllers, or any other entity these controllers also control, could be banned by law. Yet no society finds it practical to use this approach either, perhaps because in many instances related-party transactions actually make economic sense.

So what do we do? If we take the evidence in this paper, the most crucial message for the improvement of regulation of corporate governance perhaps is that *laissez-faire* – the strategy of no public involvement at all – does not lead to more developed financial markets. The public sector clearly has a central role to play.

Future study may look at the constituents of each legal variable to shed further light on what legal parameters might be more significant in reducing the costs of external financing. Another area that warrants further investigation is whether the home-country legal institutions affect decisions related with IPO share type or the IPO listing market, or

if foreign issuers consider these two parameters simultaneously in order to maximise their benefits in IPO.

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### References

- Aggarwal, R., Bhagat, S. and Rangan, S. (2009) 'The impact of fundamentals on IPO valuation', *Financial Management*, Summer, Vol. 38, No. 2, pp.253–284.
- Baron, D. (1982) 'A model of the demand for investment banking advising and distribution services for new issues', *Journal of Finance*, Vol. 37, No. 4, pp.955–976.
- Beatty, R. and Ritter, J. (1986) 'Investment banking, reputation and the underpricing of initial public offerings', *Journal of Financial Economics*, Vol. 15, Nos. 1/2, pp.213–232.
- Bell, R.G., Curt, B.M. and Hussam A.A. (2008) 'Country of origin and foreign IPO legitimacy: understanding the role of geographic scope and insider ownership', *Entrepreneurship Theory and Practice*, Vol. 32, No. 1, pp.185–202.
- Benveniste, L.M. and Spindt, P.A. (1989) 'How investment bankers determine the offer price and allocation of new issues', *Journal of Financial Economics*, Vol. 24, No. 2, pp.343–361.
- Bhattacharya, U. and Daouk, H. (2002) 'The world price of insider trading', *Journal of Finance*, Vol. LVII, No. 1, pp.75–108.
- Blass, A. and Yafeh, Y. (2001) 'Vagabond shoes longing to stray: why foreign firms list in the United States', *Journal of Banking and Finance*, Vol. 25, No. 3, pp.555–572.
- Boulton, T., Smart, S. and Zutter, C. (2010) 'IPO underpricing and international corporate governance', *Journal of International Business Studies*, Vol. 41, No. 2, pp.206–222.
- Bruner, R., Chaplinsky, S. and Ramchand, L. (2004) 'US-Bound IPOs: issue costs and selective entry', *Financial Management*, Vol. 33, No. 3, pp.39–60.
- Bruner, R., Chaplinsky, S. and Ramchand, L. (2006) 'Coming to America: IPOs from emerging market issuers', *Emerging Markets Review*, Vol. 7, No. 3, pp.191–212.
- Carter, R. and Manaster, S. (1990) 'Initial public offerings and underwriter reputation', *Journal of Finance*, Vol. 45, No. 4, pp.1045–1067.
- Chen, H. and Hao, Q. (2011) 'Insider trading law enforcement and gross spreads of ADR IPOs', *Journal of Banking and Finance*, Vol. 35, No. 8, pp.1907–1917.
- Coffee, J.C. (1999) 'The future as history: the prospects for global convergence in corporate governance and its implications', *Northwestern University Law Review*, Vol. 93, No. 3, pp.641–708.
- Coffee, J.C. (2002) 'Racing towards the top?: the impact of cross-listings and stock market competition on international corporate governance', *Columbia Law Review*, Vol. 102, No. 7, pp.1757–1831.
- Djankov, S., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2008) 'The law and economics of self-dealing', *Journal of Financial Economics*, Vol. 88, No. 3, pp.430–465.

- Doidge, C. (2004) 'US cross-listings and the private benefits of control: evidence from dual-class firms', *Journal of Financial Economics*, Vol. 72, No. 3, pp.519–553.
- Doidge, C., Karolyi, G.A. and Stulz, R.M. (2004) 'Why are foreign firms listed in the US worth more?', *Journal of Financial Economics*, Vol. 71, pp.205–238.
- Ejara, D.D. and Ghosh, C. (2004) 'Underpricing and aftermarket performance of American depository receipts (ADR) IPOs', *Journal of Banking and Finance*, Vol. 28, No. 12, pp.3151–3186.
- Engelen, P. and Van Essen, M. (2010) 'Underpricing of IPOs: firm-, issue- and country-specific characteristics', *Journal of Banking and Finance*, Vol. 34, No. 8, pp.1958–1969.
- Fanto, J. (1996) 'The absence of cross-cultural communication: SEC mandatory disclosure and foreign corporate governance', *Journal of International Law and Business*, Vol. 17, No. 1, pp.119–207.
- Francis, B.B., Hasan I., Lothian, J.R. and Sun, X. (2010) 'The signaling hypothesis revisited: evidence from foreign IPOs', *Journal of Financial and Quantitative Analysis*, Vol. 45, No. 1, pp.81–106.
- Fuerst, O. (1998) *A Theoretical Analysis of the Investor Protection Regulations Argument for Global Listing of Stocks*, Unpublished working paper, Yale University.
- Grinblatt, M. and Titman, S. (1998) *Financial Markets and Corporate Strategy*, Irwin McGraw-Hill, Boston, MA.
- Jensen, M. and Meckling, W. (1976) 'Theory of the Firm: managerial behavior, agency costs and ownership structure', *Journal of Financial Economics*, Vol. 3, No. 4, pp.305–360.
- Johnson, S., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2000). 'Tunneling', *American Economic Review*, Vol. 90, No. 2, pp.22–27.
- La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2006) 'What works in securities laws?', *Journal of Finance*, Vol. LXI, No. 1, pp.1–32.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny R. W. (1997) 'Legal determinants of external finance', *Journal of Finance*, Vol. LII, No. 3, pp.1131–1150.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R.W. (1998) 'Law and finance', *Journal of Political Economy*, Vol. 106, No. 6, pp.1113–1155.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R.W. (1999) 'The quality of government', *Journal of Law, Economics and Organization*, Vol. 15, No. 1, pp.222–279.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R.W. (2000a) 'Investor protection and corporate governance', *Journal of Financial Economics*, Vol. 58, Nos. 1–2, pp.3–27.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R.W. (2000b) 'Agency problems and dividend policies around the world', *Journal of Finance*, Vol. 55, No. 1, pp.1–33.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R.W. (2002) 'Investor protection and corporate valuation', *Journal of Finance*, Vol. LVII, No. 3, pp.1147–1170.
- Leland, H. and Pyle, D. (1977) 'Information asymmetries, financial structure and financial intermediation', *Journal of Finance*, Vol. 32, No. 2, pp.371–387.
- Licht, A.N. (2000) 'Genie in a bottle? Assessing managerial opportunism in international securities transactions', *Columbia Business Law Review*, Vol. 2000, No. 1, pp.51–120.
- Licht, A.N. (2003) 'Cross-listing and corporate governance: bonding or avoiding?', *Chicago Journal of International Law*, Vol. 4, No. 1, pp.141–163.
- Merton, R. (1987). 'A simple model of capital market equilibrium with incomplete information', *Journal of Finance*, Vol. 42, No. 3, pp.483–510.
- Miller, D. (1999) 'The market reaction to international cross listing: evidence from depository receipts', *Journal of Financial Economics*, Vol. 51, No. 1, pp.103–123.
- Mitton, T. (2002) 'A cross-firm analysis of the impact of corporate governance on the East Asian financial crisis', *Journal of Financial Economics*, Vol. 64, No. 2, pp.215–241.

- Peng, M. and Jiang, Y. (2010) 'Institutions behind family ownership and control in large firms', *Journal of Management Studies*, Vol. 47, No. 2, pp.253–273.
- Reese Jr., W.A. and Weisbach, M.S. (2002) 'Protection of minority shareholder interests, cross-listings in the United States and subsequent equity offerings', *Journal of Financial Economics*, Vol. 66, No. 1, pp.65–104.
- Ritter, J. (1987) 'The costs of going public', *Journal of Financial Economics*, Vol. 19, No. 2, pp.269–281.
- Ritter, J. (1998) 'Initial public offerings', *Contemporary Finance Digest*, Vol. 2, No. 1, pp.3–30.
- Rock, K. (1986) 'Why new issues are underpriced', *Journal of Financial Economics*, Vol. 15, Nos. 1–2, pp.187–212.
- Shleifer, A. and Wolfenzon, D. (2002) 'Investor protection and equity markets', *Journal of Financial Economics*, Vol. 66, No. 1, pp.3–27.
- Siegel, J. (2005) 'Can foreign firms bond themselves effectively by renting US securities laws?', *Journal of Financial Economics*, Vol. 75, No. 2, pp.319–359.
- Stulz, R. (1999) 'Globalization, corporate finance and the cost of capital', *Journal of Applied Corporate Finance*, Vol. 12, No. 3, pp.8–25.