# A MANAGERIAL MOTIVE FOR INITIAL PUBLIC OFFERING UNDERPRICING

by

Thomas J. Boulton

Bachelor of Science, The Ohio State University, 1993

Master of Business Administration, Cleveland State University, 2002

Submitted to the Graduate Faculty of

the Joseph M. Katz Graduate School of Business

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

University of Pittsburgh

2006

UNIVERSITY OF PITTSBURGH

Joseph M. Katz Graduate School of Business

This dissertation was presented

by

Thomas J. Boulton

It was defended on

August 14th, 2006

and approved by

Kenneth Lehn, Phd.
Samuel A. McCullough Professor of Finance
Katz Graduate School, University of Pittsburgh

Robert Jennings, Phd.
Gregg T. and Judith A. Summerville Professor of Finance
Kelley School of Business, Indiana University

Shawn Thomas, Phd.
Associate Professor of Finance
Katz Graduate School, University of Pittsburgh

Chad Zutter, Phd.
Assistant Professor of Finance
Katz Graduate School, University of Pittsburgh

Scott Smart, Phd.
Eli Lilly and Company Faculty Fellow
Kelley School of Business, Indiana University

**Acknowledgements**

This dissertation is dedicated to my wife Kerry and my sons Max and William who have sacrificed so much to allow me pursue my education. I love you for so many reasons, not the least of which is your unconditional love and support.

I love and thank my parents for the examples and opportunties they have set for me throughout my life, including the importance of education and hard work. The incredible foundation you provided has allowed me to succeed in this journey.

I owe a debt of gratitute to my dissertation committee members, Professors Lehn, Thomas, Zutter, Jennings and Smart who have been generous with their time and expertise throughout this process. This dissertation and all that comes from it are greatly improved due to their insightful comments and suggestions.

I'd especially like to thank Professor Zutter, who has provided a wealth of guidance and opportunity to me during my time at the University of Pittsburgh. Your door was always open to me and I thank you for all the attention, advice, and encouragement you offered the past three years.

Finally, I'd like to thank the doctoral office, especially Professors Prescott and Birnberg and Carrie Woods for all the help and understanding during my stay at Katz.

**A MANAGERIAL MOTIVE FOR INITIAL PUBLIC OFFERING UNDERPRICING**

Thomas J. Boulton

University of Pittsburgh, 2006

## Abstract

There are many reasons why managers are interested in maintaining control over their firm. Some potential reasons include compensation, autonomy, power, perquisites, and the ability to determine the terms under which the firm is acquired. This study examines one event that provides an opportunity for managers to take actions designed to maintain control of firm, the initial public offering (IPO). A simple rationing approach provides the mechanism which impacts management's ability to maintain control. The hypothesis underlying this study is that managers strategically underprice the IPO to influence outside blockholdings. By preventing large outside blocks from forming as part of the IPO, management reduces the incentive for outsiders to monitor their actions, resulting in greater autonomy.

Chapter One documents that IPO underpricing is significantly related to country-level governance characteristics. Examining a sample of 4.698 IPOs across 24 countries for the 2000-2004 time period, the results suggest that IPO underpricing is higher in countries which offer greater protection to investors. These findings are consistent with the hypothesis that IPO underpricing is an instrument used by managers to maintain control of the firm when country-level governance mechanisms favor investors' rights

Chapter Two finds that IPO underpricing exhibits a significant, positive relation with activity in the market for corporate control. Examining a sample of over 2,300 initial public offerings in the United States over the 1990-1998 time period, the results suggest that underpricing is greater when the market for corporate control is active. Additional results indicate that the corporate control climate prevailing at the time of the offering is related to the likelihood that a firm survives in subsequent years, that underpricing is associated with the post-offering ownership structure, and that the size of the external blockholdings formed concurrent with the offering are positively related to the probability a firm is taken over in the years following the event. Together, the findings presented in this study are consistent with the hypothesis that underpricing is an instrument used to protect managers when other governance mechanisms, including investors' rights and the market for corporate control, threaten their control over the firm.

**Table of Contents**

**List of Tables and Figures**

## Chapter One – International IPO Underpricing and Investor Protection

### 1. Introduction

Few areas of finance have captivated the attention of researchers, practitioners, the media, and the public as much as initial public offerings (IPOs), in particular the frequently large, first day gains to new issues. Many studies over the past few decades document IPO underpricing in individual countries, concluding as a whole that IPOs are on average underpriced in all time periods and in all countries with organized stock exchanges. More recent studies examining the link between IPO underpricing and issuing firm governance characteristics look at the determinants of this phenomenon. The existing research examining IPO underpricing as a function of governance characteristics generally takes a narrow approach by examining underpricing and its determinants in a single country, most often focusing on new issues in the United States. Studies incorporating a cross-sectional examination of IPO underpricing across a significant sample of countries appear to be non-existent. At a minimum, this study aims to correct this oversight in the academic literature.

The globalization of financial markets is another burgeoning area of interest to finance researchers and practitioners alike. The liberalization which has taken root in many of the worlds' economies has invigorated an era in which many firms are global firms with the ability to raise capital in dozens of markets around the world. This trend towards market integration has spawned a large body of research, often referred to as the law and finance literature, examining country-level governance characteristics and their effects on capital markets. A common theme in this strand of literature is the relation between investor protection and the breadth and depth of a country's capital markets (LaPorta, Lopez-de-Silanes, Shleifer, and Vishny, 1997).

A neglected consideration is the relation between IPO underpricing and country-level governance. In particular, there is no research relating the initial returns on public offerings to management's desire to maintain control of the firm and the country-level protections provided to investors. This study addresses this issue by testing whether a relation exists between the initial returns on IPOs and the degree of investor protection across a large sample of countries and IPO events.

Examining 4,698 IPO events representing 24 countries for the period 2000-2004, I first document that IPOs are underpriced, on average, in every country in the sample, with a mean initial return of 30.51 percent. The analysis continues by examining the relation between underpricing and country-level governance characteristics, including the protection of shareholders, creditor rights, corporate control activity, CEO turnover, and property rights. The results suggest that IPOs are underpriced more on average when investors are offered greater degrees of protection through such mechanisms.

The empirical results of this paper are consistent with a number of earlier studies that consider the relation between initial public offerings and the ownership structure of the firm, including Zingales (1995), Brennan and Franks (1997) and Mello and Parsons (1998). For example, Brennan and Franks posit that IPO underpricing is used strategically by issuers to influence the dispersion of share ownership in the aftermarket. This greater dispersion of share ownership results in the presence of fewer influential blockholders, resulting in a stronger controlling position for management. If investors are offered greater protections through the rules and norms of society, managers must pursue other avenues to strengthen their control of the firm. My hypothesis is that underpricing is one such substitute mechanism used by management to maintain control,

resulting in greater underpricing in countries which offer better protections to investors. Alternatively, substitute mechanisms to strengthen managerial control, including IPO underpricing, are less important in countries which offer weaker protections to investors.

The remainder of this paper is structured as follows. Section 2 highlights previous research on the benefits of control, IPO underpricing, and country-level governance related to this study. Section 3 describes my sample construction process and the methodology utilized in my sample analysis. Section 4 presents evidence of a strong relation between IPO underpricing and country-level governance characteristics, while Section 5 summarizes and concludes.

## 2. Previous research

### *A. Managerial control*

The benefits that a controlling position imparts on the manager-entrepreneur have a number of implications. A large body of literature, centered on the pioneering work of Jensen and Meckling (1976), examines the mechanisms designed to align the interests of management and shareholders. Such mechanisms include firm-specific characteristics such as the board of directors, the design of managerial compensation plans, and the structure and size of managerial and block ownership positions as well as external influences such as the managerial labor market and the market for corporate control. Each of these governance mechanisms plays a role in providing incentives for management to make decisions not only with their own interests in mind, but also the interests of other stakeholders in the firm, particularly shareholders. For example, large external blockholders are expected to provide greater levels of managerial oversight because the significant size of their ownership position gives them added incentive to see that their best interests are pursued by management.

A primary area of study related to control explores the actions which managers take in an effort to maintain and strengthen their hold on the firm. Such actions include, but are not limited to, holding controlling ownership stakes (Demsetz and Lehn, 1985), the implementation of dual class structures (Nenova, 2003), the configuration of the board of directors (Baker and Gompers, 2004), and diversification of the firm's operations (Shleifer and Vishny, 1989). A recurrent theme in the literature on control for the purposes of this study is that control has inherent value. Because control has value, managers have incentive to take actions which allow them to maintain, or even strengthen, their control over the firm. The devices available depend on the environment in which the firm operates and management's behavior is influenced by the mechanisms at their disposal which facilitate their goal to control the firm.

A number of theoretical works consider issues of control while focusing on the firm's initial public offering and subsequent ownership structure. Zingales (1995) hypothesizes that the IPO represents the first step in the transfer of control of the firm from the entrepreneur to a new owner. In Zingales' model, the entrepreneur uses the IPO to assemble the ownership structure that allows him to maximize his proceeds in an eventual control transaction. Zingales' model suggests that the value of cash flow rights are maximized by selling to dispersed shareholders, for which the IPO is ideally suited. On the other hand, the value of the entrepreneur's control position is maximized by bargaining directly with potential suitors, which is expected to occur subsequent to the IPO.

Like Zingales, Mello and Parsons (1998) hypothesize that it is optimal to sell shares to small, dispersed investors at the time of the IPO with the transfer of control

occurring at a later date. By selling to small investors through the IPO, the seller gathers information that helps him maximize his proceeds in a subsequent control transaction. For example, the sale of shares to small investors in the IPO and subsequent trading in the secondary market establish a market price for the firm which may aid the entrepreneur in gauging demand and negotiating the sale of the control block. Alternatively, Stoughton and Zechner (1998) posit that the optimal strategy is to establish large blockholders as part of the IPO. In their model, the formation of sizeable blockholders increases the value of the firm through increased monitoring of management, allowing for the sale of subsequent shares at a higher price.

Bebchuk (1999) introduces the size of the private benefits of control into the discussion of ownership structure and the IPO. Bebchuk hypothesizes that as the benefits of control become larger, it is optimal for the entrepreneur to maintain control of the firm to discourage outsiders from making the firm a target. Additionally, like Zingales and Mello and Parsons, Bebchuk posits that maintaining control at the time of the IPO allows the initial owner to maximize his proceeds in a subsequent control transfer. Finally, Bebchuk suggests two primary motivations for the use of antitakeover devices, to prevent unwanted acquisition attempts and to increase the entrepreneur's proceeds in a successful transfer of control.

*B. IPO underpricing*

A significant amount of empirical research, dating back at least to Ibbotson's (1975) study documents short-run underpricing of initial public offerings in the United States. Similar studies present consistent evidence of short-run underpricing of initial public offerings in many international markets (Loughran, Ritter and Rydqvist, 1994). In

sum, the underpricing of IPOs across time and in all countries examined is well documented. Additionally, it has been casually observed that there is significant variation in the degree of underpricing across countries.

Theories of IPO underpricing began to appear shortly after the introduction of the literature documenting the large initial returns to new issues. Characteristics of the issuing firm, the issue and the general market climate have all been cited as possible determinants of IPO underpricing. Benveniste and Spindt (1989) hypothesize that underpricing is used to acquire information from potential purchasers of the issue. As such, IPO underpricing is a cost of acquiring information during the bookbuilding process. Carter and Manaster (1990) conjecture that firms use prestigious underwriters to signal low risk in an effort to combat the effects of information asymmetry. Consistent with their hypothesis, they find that firms using more reputable underwriters exhibit lower initial returns on average. Additional theories of IPO underpricing include the "winner's curse" hypothesis of Rock (1986), information cascades (Welch, 1992), legal liability avoidance (Tinic, 1988), an absence of motivation to avoid underpricing (Habib and Ljungqvist, 2001) and "analyst lust" (Loughran and Ritter, 2002).

Brennan and Franks (1997) hypothesize that one motivation for underpricing is management's desire to control the firm. Utilizing a sample of U.K. IPOs, the authors present empirical evidence consistent with their hypothesis that underpricing is used to strategically influence a dispersed outside ownership structure, reducing the likelihood that ownership blocks are formed at the time of the issue. By reducing the probability that ownership blocks are formed at the time of the offering, the likelihood of management maintaining effective control of the firm is increased, allowing them to

continue to enjoy the private benefits that accompany the position of control. While it is possible that ownership blocks are formed following the issue, the initial dispersed ownership structure makes it more costly to form these blocks.

In a unique test of the Brennan and Franks "reduced monitoring hypothesis," Smart and Zutter (2003) compare single- and dual-class issuers in the United States and find lower levels of underpricing for dual-class offerings. Their empirical results are consistent with the reduced monitoring hypothesis as managers of dual-class firms have a substitute mechanism at their disposal for maintaining control of the firm, namely the class of stock imparting superior voting rights. The presence of this substitute mechanism reduces the need to underprice shares since a dispersed outside ownership structure is less important when superior voting rights stock provides the control that management desires. In effect, the dual-class structure guarantees managerial control, reducing the need for substitute mechanisms such as IPO underpricing.

Field and Karpoff (2002) provide additional evidence consistent with the reduced monitoring hypothesis. In particular, the authors document that takeover defenses are employed by a significant number of firms at the time of the initial public offering and that these mechanisms are effective in allowing management to maintain control of the firm. Contrary to studies supporting the reduced monitoring hypothesis, Arugaslan, Cook and Kieschnick (2004) conclude that monitoring is not a primary motivation for offer underpricing. They argue that earlier tests fail to consider important determinants of underpricing and institutional ownership, most importantly firm size, which led to results supportive of the reduced monitoring hypothesis.

*C. Country corporate governance*

Like initial public offerings, international corporate governance is a burgeoning area of research in finance. LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998, 1999, 2000, 2002, and 2006) authored a series of articles over the past decade examining the association between country-level governance characteristics, including investor protections, accounting standards, creditor rights, and property rights, and the development of capital markets. LaPorta et al. provide evidence that country characteristics such as legal origin have a strong influence on a country's governance, which in turn has a profound impact on the development of the country's capital markets. International governance studies like those of LaPorta et al. provide the basis for country-level governance metrics utilized in this study.

Bhattacharya and Daouk (2002) examine the association between country-level governance and financial market development. Their research finds that the mere presence of insider trading laws is not reflected in the cost of equity in a country. Instead, the initial enforcement of insider trading laws is the event that triggers a decrease in the cost of equity. In an extension of their earlier study, Bhattacharya and Daouk (2005) hypothesize that it can be the case that the absence of law is better than an unenforced law. Finally, Bhattacharya, Daouk, and Welker (2003) find that trading in a country's stock markets declines when earnings opacity increases. Together, the work of LaPorta et al. and Bhattacharya et al. illustrate the importance of investor protection to the development and continued effectiveness of a country's capital markets.

The hypothesis presented here assumes that control is valuable to a certain degree in all countries. Because control is valuable, managers are motivated to take actions to ensure they maintain control. Countries offering weaker protections to investors allow

management to maintain their position of control to a greater degree simply based on the laws of the nation. For example, countries with infrequent corporate control events insulate management from losing control in a takeover transaction. Alternatively, control is more tenuous in countries with strong investor protections. As such, managers are forced to seek alternative ways to maintain control in such countries. The hypothesis presented here is that IPO underpricing is one such alternative mechanism, resulting in greater underpricing in countries with better investor protection, where substitute vehicles for maintaining control are more likely to be employed.

## 3. Sample selection and descriptive statistics

### *A. Sample selection*

The starting point for construction of the sample of countries consists of the 49 nations which provide the foundation for the international governance studies of LaPorta et al. The list of countries is narrowed further by including only those examined by LaPorta et al. which are also included in Dyck and Zingales (2004) study of the private benefits of control. The intersection of the 49 countries contained in the LaPorta et al. studies with the 39 countries addressed by Dyck and Zingales results an initial sample of 37 countries.

IPO events are identified using *Thomson Financial's SDC Platinum* database. All IPOs for the period 2000-2004 are pulled from the various country and regional *New Issues* databases. IPO events are restricted to new listings in one of the 37 countries identified as detailed above. Price and volume information for the new issues is retrieved from *Datastream*, which requires manually matching the IPO issuer to its unique *Datastream* identifier, resulting in a final sample of 4,698 IPO events.

Restrictions on minimum offer prices are common in the IPO literature. For example, Ritter (1991) restricts his sample to U.S. IPOs with a minimum offer price of $1.00. The impact of the bid-ask bounce is the primary justification for a minimum offer price. Imposing such a filter has an enormous impact on the current sample, eliminating a number of countries entirely from the analysis, while greatly reducing the number of IPOs in many of the countries which remain. Applying even a $1 minimum offer price eliminates almost one-third of the sample events. As such, the analysis as reported does not impose a minimum offer price requirement.[1] Precedent for the absence of a minimum offer price is found in Ljungqvist (2005), who does not mention such a restriction when documenting IPO underpricing in various international markets.

*B. Descriptive statistics*

Figures 1 through 5 and Tables 1 and 2 present descriptive statistics for the sample of initial public offerings. Figure 1 illustrates mean underpricing by country of listing, while the expanded data underlying this figure is present in Table 1. Coffee (1999, 2002) suggests that firms cross-list in order to bond themselves to the standards of the listing market. In particular, firms cross-listing in the U.S. are subject to the powers of the SEC, required to meet generally accepted accounting principles, and face the scrutiny of the financial intermediaries involved in the security markets. While most sample IPOs originate and list in the same country, a number of companies choose to list outside their country of origin. The vast majority of these cross-listing firms list in the United States. Since cross-listing is thought to serve as a way to bond management to the standards of the listing country, the country in which the firm lists is the important

[1] Robustness tests were performed using the following minimum offer price restrictions: $1, $3, $5 and $10. The main conclusions of the analysis are the same when these minimums were applied.

location for this study.[2] Figure 1 demonstrates the prevalence of IPO underpricing, which occurs in all of the sample countries. The average sample IPO is underpriced by 30.51%. IPOs are on average underpriced the most in South Korea (70.23%) and the least in Taiwan (1.9%).

Figures 2 and 3 displays the total number of IPOs (Figure 2) and the average IPO underpricing by issue year (Figure 3). Figure 2 clearly illustrates the slow down in equity offerings following the downturn in many of the world's equity markets in 2000. The current sample contains 1,439 IPOs in 2000, which declines by over 50 percent to 709 in 2003, then increases to 1,206 issues in 2004. Consistent with the "hot issues market" phenomenon identified in the literature (Ritter, 1984), average underpricing is highly correlated with the number of IPOs in a given year with a correlation coefficient of 0.689. To account for the hot issues phenomenon, I control for issue year and recent market returns in my regression analysis.

Figure 4 reflects the composition of the IPO sample based on the industry of the issuing firm. The broad industry classifications of *Securities Data Corporation (SDC)* as identified in Dyck and Zingales (2004) form the basis for the industry distribution. Additionally, hi-tech firms are separated from their SDC industry using the hi-tech SIC codes identified in Ljungqvist and Wilhelm (2003). The industry decomposition in Figure 4 shows that the sample is dominated by the usual suspects. To account for the industry composition of my sample, industry dummy variables are employed in the regression analysis. The partitioning of hi-tech firms into a unique category is motivated by the IPO literature finding greater levels of underpricing for hi-tech firms in the late 1990s and early 2000s, including the study of Ljungqvist and Wilhelm (2003).

[2] Robustness tests indicate that the results are quantitatively unchanged by focusing on country of origin.

Consistent with the results of Ljungqvist and Wilhelm and others, Figure 5 demonstrates greater average underpricing for firms in hi-tech industries compared to other industries in the sample. In fact, hi-tech firms experience an initial price increase of nearly 40 percent on average, while the average for all IPOs outside of the hi-tech industry classification is approximately 27 percent. Outside of the hi-tech industry, average IPO underpricing ranges from 16.65 percent for mining firms to 31.68 percent for firms in a service industry.

## 4. Empirical results

### *A. Proxies for control*

The law and finance literature examines the association between country characteristics such as the protections afforded to investors, accounting standards, and enforcement of property rights, and the development of a country's capital markets. A number of earlier studies, including LaPorta et al., Bhattacharya et al., Jaggers and Marshall (2000), and Kaufmann, Kraay and Mastruzzi (2003), present summary measures of country-level governance characteristics from which the current study benefits. Table 2 contains a list and descriptions of the measures utilized in the empirical analysis. The governance measures examine characteristics such as accounting standards, protection of investors (shareholders and creditors), CEO turnover frequency, level of democracy, disclosure standards, efficiency and enforcement abilities of the legal system, property rights enforcement, corporate control climate, and the overall rule of law on a nation by nation basis. Table 3 contains the values for the country-level governance characteristics utilized in the subsequent analysis, while Table 4 illustrates the correlation of the various proxies. To alleviate concerns centered on multicollinearity

of my independent variables, I demonstrate a number of variations of my base model in the multiple regression section (Table 7).

Table 5 presents univariate comparisons of underpricing for events above and below the mean value for each governance characteristic utilized in this study. P-values resulting from tests of equality of means are also presented in the final column. The results in Table 5 indicate that underpricing is significantly greater for IPOs taking place in the presence of higher levels of antidirector rights, CEO turnover, creditor rights, democracy, corporate control activity, property rights, and rule of law. Underpricing is lower when measures of accounting standards, disclosure standards and public law enforcement are higher. Finally, the difference in underpricing for events above and below the mean value of efficiency of the judiciary is not significant. Overall, these results offer preliminary evidence of an association between underpricing and country-level governance characteristics.

*B. Single measure regression analysis*

While Table 5 presents unconditional evidence of an association between underpricing and country-level governance, a more detailed examination is necessary. Table 6 controls for factors related to underpricing identified by earlier studies while introducing single measures of country-level governance. Each regression in the remaining analysis includes five control variables as well as year and industry dummy variables. The year dummies are generally not significant, with the exception of the 2004 dummy which is often positive and significant, while the hi-tech industry dummy is the only industry dummy variable that exhibits any statistical significance, generally

indicating a positive and significant coefficient. These results are consistent with Figures 3 and 5 detailed in the descriptive statistics discussion above.

The control variables utilized in Table 6 include a stock market turnover ratio as reported in Beck, Demirgüç-Kunt, and Levine (2000), an indicator variable set to one if the offer price is an integer value, the (log) size of the offer in U.S. dollars, a variable measuring the recent new issue activity in the listing country, and the market returns in the country of listing over the three months prior to the month of issuance. These control variables are included to account for a number of empirical regularities identified in the IPO underpricing literature. The turnover ratio, defined by Beck, Demirgüç-Kunt, and Levine as dollar volume divided by (deflated) market capitalization, represents a proxy for the liquidity of the stock market in the country of listing by event year. If IPOs are underpriced to improve post-issue liquidity, underpricing should be higher in countries exhibiting less liquidity. Bradley, Cooney, Jordan, and Singh (2004) hypothesize that offerings issued at integer values are more uncertain than IPOs priced at more refined values. The IPO literature predicts that more uncertain offerings will exhibit larger first day returns, therefore offerings priced on an integer are expected to be more severely underpriced.

Offer size can proxy for a number of factors including the information asymmetry surrounding the offering. Larger offerings are likely to present less information asymmetry as investors are expected to require and receive more information on these offerings during the bookbuilding process. Additionally, larger offerings are more likely to come from more established, older, and more profitable firms. As such, a negative relation between initial returns and offer size is anticipated. IPO activity is measured as

the ratio of the total number of IPOs in the issue year and the total number of firms listed in the country in 2000. This variable is intended to control for hot issue markets and is expected to exhibit a positive relation with initial returns. The final control variable in Table 6 examines the market returns in the listing country in the three months prior to the new issue. This variable may also capture the hot issue market phenomenon while representing a more general gauge of the market conditions prevailing in the listing country at the time of the issue. The control for recent market returns is expected to exhibit a positive coefficient, as IPOs issued during times of recent overall market success are greeted more favorably by investors, leading to greater initial gains.

The first regression model presented in Table 6 highlights the relation between initial returns and the control variables. This base model highlights a significant, positive relation between underpricing and the liquidity control, integer offer price dummy and recent market returns and a consistent, negative association between underpricing and offer size. The relation between underpricing and the proxy for recent IPO activity is not significant in the base regression, but exhibits the expected positive and significant association in many subsequent regressions. The relations between initial returns and the control variables generally continue to hold as the governance proxies are added to the regression equation on an individual basis in subsequent models.

Table 6 model 2 explores the relation between initial returns and accounting standards where higher accounting standards represent countries with more informative financial statements, based on a survey of the inclusion or omission of 90 items (LaPorta et al., 1998). The coefficient on the accounting standards proxy is not significant. Model 3 illustrates that underpricing is significantly higher in countries offering greater

shareholder protection, as measured by the antidirector rights index. The available CEO turnover data is for the period 1993-1998, requiring the construction of a general proxy to measure the managerial labor market.[3] Aggregate CEO turnover is constructed by country for the 1993-1998 period. The aggregate level of turnover is then divided by the number of publicly listed firms as of the year 1996 for the country of origin to construct the CEO turnover proxy. The coefficient measuring the relation between CEO turnover and underpricing is positive and statistically significant as illustrated in Model 4. Like the shareholder rights index, the index of creditor rights exhibits a positive relation with underpricing. In the final model of Panel A, the relation between initial returns and the level of democracy, where higher democracy scores represent "higher degrees of institutionalized democracy" (LaPorta et al., 2006), is positive and statistically significant.

Panel B of Table 6 examines the remaining country-level governance proxies. The relation between initial returns and a country's disclosure standards is not statistically significant. The efficiency of the judiciary is positively associated with underpricing as detailed in model 8. As is the case with the CEO turnover proxy, the merger and acquisition activity proxy is measured at the country of origin level, as the country of origin is a better reflection of the corporate control climate surrounding the firm producing the new offering. Corporate control activity is calculated for each country and sample year as the number of completed mergers and acquisitions listed in *Thomson Financial's SDC Platinum Mergers and Acquisitions Database* divided by the number of publicly listed firms as of the year 2000 for the country of origin. Consistent with Boulton (2006), Table 6 model 9 illustrates that in countries with a more active market

[3] The author thanks Hazem Daouk for providing the CEO turnover data used in this study.

for control, IPO underpricing is greater on average. This result is further evidence that IPO underpricing may be used by management to maintain control when other mechanisms reduce their ability to control the firm.

Additional models examining the relation between underpricing and property rights, public law enforcement, and the rule of law close out Table 6. The relation between underpricing and property rights is positive and significant, as is the association between underpricing and the rule of law. The only proxy examined in Table 6 that presents a result counter to the hypothesis of this study is the public enforcement index, which contains a negative and significant coefficient in model 11. A later section decomposes the public enforcement index into its individual components to shed some additional light on this interesting result. Otherwise, the results in Table 6 support the notion that IPO underpricing is greater in sample countries with stronger governance, exactly the countries where management is hypothesized to utilize substitute mechanisms to maintain control of the firm.

*C. Multi-measure regression analysis*

Table 7 examines the relation between IPO underpricing and governance by considering multiple governance proxies in each regression model. The proxies carried forward to table 7 represent the governance proxies that are statistically significant in the table 6 models when considered individually. Regressions of the control variables, year and industry dummies along with various combinations of the antidirector rights index, creditor rights index, CEO turnover, level of democracy, efficiency of the judiciary, control activity, property rights, public enforcement index, and rule of law provide convincing evidence in support of the hypothesis at the center of this study. Each of the

models of table 7 include the antidirector rights index and creditor rights index as these represent the most direct measures of investor protection utilized in this study. Additionally, based on the strength of the relation between underpricing and the public enforcement index, this proxy is also included in each regression in Table 7.

The control variables generally continue to exhibit the relations established in the single governance metric regressions of Table 6 as IPOs issued in more liquid markets and offerings following large recent market returns are associated with higher initial returns while offer size and underpricing are negatively related. While the proxies for issue uncertainty and recent IPO activity are not always significant, they do exhibit the expected, positive relation with underpricing in the models in which they are statistically significant. The individual proxies for country-level governance continue to support the hypothesis predicting a positive relation between governance and underpricing. Shareholder and creditor rights consistently exhibit a positive relation with underpricing, indicating that greater investor protections are associated with larger first day returns. The public enforcement index continues to exhibit a negative relation with underpricing, suggesting that in countries with stronger enforcement of securities laws, initial returns are smaller, on average. Of the remaining governance variables, only the proxy for corporate control activity demonstrates a positive and significant relation with underpricing in each model in which it enters, implying that underpricing is generally greater in countries with more active takeover markets.

The proxy for a country's level of democracy is not significant in either of the two models in which it appears. Efficiency of judiciary is significant when combined with the antidirector rights index, creditor right index and public enforcement index, but loses

its statistical significance in the all-inclusive final model. Finally, the property rights index exhibits a positive relation with underpricing, while the rule of law is negatively associated with underpricing in the final model. Overall, the proxies for corporate control examined in Tables 6 and 7 provide strong support for the hypothesis that underpricing is a mechanism used by management when substitute instruments for maintaining control are less accessible. In particular, when the rights of investors are protected by law and societal norms and when the market for corporate control is active, managers use underpricing to maintain control of the firm in a manner consistent with Brennan and Franks' reduced monitoring hypothesis.

*D. Governance proxy component regressions*

A number of governance proxies utilized in prior tables represent indexes of multiple governance characteristics. For example, the antidirector rights index is comprised of six components shareholder rights including: (1) the ability to mail proxy votes, (2) no blocking of shares prior to meetings, (3) cumulative voting provisions, (4) oppressed minority mechanisms, (5) minimum share requirements for calling extraordinary shareholders meetings, and (6) preemptive rights (LaPorta et al. 1998). Further information on the components of the indexes utilized in this study is given in Table 3.

Table 8 examines the components of three of the prominent indexes used in this study, the antidirector rights index (Panel A), the creditor rights index (Panel B), and the public enforcement index (Panel C). The relation between underpricing and these indexes was discussed in detail in the previous section. The goal of this section is to drill down into the individual indexes to determine which factors drive the positive relation

between underpricing and antidirector and creditor rights and the negative relation between initial returns and the public enforcement index.

Table 8, Panel A examines the components of the antidirector rights index. The regression includes the standard control variables utilized in earlier models as well as year and industry dummy variables. Based on the results of this regression, a single component of the antidirector rights index drive the positive relation between IPO underpricing and shareholder rights, the absence of rules blocking shares before shareholder meetings. The ability to mail proxies, cumulative voting provisions, and preemptive rights are negatively related to underpricing. Finally, the coefficients on the oppressed minority mechanism proxy and the variable controlling for the minimum percentage of share capital required to call a shareholder meeting are not significant.

Three of the four components of the creditor rights index appear to drive to the positive relation between creditor rights and IPO underpricing (Table 8, Panel B). Coefficients on the proxies for restrictions on chapter 11 filing, adherence to priority of claims upon asset disposition, and removal of management upon bankruptcy filing are positive and statistically significant. The ability of creditors to gain possession of assets when a reorganization petition if filed is negatively related to underpricing. These results illustrate the specific rights that drive the positive relation between underpricing and creditor rights identified in earlier regressions.

Panel C of Table 8 presents the analysis of the components of the public enforcement index. Recall the strong negative relation between underpricing and the public enforcement index identified in Table 6. The Table 8 results indicate that this negative relation is driven by three factors: the characteristics of the supervisor with

oversight of the country's main stock exchange, power of the supervisor to make rules, and the availability of criminal sanctions for individuals issuing misleading financial statements. On the other hand, there exist positive relations between underpricing and the investigative and order issuing powers of the supervisor in charge of the country's main stock exchange, although these relations are overwhelmed by the negative relation between underpricing and the other components when the measures are combined to form a single, public enforcement index. Overall, the decomposition of the antidirector rights index, creditor rights index, and public enforcement index serve to more specifically identify the cause of the relation between underpricing and these governance proxies.

*E. Robustness checks*

Several robustness checks confirm the positive relation between underpricing and country-level governance. The first robustness check examines the impact of the large number of U.S. offerings on the results. New issues in the United States dominate the sample, representing over 20 percent of the IPO events. To determine if the results are driven by listings in the U.S., the empirical results were replicated excluding U.S.-listed IPOs. Excluding these IPOs also removes the majority of cross-listed firms, as most of these firms list on a U.S. exchange. Overall, the empirical results change little under this modification, confirming that the results are not driven by firms listed in the U.S.

Two sample countries, France and Taiwan, impose daily volatility limits on security returns during the sample period, potentially muting the effects of IPO underpricing in those nations. Following the methodology established by Ljungqvist (2005), underpricing in France and Taiwan is measured using the first observation five days after the initial public offering in the above analysis. To examine the impact of this

adjustment, the entire analysis is performed excluding all offerings listed in France and Taiwan. Exclusion of these two countries reduces the sample size by eliminating 222 French and 333 Taiwanese IPOs meeting the sample criteria. The results remain essentially unchanged, with consistently strong evidence that managers underprice more in countries where substitute control mechanisms are unavailable. In particular, underpricing is larger in countries offering greater shareholder protections, in nations with better enforcement of property rights, and in countries with more corporate control activity.

## 5. Conclusions

The results suggest that IPO underpricing is greater in countries offering stronger protections to investors after controlling for additional factors identified in the literature related to initial returns. The results hold for various country-level proxies of investor protection, and are both economically and statistically significant. Viewed in the context of Brennan and Franks' (1997) reduced monitoring hypothesis, these results are consistent with the hypothesis that managers use underpricing as a mechanism to preserve control of the firm when other avenues for maintaining control are unavailable. In countries that offer lower levels of investor protection, underpricing is less likely to be used as an instrument to maintain control because managerial control is implicit due to the general disregard for investor's rights. It must be noted that I have provided no evidence for or against the effectiveness of underpricing as a means for maintaining control. An interesting area of follow up would be to determine the success of underpricing as a method for maintaining control, as was done by Smart and Zutter

(2003) in their examination of dual-class IPOs and Boulton (2006) for a sample single-class U.S. IPOs.

The results presented here are also consistent with various studies examining issues of ownership structure related to the IPO. Zingales (1995) and Mello and Parsons (1998) hypothesize that one goal of the IPO is the creation of a dispersed outside ownership structure. A dispersed outside ownership structure facilitates managerial control over the firm, while also allowing management to determine the terms under which a transfer of control should take place. In the presence of strong investor protections, a dispersed outside ownership structure becomes more important for maintaining managerial control. In the context of this paper, underpricing is a substitute mechanism which allows management to maintain or even strengthen control over the firm.

While maintaining control is one of many potential motivations for underpricing initial public offerings, the evidence provided here is convincing and consistent in its support of the reduced monitoring hypothesis. However, there are undoubtedly additional factors that are related to underpricing which are not explored here. Additionally, because of the enormous data requirements to explore all of the variations in the IPO events, the proxies and controls utilized in this study are necessarily general. As data availability improves for international markets, further refinements of this topic may evolve and shed additional light on the relation between underpricing and governance.

## Chapter Two – IPO Underpricing and Corporate Control

### 1. Introduction

The spectacular first day gains realized by many initial public offerings (IPOs) is a subject that has fascinated investors, practitioners, and researchers for decades. Academic studies focus a great deal of attention on trying to explain why companies are willing to offer their shares to the public at an apparent discount. Dozens of possible explanations exist, including information acquisition (Benveniste and Spindt, 1989), the "winner's curse" (Rock, 1986), legal liabilities (Tinic, 1986), control considerations (Brennan and Franks, 1997), and a desire for top-ranked analyst coverage (Loughran and Ritter, 2002).

The corporate control literature documents waves in merger and acquisition activity over time and offers various explanations for this clustering of activity. Events such as deregulation have the ability to significantly alter an industry's landscape, making it optimal to reallocate assets among firms through mergers and acquisitions. Additionally, innovations in financing have contributed to these waves by providing the funds required to pursue such transactions (Jarrell, Brickley and Netter 1988). Corporate control activity has the ability to significantly alter management's authority over the firm as they are often replaced, and at a minimum lose influence, when their firm is acquired. Numerous studies have examined the actions employed by management to insulate their firm from the market for corporate control. For example, Field and Karpoff (2002) study the frequency and effectiveness of antitakeover mechanisms in place at the time of the IPO.

The present study examines the relation between the first day returns to initial public offerings and the corporate control environment. A number of studies, including

Zingales (1995), Brennan and Franks (1997), Mello and Parsons (1998), Stoughton and Zechner (1998) and Bebchuk (1999) examine the IPO and its relation to the firm's post-IPO ownership structure. For example, Brennan and Franks posit that underpricing is used strategically by the issuer to influence the dispersion of shares in the aftermarket. This greater dispersion of shares results in the presence of fewer influential blockholders, resulting in a stronger controlling position for the manager-entrepreneur. An active market for corporate control can make management's ability to maintain control of the firm tenuous. If management is threatened by the market for corporate control, they are forced to pursue other methods to strengthen their hold over the firm. The hypothesis presented here is that underpricing is one mechanism used by management to maintain control of the firm, resulting in greater underpricing when the corporate control market is more active.

Utilizing over 2,300 new issues listed in the United States encompassing much of the 1990s, trends in new issues, underpricing and corporate control activity are documented across the sample period. The primary result of this study identifies a positive relation between first day returns on initial public offerings and corporate control activity. This relation is robust to the standard control variables employed in earlier underpricing studies including event specific characteristics and macroeconomic conditions.

The empirical analysis continues by demonstrating that firms taken public in active corporate control markets are significantly more likely to be acquired in the subsequent five years. This relation between control activity and acquisition probability diminishes as the firm moves further from the IPO. Additionally, initial returns and post-

IPO institutional blockholdings are found to be negatively related. Specifically, greater underpricing is associated with smaller post-IPO average and maximum institutional blockholdings on average. Like the relation between pre-IPO control activity and the probability of being acquired, the relation between institutional blockholdings and first day returns weakens in the years following the IPO. Hence, the benefits of underpricing are not infinitely lived, but appear to fade over time. Finally, a positive relation between the probability of being acquired and average and maximum institutional blockholdings is documented. Firms with larger institutional blocks in place following the IPO are more likely to be taken over up to five years after going public. Together, these results support the hypothesis that managers underprice to influence ownership structure following the offering, which reduces the firm's exposure to the market for corporate control by reducing outside owners' incentive to monitor management.

Zingales (1995) proposes that the IPO represents the first step in transferring ownership of the firm. At first blush, the positive relation between corporate control activity and initial returns documented here might appear inconsistent with Zingales' hypothesis. However, the hypothesis of Zingales and the explanation offered here are not mutually exclusive. Instead of interpreting the results as indicative of management seeking to prevent all control activity from impacting the firm, a more inclusive interpretation is that management desires to maintain control of the firm to ensure that if the firm is acquired, the takeover is on terms which they deem favorable. By maintaining control of the firm following the IPO, management is able to choose when and if the firm is acquired and can maximize the value of their controlling stake. This interpretation is

also consistent with the theoretical papers of Mello and Parsons (1998) and Bebchuk (1999).

The remainder of this paper is structured as follows. Section 2 discusses previous research on the benefits of control, IPO underpricing, and corporate control related to this study. Section 3 describes my sample construction process and the methodology utilized in the analysis. Section 4 documents and interprets a strong, positive relation between corporate control activity and initial returns and presents evidence consistent with the hypothesis that underpricing facilitates managerial control over the firm, while Section 5 summarizes and concludes.

## 2. Previous research

### *A. Managerial control*

Control of the firm, and the accompanying benefits, has a number of implications in finance research. A large body of literature, centered on the work of Jensen and Meckling (1976), examines the mechanisms designed to align the interests of controlling and minority shareholders. Such mechanisms include firms-specific characteristics such as the board of directors, the design of managerial compensation plans, and the structure and size of managerial and block ownership positions as well as external influences such as the managerial labor market and the market for corporate control. Each of these governance mechanisms plays a role in providing incentives for management to make decisions not only with their own interests in mind, but also the interests of other stakeholders of the firm, particularly shareholders. For example, the market for corporate control is expected to align the interests of management and shareholders by reallocating underperforming resources to positions where their value may be maximized. As the market for corporate control reallocates a firm's resources, the influence of the target

firm's management is at a minimum significantly diminished but often eliminated altogether (Jensen, 1988).

A primary area of study related to control explores the actions which managers and entrepreneurs take in an effort to maintain and strengthen their hold on the firm. Such actions include, but are not limited to, maintaining controlling ownership stakes (Demsetz and Lehn, 1985), the implementation of dual class structures (Nenova, 2003), the configuration of the board of directors (Baker and Gompers, 2004), and diversification of the firm's operations (Shleifer and Vishny, 1989). The primary takeaway from the literature on control for the purposes of this study is that control has inherent value. Because control has value, managers have incentive to take actions which allow them to maintain, or even strengthen, their control over firms. The devices available depend on the environment in which the firm operates and management's behavior is influenced by the mechanisms at their disposal which facilitate their goal to control the firm.

A number of theoretical works consider issues of control while focusing on the firm's initial public offering and subsequent ownership structure. Zingales (1995) hypothesizes that the IPO represents the first step in the transfer of control of the firm from the entrepreneur to a new owner. In Zingales' model, the entrepreneur uses the IPO to assemble the ownership structure that allows him to maximize his proceeds in an eventual control transaction. Zingales' model suggests that the value of cash flow rights are maximized by selling to dispersed shareholders, for which the IPO is ideally suited. On the contrary, the value of the entrepreneur's control position is maximized by

bargaining directly with potential suitors, which is expected to occur subsequent to the IPO.

Like Zingales, Mello and Parsons (1998) hypothesize that it is optimal to sell shares to small, dispersed investors at the time of the IPO with the transfer of control occurring at a later date. By selling to small investors through the IPO, the seller gathers information that helps him maximize his proceeds in a subsequent control transaction. For example, the sale of shares to small investors in the IPO and subsequent trading in the secondary market establish a market price for the firm which may aid the entrepreneur in gauging demand and negotiating the sale of the control block. Alternatively, Stoughton and Zechner (1998) posit that the optimal strategy is to establish large blockholders as part of the IPO. In their model, the presence of sizeable blockholders increases the value of the firm through increased monitoring of management, allowing for the sale of subsequent shares at a higher price.

Bebchuk (1999) introduces the size of the private benefits of control into the discussion of ownership structure and the IPO. Bebchuk hypothesizes that as the benefits of control become larger, it is optimal for the entrepreneur to maintain control of the firm to discourage outsiders from making the firm a target. Additionally, like Zingales and Mello and Parsons, Bebchuk posits that maintaining control at the time of the IPO allows the initial owner to maximize his proceeds in a subsequent control transfer. Finally, Bebchuk suggests two primary motivations for the use of antitakeover devices, to prevent unwanted acquisition attempts and to increase the entrepreneur's proceeds in a successful transfer of control.

*B. IPO underpricing*

A significant amount of empirical research, dating back at least to Ibbotson's (1975) study documents short-run underpricing of initial public offerings in the United States. Similar studies present consistent evidence of short-run underpricing of initial public offerings in many international markets (Loughran, Ritter, and Rydqvist, 1994). In sum, the underpricing of IPOs across time and countries is well established. IPO underpricing continues to interest investors, practitioners, and researchers who seek to explain why managers are willing to offer ownership stakes in the firm at an apparent discount.

Theories of IPO underpricing began to appear shortly after the introduction of the literature documenting the large initial returns to new issues. Characteristics of the issuing firm, the issue, and the general market climate have all been cited as possible determinants of IPO underpricing. Benveniste and Spindt (1989) hypothesize that underpricing is used to acquire information from potential purchasers of the issue. As such, underpricing is partially a cost of acquiring information during the bookbuilding process. Carter and Manaster (1990) conjecture that firms use prestigious underwriters to signal low risk in an effort to combat the effects of information asymmetry. Consistent with their hypothesis, they find that firms using more reputable underwriters exhibit lower initial returns on average. Additional theories of IPO underpricing include the "winner's curse" hypothesis of Rock (1986), information cascades (Welch, 1992), legal liability avoidance (Tinic, 1988), an absence of motivation to avoid underpricing (Habib and Ljungqvist, 2001) and "analyst lust" (Loughran and Ritter, 2002).

Brennan and Franks (1997) and Smart and Zutter (2003) present theoretical and empirical support for the notion that management uses underpricing as a mechanism to

maintain control. Utilizing a sample of U.K. IPOs, Brennan and Franks present empirical evidence consistent with their hypothesis that underpricing is used to strategically influence a dispersed outside ownership structure, reducing the likelihood that ownership blocks are formed at the time of the issue. By reducing the probability that ownership blocks are formed at the time of the offering, the likelihood of management maintaining effective control of the firm is increased, allowing them to continue to enjoy the private benefits that accompany the position of control. While it is possible that ownership blocks are formed following the issue, the initial dispersed ownership structure makes it more costly to form these blocks.

In a unique test of the Brennan and Franks "reduced monitoring hypothesis," Smart and Zutter compare single- and dual-class issues in the United States and find lower levels of underpricing for dual-class offerings. Their empirical results are consistent with the reduced monitoring hypothesis as managers of dual-class firms have a substitute mechanism at their disposal for maintaining control of the firm, namely the ownership of the class of stock imparting superior voting rights. The presence of this substitute mechanism reduces the need to underprice shares since a dispersed ownership structure is no longer a necessity due to the superior voting rights stock which provides the control that management desires. In effect, the dual-class structure guarantees this control, reducing the need for substitute mechanisms, such as IPO underpricing.

Field and Karpoff (2002) provide additional evidence consistent with the reduced monitoring hypothesis. In particular, the authors document that takeover defenses are employed by a significant number of firms at the time of the initial public offering and that these mechanisms are effective in allowing management to maintain control of the

firm. Contrary to studies supporting the reduced monitoring hypothesis, Arugaslan, Cook, and Kieschnick (2004) conclude that monitoring is not a significant motivation for offer underpricing. They argue that earlier tests fail to consider important determinants of underpricing and institutional ownership, most importantly firm size, which led to results supportive of the reduced monitoring hypothesis.

Boulton (2006) examines the relation between IPO underpricing and proxies for investor protection across a sample of 24 countries and nearly 4,700 events. He identifies a positive relation between investor protection and first day returns which is interpreted as consistent with the hypothesis that underpricing is a mechanism used by management to maintain control of the firm. Boulton notes that investor protections weaken managerial control in a number of ways. Two examples include shareholder rights which provide means for shareholders to discipline or remove poorly performing management and creditor rights which allow creditors to remove assets from managerial control in bankruptcy and remove management from their position of control when the firm defaults. Because such protections threaten managerial control, management has the incentive to use substitute mechanisms to strengthen control over the firm when investor protection is strong, consistent with the positive relation between investor protection and underpricing.

*C. The market for corporate control*

The market for corporate control has spawned a rich literature examining topics including the motivations for pursuing takeovers and the steps pursued by management to defend against becoming a target. A subset of the corporate control literature focuses on

merger waves and develops hypotheses aimed at explaining why control activity clusters over time and within industries.

Studies examining the motivations for takeovers have proposed a number of hypotheses, including: synergy (Bradley, Desai, and Kim, 1983, 1988), hubris (Roll, 1986), and agency issues (Lang, Stulz, and Walkling, 1989, 1991). The primary distinction between the three competing explanations is the expected wealth effects of the event. Mergers motivated by synergy are expected to result in positive aggregate wealth effects for the combined participants. Hubris inspired events have an expected wealth effect of zero, with any gains realized by the target perfectly offset by losses to the bidding firm. Finally, agency explanations predict negative net wealth effects, as positive gains to target firms are overwhelmed by the negative returns to bidder firm shareholders.

Finance offers a simple objective for management, maximize shareholder value. However, agency problems often result in misalignment of incentives between management and shareholders. One way to realign the incentives of management and shareholders is to remove the underperforming managers from power and replace them with others who are better able to maximize shareholder value. Corporate control events can facilitate this replacement by reallocating the firm's assets to an organization where they have a higher value. However, management often loses a great deal in such events, as their position of control is usually eliminated. This motivates management to take actions aimed at reducing the probability the firm will be taken over.

DeAngelo and Rice (1983) examine the passage of antitakeover amendments generally thought to entrench management, including: staggered boards, supermajority approval, fair merger price provisions, and lockup provisions. Stulz (1988) shows that

increased control of voting rights by management decreases the value of the firm to a potential bidder. In Stulz's analysis, capital structure changes are used to concentrate voting rights in the hands of management, making capital structure a method for entrenching management by sheltering them from takeover activity. Safieddine and Titman (1999) empirically examine targets of takeover activity that were successful in warding off overtures and find that a takeover is less likely to succeed when debt levels are significantly increased. Finally, Field and Karpoff (2002) examine takeover defenses utilized by firms at the time of their initial public offering and find that the presence of a takeover defense is positively related to the firm remaining independent in the future. Overall, there is a rich body of research documenting various actions that management has at their disposal to avoid becoming the target of a takeover, including the use of poison pills, staggered boards, and dual-class structures.

A number of papers document and examine patterns in corporate control activity including time and industry clustering. In a study of the active corporate control market of the 1980s, Jarrell, Brickley, and Netter (1988) attribute the takeover wave of that decade to relaxed antitrust enforcement, deregulation in a number of industries, and innovations in financing. Mitchell and Mulherin (1996) cite additional factors inducing corporate control waves including energy price volatility and foreign competition. Harford (2005) finds support for the neoclassical model of takeover activity, concluding that clusters of takeover activity result when industries respond to economic, regulatory, and technological shocks. Harford cites another important enabler, capital market liquidity, which provides the funds needed to reallocate assets when shocks make it

optimal to do so. In sum, much like the literature examining hot issue markets for initial public offerings, it has been established that there are waves in corporate control activity.

## 3. Sample selection and descriptive statistics

### *A. Sample selection*

The sample of initial public offerings is extracted from the *Disclosure New Issues* database from Disclosure, Inc. All firm-commitment new issues for the period January 1990 through September 1998 are included with the exception of dual-class firms, closed-end funds, unit offers, investment companies, real estate investment trusts, and limited partnerships which are typically excluded in underpricing studies. Elimination of duplicate records and additional data requirements results in a final sample of 2,363 IPOs with a minimum offer price of $5.

The sample of corporate control announcements is extracted from Thomson Financial's *SDC Mergers and Acquisitions* database. To be included in the construction of the corporate control activity proxies a deal must meet the following criteria: a minimum deal value of $1 million, public or private target status, and a deal status of completed, unconditional, or withdrawn. For the January 1989 through August 1998 period, 23,068 deals met the selection criteria. The resulting deals are used to construct 3, 6, and 12-month proxies based on the number of deals and the total dollar volume of deals. The deal based proxy is normalized by the number of Compustat-listed firms for the year in question, while the dollar based proxies are developed by normalizing the total dollar volume of deals by the market capitalization and the total asset base of all Compustat-listed firms for a given year. These proxies are further refined to measure control activity within the Fama and French (1997) industry classifications.

Institutional ownership data is retrieved from Thomson Financial's *CDA/Spectrum (13f) Institutional Holdings* database for the five years following each initial public offering. Institutional ownership data is available for 2,055 firms for the quarter following the IPO. The number of firms with institutional ownership data declines to 1,261 five years after the IPO event due to a number of factors including acquisitions, bankruptcies, and delistings. The primary institutional ownership proxy utilized in this study is the percentage of the firm's shares held by the average institutional blockholder. As an alternative proxy, a number of results are illustrated using the percentage of shares outstanding held by the largest institutional shareholder. These proxies are constructed one quarter following the IPO as well as one through five years later.

*B. Descriptive Statistics*

Figure 6 plots average underpricing and a measure of corporate control activity on a single graph for illustrative purposes. In this case, the measure of corporate control is the number of merger and acquisition announcements in the prior three calendar months. The left axis and vertical bars correspond to average underpricing, while the right axis and square line represents corporate control activity. Finally, a trendline detailing the evolution of underpricing across the sample period is presented. Figure 6 details an increase in the level of corporate control activity during the sample period. Additionally, the trendline illustrates a similar increase in average underpricing over the same timeframe. To control for the effects of time, year dummy variables are included in the subsequent analysis.

Table 9 presents descriptive statistics for my sample of IPOs, corporate control transactions, and institutional ownership by year and industry. Industry classifications in this table are identical to those utilized in Dyck and Zingales (2004) with the addition of a high tech industry classification using the hi-tech SIC codes identified by Ljungqvist and Wilhelm (2003). For each year, the first row lists the number of initial public offerings in the industry, while the second row details average underpricing. Row 3 presents the number of corporate control transactions in the industry, while row 4 details the percentage of the firm owned by the average institutional blockholder one year after the IPO event. Table 9 shows results consistent with prior IPO and merger and acquisition studies in that the sample is dominated by the usual suspects, including the manufacturing, financial, services, and high tech industries. Underpricing is consistent with prior studies, falling in the 8-20% range in most instances, while average institutional ownership generally falls between 1-2% of the firm one year after the IPO. To control for industry trends, industry dummy variables developed using the Fama and French industry classifications are utilized in the analysis. Overall, the descriptive statistics illustrate that the sample is well represented by new issues and corporate control activity in various industries across the sample period.

## 4. Empirical Results

### *A. Relation between underpricing and corporate control activity*

Table 10 details the results of three sets of regressions designed to examine the relation between IPO underpricing and the prevailing corporate control climate. Proxies for corporate control activity are based on the number of deals (Panels A) as well as the aggregate deal value (Panels B and C). Panel A normalizes the number of deal announcements by the number of Compustat-listed firms, Panel B normalizes aggregate

deal value by the total industry market capitalization, while the denominator of Panel C is the total asset base, each within the appropriate Fama and French industry grouping. Each panel exhibits the results for the control proxies based on merger and acquisition activity for the three, six and twelve months preceding the IPO event.

The IPO underpricing literature has identified a number of factors thought to be related to initial returns. A standard proxy in IPO underpricing studies is the size of the IPO offering (Ritter, 1984). Offer size may reflect a number of factors, including offer risk and information asymmetry. To control for the effects of offer size, the log of the offer value is included as a control variable. One possible alternative explanation for a relation between corporate control activity and IPO underpricing is capital market liquidity. It may be the case that these events appear related because they are both associated with the availability of capital. Two variables are included to control for this possibility. *The capital market liquidity control represents "the spread between the average rate charged for commercial and industrial loans and the fed funds rate,"* as reported in Harford (2005).[4] A second control variable, the hot issue dummy, is motivated by studies documenting waves in IPO activity, including Ritter (1984). Motivated by the methodology utilized by Helwege and Liang (2004), this dummy is set to one when the three-month centered moving average of the number of new issues is in the top quintile, when measured over the sample period.

Hanley (1993) demonstrates a positive relation between offer-price revision and initial returns. Controls for offer price revision and positive price revisions are included to account for this empirical regularity. A number of studies examine the characteristics of the investment bank, auditor and other participants in the IPO process. Carter and

[4] The author thanks Jarrad Harford for providing the data for constructing this variable.

Manaster (1990) and Megginson and Weiss (1991) find a negative relation between IPO underpricing and underwriter reputation. As such, the Megginson-Weiss measure, labeled underwriter market share, is included in many subsequent regressions. Barry, Muscarella, Peavy, and Vetsuypens (1990) identify a negative relation between underpricing and venture capital backing. More recently, Loughran and Ritter (2004) find a positive relation between the presence of venture capital backing and first day returns to new issues. Likewise, Michaely and Shaw (1995) document a negative relation between auditor quality and initial returns. Dummy variables denoting venture capital backing and the presence of a first tier auditor are included in the underpricing regressions based on these earlier studies.

Numerous deal characteristics are thought to be associated with underpricing. Dummies for equity carve-outs, reverse LBOs, and Nasdaq listed firms are included in all underpricing regressions. Additionally, Field and Karpoff (2002) document the regularity with which firms utilize antitakeover provisions at the time of the IPO. The presence of antitakeover provisions, which have the potential to insulate management from the market for corporate control, is identified with a dummy variable. Bebchuk and Ferrell (2002) identify three states with relatively stringent antitakeover laws relative to the rest of the country. A dummy variable identifies IPOs issued by firms headquartered in Massachusetts, Pennsylvania, and Ohio. Lastly, firms not anticipated to pay dividends and the market return over the 22 trading days prior to the IPO event are included as control variables.

Table 10, panel A presents the underpricing regressions utilizing the normalized number of deals in the three, six and twelve months leading up to the IPO as the proxy

for the corporate control climate. The regressions present strong evidence of a positive relation between corporate control activity and initial returns for each of the measurement windows. The magnitude of the coefficient is monotonically decreasing as the measurement window increases, suggesting that more recent control activity is more strongly related to initial returns. Overall, these results suggest that when corporate control activity is high, initial returns are larger.

The control variables in Table 10, Panel A are generally either insignificant or consistent with prior empirical literature. Larger offerings are underpriced less while offers that have a revised offer price exhibit larger initial returns, particularly those with an upward price revision. Underpricing is typically greater during periods when a large number of firms are coming to the market for the first time, as measured by the hot issue dummy variable. Generally, deals led by high reputation investment banks are underpriced more, as are venture capital backed deals. The positive relation between investment bank reputation and underpricing is consistent with the reversal of this relation in the 1990s identified by Loughran and Ritter (2004). Equity carveouts and reverse LBOs generally underprice less, while IPOs coming to market in the month following strong overall market returns exhibit larger initial returns, on average. The remaining control variables are generally not statistically significant.

Table 10, Panels B and C present results in line with those discussed above for alternate proxies for corporate control, including aggregate deal value normalized by total industry market capitalization (Panel B) and aggregate industry asset base (Panel C). Overall, the results presented in Table 10 offer strong evidence of a positive relation between the corporate control climate and IPO underpricing. These results are consistent

with the hypothesis that management uses underpricing as a means of maintaining control when taking the firm public by taking actions designed to create a dispersed outside ownership structure. The remaining empirical results seek to determine if this is necessary and more importantly, if it is effective.

*B. Corporate control climate and future takeover probability*

Table 11 explores the probability of firm survival as a function of the pre-IPO market for corporate control as well as several additional variables identified in the literature thought to be related to the likelihood that a firm is a takeover target. The first five columns of results utilize the normalized number of deals in the three months leading up to the offering as the proxy for activity in the control market, while the last five columns examine the aggregate deal value normalized by total industry assets over the prior six months. Logistic regressions are presented with the dependent variable equal to one if the firm is acquired in the first through fifth year following the initial public offering. Acquisitions are cumulative in the regressions, as a firm acquired in the first year is also coded as acquired in subsequent years. Control variables include a dummy variable identifying firms backed by venture capital funding, the (log) size of the offer, a sales to price multiplier, a measure of underwriter quality, and dummy variables for Nasdaq-listed firms, firms listed in a strong antitakeover state and firms with antitakeover provisions in place at the time of the offering.

The results of Table 11 document a positive relation between the corporate control climate in the months preceding the IPO and the probability that a firm is subsequently acquired. This result suggests that firms are more likely to be acquired in each of the first five years following an IPO when the market for corporate control is

active leading up to the offering, whether control activity is measured using the deal based or value based proxy. The coefficient on the control proxy generally declines in magnitude as the examination period progresses from one to five years following the IPO. This indicates that the market for corporate control prevailing at the time of the IPO, while related to the firm's ability to survive up to five years out, has stronger predictive ability in the short and medium term. Of the control variables, only the antitakeover state dummy is significant in any of the regressions, suggesting that firms are less likely to be taken over in the first two years after going private when incorporated in Massachusetts, Pennsylvania or Ohio. Overall, Table 11 confirms that the corporate control climate at the time of the IPO is positively associated with the firm's likelihood of subsequent takeover. If management recognizes this relation and desires to maintain control of the firm, they will take actions designed to decrease the likelihood of being acquired, or at a minimum, to allow them to determine the conditions of a future takeover.

*C. Underpricing's role in a dispersed ownership structure*

The hypothesis presented here is that managers underprice IPOs to induce rationing. Specifically, underpricing is used to discriminate against large bidders in an effort to bring about a dispersed outside ownership structure. Table 12 examines the role of underpricing in post-IPO block ownership to determine if greater underpricing is associated with dispersed ownership structures. The analysis in Table 12 represents ordinary least squares regressions of post-IPO institutional ownership on the IPO's initial return and several control variables thought to be related to ownership structure, particularly the (log) size of the offer, the reputation of the lead underwriter, and the

backing of venture capitalists. The dependent variable in Panel A of Table 12 is the percentage of the firm's shares held by the average institutional blockholder in the quarter immediately following the IPO and one through five years subsequent to the IPO. Panel B presents the results when using the percentage of the firm's shares held by the largest institutional blockholder subsequent to the IPO as the dependent variable.

Table 12, Panel A presents strong evidence that IPO underpricing and average institutional blockholdings are negatively related. Put simply, greater underpricing is associated with smaller institutional blockholdings, on average, up to five years following an offering. Panel B documents a negative relation between initial returns and the largest institutional blockholding up to one year following an event. Additionally, the coefficient on the initial return generally decreases in magnitude in the years following the IPO. This indicates that impact of IPO underpricing on institutional blockholdings diminishes as time passes. However, the results indicate that underpricing is related to average institutional blockholdings up to five years after the IPO. This is consistent with the motivation for underpricing offered here and in Brennan and Franks' study, as underpricing is related to dispersed outside ownership subsequent to the IPO. Interestingly, the control variable measuring the size of the offer indicates that larger offers have smaller average institutional holdings but larger maximum blockholdings, on average. Additionally, venture backed deals tend to have larger average and maximum institutional holdings. Overall, Table 12 presents evidence consistent with the hypothesis that underpricing is associated with a dispersed outside ownership structure. This evidence strengthens the hypothesis that underpricing is used strategically by management in an effort to maintain control of the firm.

*D. Underpricing and survival*

Tables 10 through 12 establish the following empirical regularities: IPOs are underpriced more on average when the market for corporate control is active, the pre-IPO market for corporate control is related to a firm's ability to survive in subsequent years, and IPO underpricing is associated with smaller post-IPO institutional blockholdings. These results provide the motivation for the hypothesis that IPO underpricing is utilized by management to maintain control when the corporate control climate threatens their hold on the firm. To complete the story, the relation between institutional ownership and firm survival must be established. Table 13 examines the relation between firm survival and institutional ownership, which represents the mechanism through with management attempts to maintain control. The dependent variable in the logistic regressions in Table 13 is set to one if the firm is acquired within the period under examination (two through five years post-IPO, year one is not considered due to the very small number of takeovers within the first year for sample firms) and zero otherwise. The predictive variables include post-IPO blockholdings and many of the control variables discussed in the presentation of the Table 11 results relating pre-IPO control activity to a firm's probability of survival.

The results of Table 13 demonstrate that a firm's probability of takeover up to five years subsequent to the IPO event is related to institutional blockholdings, as larger blockholdings are positively associated with the probability of takeover. This is true whether blockholdings are measured as average institutional holdings (Panel A) or maximum institutional blockholding (Panel B). The monotonic decline in the magnitude of the blockholding coefficient in the regressions in Table 13 aligns with intuition, as blockholdings immediately following the IPO become less important as time passes.

Overall, the results of Table 13 complete the story, as underpricing is related to smaller blockholdings (Table 12) and smaller blockholdings are related to lower takeover probability (Table 13).

## 5. Conclusions

While controlling for factors identified in the literature as associated with initial returns, IPO underpricing is found to be positively related to activity in the market for corporate control. The results hold for various proxies for corporate control activity, and are both economically and statistically significant. In addition to documenting the relation between underpricing and corporate control activity, I demonstrate that firms taken public in active corporate control markets are significantly more likely to be acquired in subsequent years. Additionally, greater underpricing is associated with smaller institutional blockholdings on average, confirming that underpricing is related to the ownership structure of the firm in the years following the IPO.

The remaining empirical results demonstrate that a firm is more likely to be acquired in the five years following the initial public offering when institutional holdings are larger. Together, these results imply that underpricing is effective in strengthening managerial control, at least to the degree that they are less likely to lose their position due to takeover. The results are broadly consistent with the hypothesis of Brennan and Franks (1997) which posits that IPO underpricing is used strategically by the issuer to influence the dispersion of shares in the aftermarket. This greater dispersion of shares results in the presence of fewer influential blockholders, resulting in a stronger controlling position for the manager. When the corporate control climate is active, management's position with the firm is at risk. Managers who seek to take their firm

public during an active period of corporate control may utilize underpricing to influence the ownership structure of the firm in an effort to protect their position of control.

The results presented here are also consistent with various studies examining issues of ownership structure related to the IPO. Zingales (1995) and Mello and Parsons (1998) hypothesize that one goal of the IPO is the creation of a dispersed outside ownership structure. A dispersed outside ownership structure facilitates managerial control over the firm, while also allowing management to determine the terms under which a transfer of control should take place. In the presence of an active corporate control market, a dispersed outside ownership structure becomes more important for maintaining managerial control. In the context of this paper, underpricing is a substitute mechanism which allows management to maintain or even strengthen control over the firm, providing management with the ability to direct the terms of any attempt to acquire the firm.

**Bibliography**

Arugaslan, O., Cook, D., Kieschnick, R., 2004. Monitoring as a motivation for ipo underpricing. Journal of Finance 59, 2403-2420.

Baker, M., Gompers, P., 2003. The determinants of board structure at the initial public offering. Journal of Law and Economics 46, 569-598.

Barry, C., Muscarella, C., Peavy, J., and Vetsuypens, M., 1990. The role of venture capital in the creation of public companies. Journal of Financial Economics 27, 447-471.

Bebchuk, L., 1999. A rent-protection theory of corporate ownership and control. Working paper 7203, NBER.

Bebchuk, L., Ferrell, A., 2002. On takeover law and regulatory competition. Business Lawyer 57, 1047-1068.

Beck, T., Demirgüç-Kunt, A., Levine, R., 2000. A new database on financial development and structure. World Bank Economic Review 14, 597-605.

Benveniste, L., Spindt, P., 1989. How investment bankers determine the offer price and allocation of new issues. Journal of Financial Economics 24, 343-361.

Bhattacharya, U., Daouk, H., 2002. The world price of insider trading. Journal of Finance 57, 75-108.

Bhattacharya, U., Daouk, H., 2005. When no law is better than a good law. Working paper, SSRN.

Bhattacharya, U., Daouk, H., Welker, M., 2003. The world price of earnings opacity. Accounting Review 78, 641-678.

Boulton, T., 2006. IPO Underpricing and Corporate Control. Working paper, University of Pittsburgh.

Boulton, T., 2006. International IPO underpricing and investor protection. Working paper, University of Pittsburgh.

Bradley, D., Cooney, J., Jordan, B., Singh, A., 2004. Negotiation and the ipo offer price: a comparison of integer vs. non-integer ipos. Journal of Financial and Quantitative Analysis 39, 517-539.

Bradley, M., Desai, A., Kim E., 1983. The rationale behind interfirm tender offers. Journal of Financial Economics 11, 183-206.

Bradley, M., Desai, A., Kim E., 1988. Synergistic gains from corporate acquisitions and their division between the stockholders of target and acquiring firms. Journal of Financial Economics 21, 3-40.

Brennan, M., Franks, J., 1997. Underpricing, ownership and control in initial public offerings of equity securities in the UK. Journal of Financial Economics 45, 391-413.

Carter, R., Manaster, S., 1990. Initial public offerings and underwriter reputation. Journal of Finance 45, 1045-1067.

Coffee, J., 1999. The future as history: the prospects for global convergence in corporate governance and its implications. Northwestern University Law Review 93, 641-708.

Coffee, J., 2002. Racing towards the top? The impact of cross-listings and stock market competition on international corporate governance. Columbia Law Review 102, 1757-1831.

DeAngelo, H., Rice, E., 1983. Antitakeover charter amendments and stockholder wealth. Journal of Financial Economics 11, 329-360.

Demsetz, H., Lehn, K., 1985. The structure of corporate ownership: causes and consequences. Journal of Political Economy 93, 1155-1175.

Dyck, A., Zingales, L., 2004. Private benefits of control: an international comparison. Journal of Finance 59, 537-600.

Fama, E., French, K., 1997. Industry costs of equity. Journal of Financial Economics 43, 153-193.

Field, L., Karpoff, J., 2002. Takeover defenses of ipo firms. Journal of Finance 57, 1857-1889.

Habib M., Ljungqvist, A., 2001. Underpricing and entrepreneurial wealth losses in ipos: theory and evidence. Review of Financial Studies 14, 433-458.

Hanley, K., 1993. The relationship of the offer price to the preliminary file range and the use of overallotment option in initial public offerings. Journal of Financial Economics 34, 231-250.

Harford, J., 2005. What drives merger waves? Journal of Financial Economics 77, 529-560.

Helwege, J., Liang, N., 2004. Initial public offerings in hot and cold markets. Journal of Financial and Quantitative Analysis 39, 541-569.

Ibbotson, R., 1975. Price performance of common stock new issues. Journal of Financial Economics 2, 235-272.

Jaggers, K., Marshall, M., 2000. Polity IV project, political regime characteristics and transitions, 1800-2000. Database Codebook.

Jarrell G., Brickley, J., Netter, J., 1988. The market for corporate control: the evidence since 1980. Journal of Economic Perspectives 2, 49-68.

Jensen, M., 1988. Takeovers: their causes and consequences. Journal of Economic Perspectives 2, 21-48.

Jensen, M., Meckling, W., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3, 305-360.

Kaufmann, D., Kraay, A., Mastruzzi, M., 2003. Governance matters III: updated governance indicators for 1996-2002. Working paper, World Bank.

Lang, L., Stulz, R., Walkling, R., 1989. Managerial performance, Tobin's q and the gains from successful tender offers. Journal of Financial Economics 24, 137-154.

Lang, L., Stulz, R., Walkling, R., 1991. A test of the free cash flow hypothesis: the case of bidder returns. Journal of Financial Economics 29, 315-336.

LaPorta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1997. Legal Determinants of external finance. Journal of Finance 52, 1131-1150.

LaPorta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1998. Law and finance. Journal of Political Economy 106, 1113-1155.

LaPorta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1999. Corporate ownership around the world. Journal of Finance 54, 471-517.

LaPorta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2000. Agency problems and dividend policies around the world. Journal of Finance 55, 1-33.

LaPorta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2000. Investor protection and corporate governance. Journal of Financial Economics 58, 3-27.

LaPorta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2002. Investor protection and corporate valuation. Journal of Finance 57, 1147-1170.

LaPorta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2006. What works in securities laws? Journal of Finance 61, 1-32.

Loughran, T., Ritter, J., Rydqvist, K., 1994. Initial public offerings: international insights. Pacific Basin Journal 2, 165-199.

Loughran, T., Ritter, J., 2002. Why don't issuers get upset about leaving money on the table in ipos? Review of Financial Studies 15, 413-444.

Loughran, T., Ritter, J., 2004. Why has ipo underpricing changed over time? Financial Management 33, 5-37.

Ljungqvist, A., 2005. IPO underpricing. Unpublished working paper, Tuck School of Business.

Ljungqvist, A., Wilhelm, W., 2003. IPO pricing in the dot-com bubble. Journal of Finance 58, 723-752.

Megginson, W., Weiss, K., 1991. Venture capitalist certification in initial public offerings. Journal of Finance 46, 879-903.

Mello, A., Parsons, J., 1998. Going public and the ownership structure of the firm. Journal of Financial Economics 49, 79-109.

Michaely, R., Shaw, W., 1995. Does the choice of auditor convey quality in an initial public offering? Financial Management 24, 15-30.

Mitchell, M. Mulherin J., 1996. The impact of industry shocks on takeover and restructuring activity. Journal of Financial Economics 41, 193-229.

Nenova, T., 2003. The value of corporate voting rights and control: a cross-country analysis. Journal of Financial Economics 69, 325–351.

Ritter J., 1984. The hot issue market of 1980. Journal of Business 57, 215-240.

Ritter, J., 1991. The long-run performance of initial public offerings, Journal of Finance 46, 3-27.

Rock, K., 1986. Why new issues are underpriced. Journal of Financial Economics 15, 187-212.

Roll, R., 1986. The hubris hypothesis of corporate takeovers. Journal of Business 59, 197-216.

Safieddine, A., Titman, S., 1999. Leverage and corporate performance: evidence from unsuccessful takeovers. Journal of Finance 54, 547-580.

Shleifer, A., Vishny, R., 1989. Management entrenchment : The case of manager-specific investments. Journal of Financial Economics 25, 123-139.

Smart, S., Zutter, C., 2003. Control as a motivation for underpricing: a comparison of dual and single-class IPOs. Journal of Financial Economics 69, 85-110.

Stoughton, N., Zechner, J., 1998. IPO-mechanisms, monitoring and ownership structure. Journal of Financial Economics 49, 45-77.

Stulz, R., 1988. Managerial control of voting rights. Financing policies and the market for corporate control. Journal of Financial Economics 20, 25-54.

Tinic, S., 1988. Anatomy of initial public offerings of common stock. Journal of Finance 43, 789-822.

Welch, I., 1992. Sequential sales, learning and cascades. Journal of Finance 47, 695-732.

Zingales, L., 1995. Insider ownership and the decision to go public. Review of Economic Studies 62, 425-448.

## Table 1 - Average International Sample IPO Underpricing

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. Table 1 lists the number of sample IPOs as well as the average IPO underpricing by listing country.

| *Country* | *IPOs* | *Underpricing* |
|---|---|---|
| Australia | 402 | 22.54% |
| Austria | 15 | 21.04% |
| Canada | 6 | 23.39% |
| Denmark | 10 | 14.33% |
| Finland | 15 | 19.45% |
| France | 222 | 14.13% |
| Germany | 171 | 40.54% |
| Hong Kong | 380 | 17.59% |
| Indonesia | 45 | 43.18% |
| Italy | 67 | 9.34% |
| Japan | 771 | 50.65% |
| Malaysia | 233 | 42.30% |
| Norway | 17 | 5.34% |
| New Zealand | 27 | 15.60% |
| Philippines | 18 | 14.05% |
| Singapore | 251 | 21.92% |
| S. Korea | 232 | 70.23% |
| Spain | 10 | 12.08% |
| Sweden | 29 | 5.80% |
| Switzerland | 25 | 12.01% |
| Thailand | 94 | 26.51% |
| Taiwan | 333 | 1.90% |
| UK | 372 | 26.40% |
| US | 953 | 30.26% |
| All IPOs | 4698 | 30.46% |

## Table 2 - Description of International Governance Proxies

The following table details the variables developed outside of this study and utilized as proxies for governance in the analysis presented here. The author thanks to LaPorta, Lopez-de-Silanes, Shleifer and Vishny for providing access to their variables through the authors' websites.

| Variable | Description | Predicted Relation with Underpricing |
|---|---|---|
| Accounting standards (account) | "Index created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items. These items fall into seven categories (general information, income statements, balance sheets, funds flow statement, accounting standards, stock data, and special items). A minimum of three companies in each country were studied. The companies represent a cross section of various industry groups; industrial companies represented 70 percent, and financial companies the remaining 30 percent." LaPorta et al. (1998) derived from International accounting and auditing trends, Center for International Financial Analysis and Research. | Positive |
| Anti-director rights (nant_dir) | "An index of anti-director rights is formed by adding one when (1) the country allows shareholders to mail their proxy vote; (2) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (3) cumulative voting or proportional representation of minorities on the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10%; or (6) when shareholders have preemptive rights that can only be waived by a shareholders' meeting. The range for the index ranges from zero to six" LaPorta et al. (1998). | Positive |
| CEO turnover (ceo_turnover) | Aggregate CEO turnover is constructed by country for the period 1993-1998 using a CEO turnover database provided by Hazem Daouk. The aggregate turnover number is then normalized by the number of publicly listed firms as of the year 1996. CEO turnover is analyzed from the country of origin perspective. | Positive |
| Creditor rights (cred_ind) | "Index aggregating creditor rights. The index is formed by adding 1 when: (1) the country imposes restrictions, such as creditors' consent or minimum dividends, to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) the debtor does not retain the administration of its property pending the resolution of the reorganization; (4) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm. The index ranges from 0 to 4." LaPorta et al. (1998) | Positive |

**Table 2 - continued**

| | | |
|---|---|---|
| Democracy score (democ) | "A source of the degree of democracy in a given country based on: (1) the competitiveness of political participation; (2) the openness and competitiveness of executive recruitment; and (3) the constraints on the chief executive. The variable ranges from zero to ten, where higher values equal a higher degree of institutionalized democracy. This variable is calculated as the average from 1960 through 2001." LaPorta et al. (2006) as reported in Jaggers and Marshall (2000). | Positive |
| Disclosure (disclose) | Disclosure requirements index consisting of the following components: (1) "the law prohibits selling securities that are going to be listed on the largest stock exchange of the country without delivering a prospectus to potential investors"; (2) "prospectus disclosure requirements regarding the compensation of directors and key officers"; (3) "disclosure requirements regarding the issuer's equity ownership structure"; (4) "prospectus disclosure requirements regarding the equity ownership of the issuer's shares by its directors and key officers"; (5) prospectus disclosure requirements regarding the issuer's contracts outside the ordinary course of business"; (6) "prospectus disclosure requirements regarding transactions between the issuer and its directors, officers and/or large shareholders." LaPorta et al. (2006). | Positive – disclosure represents a proxy for governance<br><br>Negative – disclosure represents a proxy for issue uncertainty |
| Efficiency of judiciary (eff_jud) | "Assessment of the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms" produced by the country risk rating agency International Country Risk (ICR). It may be "taken to represent investors' assessment of conditions in the country in question." Average between 1980 and 1983. Scale from 0 to 10, with lower scores representing lower efficiency levels." LaPorta et al. (2006) derived from International Country Risk Guide (Political Risk Services (1996)). | Positive |
| M&A activity (ma_deals) | Corporate control activity is measured for each country and year in the sample by retrieving the number of completed mergers and acquisitions from Thomson Financial's SDC Platinum Mergers and Acquisitions Database. This number is normalized by the number of publicly listed firms as of the year 2000. The M&A control variable is measured from the country of origin perspective. | Positive |
| Property rights (f_prop97) | " A rating of property rights in each country (on a scale from 1 to 5) in year 1997. The more protection private property receives, the higher the score. The score is based, broadly, on the degree of legal protection of private property, the extent to which the government protects and enforces laws that protect private property, the probability that the government will expropriate private property, and the country's legal protection to private property." LaPorta et al. (2006) as reported in Index of Economic Freedom (1997). | Positive |

**Table 2 - continued**

| | | |
|---|---|---|
| Public enforcement (publ_enf) | Public enforcement index consisting of the following components: (1) appointment, tenure and focus characteristics of the supervisor (where supervisor is the individual or agency with primary oversight of a country's main stock exchange); (2) authority and power of supervisor to make rules related to offerings and listings; (3) investigative powers of the supervisor; (4) ability of supervisor to order issuer, distributor and accountant to take actions in the event of a defective prospectus; (5) criminal sanctions available to issuers, distributors and accounts when financial statements are deemed deficient. LaPorta et al. (2006) | Positive |
| Rule of law (rulelaw_2000) | "Rule of law measures the extent to which agents have confidence in and abide by the rules of society in year 2000. These include perceptions of the incidence of both violent and non-violent crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts." LaPorta et al. (2006). Data source is Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi, 2003. | Positive |

## Table 3 - International Variable Summary Statistics

The following table lists the values for the governance proxies and average values for the control variables utilized in the empirical analysis by country. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. The data for the governance proxies included in panel A have been provided by LaPorta, Lopez-de-Silanes, Shleifer and Vishny through the authors' websites with the exception of the corporate control and CEO turnover proxies which were developed for the purposes of this study. Panel B illustrates the mean values for the control variables utilized in this study by country. The cross sectional mean and standard deviation for each variable are presented in the final rows.

## Table 3 Panel A – Country Level Governance Proxies

| Country | IPOs | account | ceo_turnover | cred_ind | democ | disclose | eff_jud | f_prop97 | ma_deals | nant_dir | publ_enf | rule_law |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 402 | 75 | 0.09 | 1 | 10.00 | 0.75 | 10.00 | 5 | 0.20 | 4 | 0.90 | 10.00 |
| Austria | 15 | 54 | 0.30 | 3 | 10.00 | 0.25 | 9.50 | 5 | 0.13 | 2 | 0.17 | 10.00 |
| Canada | 6 | 74 | 0.15 | 1 | 10.00 | 0.92 | 9.25 | 5 | 0.12 | 5 | 0.80 | 10.00 |
| Denmark | 10 | 62 | 0.24 | 3 | 10.00 | 0.58 | 10.00 | 5 | 0.11 | 2 | 0.37 | 10.00 |
| Finland | 15 | 77 | 0.85 | 1 | 10.00 | 0.50 | 10.00 | 5 | 0.14 | 3 | 0.32 | 10.00 |
| France | 222 | 69 | 0.35 | 0 | 7.95 | 0.75 | 8.00 | 4 | 0.17 | 3 | 0.77 | 8.98 |
| Germany | 171 | 62 | 0.43 | 3 | 10.00 | 0.42 | 9.00 | 5 | 0.11 | 1 | 0.22 | 9.23 |
| Hong Kong | 380 | 69 | 0.05 | 4 |  | 0.92 | 10.00 | 5 | 0.15 | 5 | 0.87 | 8.22 |
| Indonesia | 45 |  |  | 4 | 0.57 | 0.50 | 2.50 | 3 | 0.07 | 2 | 0.62 | 3.98 |
| Italy | 67 | 62 | 0.86 | 2 | 10.00 | 0.67 | 6.75 | 4 | 0.21 | 1 | 0.48 | 8.33 |
| Japan | 771 | 65 | 0.45 | 2 | 10.00 | 0.75 | 10.00 | 5 | 0.12 | 4 | 0.00 | 8.98 |
| Malaysia | 233 | 76 | 0.07 | 4 | 5.81 | 0.92 | 9.00 | 4 | 0.06 | 4 | 0.77 | 6.78 |
| New Zealand | 27 | 70 | 0.11 | 3 | 10.00 | 0.67 | 10.00 | 5 | 0.24 | 4 | 0.33 | 10.00 |
| Norway | 17 | 74 | 0.39 | 2 | 10.00 | 0.58 | 10.00 | 5 | 0.15 | 4 | 0.32 | 10.00 |
| Philippines | 18 | 65 |  | 0 | 4.54 | 0.83 | 4.75 | 4 | 0.07 | 3 | 0.83 | 2.73 |
| Singapore | 251 | 78 | 0.10 | 4 | 2.45 | 1.00 | 10.00 | 5 | 0.12 | 4 | 0.87 | 8.57 |
| South Korea | 232 | 62 | 0.06 | 3 |  | 0.75 | 6.00 | 5 | 0.07 | 2 | 0.25 | 5.35 |
| Spain | 10 | 64 | 0.27 | 2 | 6.05 | 0.50 | 6.25 | 4 | 0.03 | 4 | 0.33 | 7.80 |
| Sweden | 29 | 83 | 0.40 | 2 | 10.00 | 0.58 | 10.00 | 4 | 0.21 | 3 | 0.50 | 10.00 |
| Switzerland | 25 | 68 | 0.43 | 1 | 10.00 | 0.67 | 10.00 | 5 | 0.10 | 2 | 0.33 | 10.00 |
| Taiwan | 333 | 65 |  | 2 |  | 0.75 | 6.75 |  | 0.05 | 3 | 0.52 | 8.52 |
| Thailand | 94 | 64 |  | 3 | 3.82 | 0.92 | 3.25 | 5 | 0.12 | 2 | 0.72 | 6.25 |
| United Kingdom | 372 | 78 | 0.32 | 4 | 10.00 | 0.83 | 10.00 | 5 | 0.10 | 5 | 0.68 | 8.57 |
| United States | 953 | 71 | 0.17 | 1 | 10.00 | 1.00 | 10.00 | 5 | 0.11 | 5 | 0.90 | 10.00 |
| Cross Sectional Mean | 195.75 | 69.77 | 0.24 | 2.26 | 8.81 | 0.82 | 9.11 | 4.85 | 0.12 | 3.90 | 0.60 | 8.74 |
| Std Deviation | 247.31 | 5.33 | 0.18 | 1.28 | 2.44 | 0.15 | 1.66 | 0.39 | 0.06 | 1.14 | 0.34 | 1.34 |

## Table 3 Panel B – Control Variables

| Country | stturnover | integer | offer_size | ipo_activity | return3 |
|---|---|---|---|---|---|
| Australia | 0.70 | 0.23 | 15.65 | -2.65 | 0.04 |
| Austria | 0.28 | 0.60 | 17.19 | -2.93 | -0.01 |
| Canada | 0.63 | 0.17 | 15.29 | -7.51 | 0.05 |
| Denmark | 0.78 | 0.90 | 17.25 | -4.01 | 0.03 |
| Finland | 0.71 | 0.67 | 16.29 | -2.75 | 0.11 |
| France | 0.78 | 0.35 | 15.22 | -2.57 | 0.01 |
| Germany | 0.87 | 0.79 | 17.21 | -2.43 | 0.01 |
| Hong Kong | 0.49 | 0.13 | 16.38 | -2.30 | 0.00 |
| Indonesia | 1.85 | 1.00 | 15.81 | -3.35 | 0.07 |
| Italy | 1.01 | 0.55 | 17.63 | -2.76 | -0.02 |
| Japan | 0.79 | 1.00 | 16.32 | -2.78 | -0.02 |
| Malaysia | 0.32 | 0.07 | 14.97 | -2.70 | 0.03 |
| New Zealand | 0.39 | 0.41 | 16.37 | -2.57 | 0.03 |
| Norway | 0.98 | 0.94 | 17.58 | -3.54 | 0.06 |
| Philippines | 0.11 | 0.28 | 14.84 | -4.00 | 0.01 |
| Singapore | 0.54 | 0.00 | 15.79 | -2.01 | 0.01 |
| South Korea | 2.56 | 1.00 | 16.74 | -2.31 | 0.05 |
| Spain | 1.82 | 0.20 | 19.77 | -5.90 | -0.04 |
| Sweden | 1.11 | 0.97 | 17.62 | -3.40 | -0.06 |
| Switzerland | 0.76 | 1.00 | 18.27 | -3.40 | -0.02 |
| Taiwan | 2.07 | 0.87 | 15.64 | -2.01 | 0.03 |
| Thailand | 1.02 | 0.61 | 16.26 | -2.67 | 0.06 |
| United Kingdom | 0.97 | 0.88 | 20.76 | -3.04 | -0.01 |
| United States | 1.70 | 0.86 | 18.60 | -3.38 | 0.01 |
| Cross Sectional Mean | 1.12 | 0.65 | 16.98 | -2.76 | 0.01 |
| Std Deviation | 0.75 | 0.48 | 2.13 | 0.72 | 0.11 |

## Table 4 - International Variable Correlation Matrix

The sample consists of the country-level governance proxies and control variables for sample countries with at least one IPO occurring during the period 2000-2004. Many of the country-level corporate governance proxies were made available by LaPorta, Lopez-de-Silanes, Shleifer and Vishny.

| | account | ceo_turn | cred_ind | democ | disclose | eff_jud | f_prop97 | ma_deals | nant_dir | publ_enf | rule_law | stturnover | integer | offer_size | ipo_act | return3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **account** | 1.000 | | | | | | | | | | | | | | | |
| **ceo_turn** | -0.400 | 1.000 | | | | | | | | | | | | | | |
| **cred_ind** | 0.181 | -0.165 | 1.000 | | | | | | | | | | | | | |
| **democ** | -0.293 | 0.353 | -0.489 | 1.000 | | | | | | | | | | | | |
| **disclose** | 0.475 | -0.525 | -0.013 | -0.195 | 1.000 | | | | | | | | | | | |
| **eff_jud** | 0.492 | -0.004 | -0.070 | 0.522 | 0.291 | 1.000 | | | | | | | | | | |
| **f_prop97** | -0.099 | -0.119 | 0.010 | 0.429 | 0.192 | 0.457 | 1.000 | | | | | | | | | |
| **ma_deals** | 0.134 | 0.068 | -0.245 | 0.180 | -0.087 | 0.269 | 0.046 | 1.000 | | | | | | | | |
| **nant_dir** | 0.581 | -0.346 | -0.027 | 0.250 | 0.734 | 0.696 | 0.323 | 0.061 | 1.000 | | | | | | | |
| **publ_enf** | 0.651 | -0.647 | -0.078 | -0.247 | 0.629 | 0.122 | -0.104 | 0.118 | 0.448 | 1.000 | | | | | | |
| **rule_law** | 0.251 | 0.180 | -0.555 | 0.684 | 0.137 | 0.718 | 0.404 | 0.348 | 0.444 | 0.198 | 1.000 | | | | | |
| **stturnover** | -0.300 | -0.154 | -0.245 | 0.229 | 0.077 | -0.353 | 0.133 | -0.232 | -0.119 | -0.001 | -0.083 | 1.000 | | | | |
| **integer** | -0.349 | 0.374 | -0.206 | 0.448 | -0.164 | -0.086 | 0.208 | -0.188 | -0.070 | -0.429 | 0.065 | 0.383 | 1.000 | | | |
| **offer_size** | 0.199 | 0.117 | 0.035 | 0.334 | 0.191 | 0.223 | 0.270 | -0.070 | 0.316 | 0.132 | 0.213 | 0.182 | 0.298 | 1.000 | | |
| **ipo_act** | -0.126 | -0.085 | 0.278 | -0.266 | -0.158 | -0.174 | 0.026 | 0.161 | -0.280 | -0.110 | -0.229 | -0.137 | -0.169 | -0.283 | 1.000 | |
| **return3** | 0.002 | -0.136 | 0.004 | -0.094 | -0.015 | -0.137 | -0.035 | 0.036 | -0.083 | 0.068 | -0.093 | 0.034 | -0.049 | -0.016 | 0.066 | 1.000 |

## Table 5 - Univariate Examination of IPO Underpricing by Governance Proxy

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. The mean value for each governance proxy is presented in the second column, while average underpricing for sample events occurring in a country at or above the mean (column 3) and below the mean (column 4) is listed. The final column presents the p-value from a t-test examining the equality of the mean underpricing for above and below the mean sample events.

| | | Average Underpricing | | |
|---|---|---|---|---|
| **Governance measure** | **Mean Value** | **>= Mean** | **< Mean** | **p-value** |
| Accounting standards | 69.78 | 27.85% | 32.98% | 0.0098 |
| Antidirector rights | 3.90 | 32.02% | 26.28% | 0.0119 |
| CEO turnover | 0.24 | 33.57% | 28.38% | 0.0114 |
| Creditor rights | 2.26 | 33.01% | 28.84% | 0.0483 |
| Democracy score | 8.81 | 33.40% | 25.80% | 0.0001 |
| Disclosure | 0.82 | 27.56% | 33.26% | 0.0041 |
| Efficiency of judiciary | 9.11 | 30.81% | 29.67% | 0.6075 |
| M&A activity | 0.12 | 34.38% | 27.36% | 0.0005 |
| Property rights | 4.85 | 33.78% | 17.49% | 0.0000 |
| Public enforcement | 0.60 | 26.12% | 37.97% | 0.0000 |
| Rule of law | 8.74 | 33.38% | 26.64% | 0.0008 |

## Table 6 - IPO Underpricing as a Function of Single Governance Proxy

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. Control variables include a liquidity proxy, uncertainty proxy (integer offer price), the (log) size of the offering measured in U.S. dollars, the IPO issue climate measured as the (log) ratio of the number of IPOs in the issue year to the number of listed firms as of 2000 and the local market returns in the three months leading up to the month of the IPO. Governance proxies include those presented in prior tables. In addition, proxies for the corporate control climate and CEO turnover markets have been developed for the purposes of this study.

### Table 6 Panel A

| Governance Index | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| *Intercept* | 0.6286 | 0.7806 | 0.7026 | 1.1825 | 0.6214 | 0.9524 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Country liquidity* | 0.0372 | 0.0340 | 0.0420 | 0.1772 | 0.0542 | 0.0688 |
| | (0.0097) | (0.0478) | (0.0038) | (0.0000) | (0.0002) | (0.0003) |
| *Integer offer price* | 0.1361 | 0.1303 | 0.1440 | 0.1275 | 0.1529 | 0.1671 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Log offer size (US dollars)* | -0.0299 | -0.0284 | -0.0337 | -0.0472 | -0.0379 | -0.0405 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Log IPO activity* | 0.0075 | 0.0046 | 0.0160 | 0.1096 | -0.0267 | 0.0853 |
| | (0.6366) | (0.7739) | (0.3225) | (0.0000) | (0.1145) | (0.0000) |
| *Recent market returns* | 0.7331 | 0.7764 | 0.7528 | 0.9844 | 0.7537 | 0.9554 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Accounting standards* | | -0.0016 | | | | |
| | | (0.4884) | | | | |
| *Antidirectors index* | | | 0.0220 | | | |
| | | | (0.0232) | | | |
| *CEO turnover* | | | | 0.0473 | | |
| | | | | (0.0046) | | |
| *Creditors index* | | | | | 0.0484 | |
| | | | | | (0.0000) | |
| *Democracy score* | | | | | | 0.0098 |
| | | | | | | (0.0592) |
| *Adjusted R-squared* | 0.0364 | 0.0364 | 0.0373 | 0.0827 | 0.0422 | 0.0679 |
| *Observations* | 4698 | 4653 | 4698 | 4046 | 4698 | 3753 |

## Table 6 Panel B

| Governance Index | Model 7 | Model 8 | Model 9 | Model 10 | Model 11 | Model 12 |
|---|---|---|---|---|---|---|
| *Intercept* | 0.6729 | 0.5157 | 0.9404 | 0.7874 | 0.7498 | 0.7031 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Country liquidity* | 0.0352 | 0.0667 | 0.0608 | 0.1116 | 0.0567 | 0.0445 |
| | (0.0153) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0030) |
| *Integer offer price* | 0.1431 | 0.1424 | 0.1406 | 0.1737 | 0.0285 | 0.1365 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.2986) | (0.0000) |
| *Log offer size (US dollars)* | -0.0311 | -0.0363 | -0.0330 | -0.0439 | -0.0215 | -0.0325 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Log IPO activity* | 0.0095 | 0.0226 | -0.0018 | 0.0883 | -0.0143 | 0.0115 |
| | (0.5484) | (0.1586) | (0.9091) | (0.0000) | (0.3679) | (0.4691) |
| *Recent market returns* | 0.7394 | 0.7770 | 0.7303 | 0.8729 | 0.7694 | 0.7449 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Disclosure standards* | 0.0735 | | | | | |
| | (0.3107) | | | | | |
| *Efficiency of judiciary* | | 0.0341 | | | | |
| | | (0.0000) | | | | |
| *M&A activity* | | | 0.1092 | | | |
| | | | (0.0000) | | | |
| *Property rights index* | | | | 0.0558 | | |
| | | | | (0.0518) | | |
| *Public enforcement* | | | | | -0.2713 | |
| | | | | | 0.0000 | |
| *Rule of law* | | | | | | 0.0338 |
| | | | | | | (0.0890) |
| *Adjusted R-squared* | 0.0364 | 0.0412 | 0.0442 | 0.0723 | 0.0481 | 0.0368 |
| *Observations* | 4698 | 4698 | 4561 | 4365 | 4698 | 4698 |

## Table 7 - IPO Underpricing as a Function of Multiple Governance Proxies

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. Control variables include a liquidity proxy, uncertainty proxy (integer offer price), the (log) size of the offering measured in U.S. dollars, the IPO issue climate measured as the (log) ratio of the number of IPOs in the issue year to the number of listed firms as of 2000 and the local market returns in the three months leading up to the month of the IPO. Governance proxies include those presented in prior tables. In addition, proxies for the corporate control and CEO turnover markets have been developed for the purposes of this study.

| **Governance Index** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** | **Model 6** | **Model 7** | **Model 8** |
|---|---|---|---|---|---|---|---|---|
| *Intercept* | 0.6621 | 0.9497 | 0.8767 | 0.5185 | 0.9210 | 1.0282 | 0.6543 | 0.6671 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0516) |
| *Country liquidity* | 0.0902 | 0.2339 | 0.1127 | 0.1045 | 0.1213 | 0.1584 | 0.0933 | 0.2234 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Integer offer price* | 0.0326 | 0.0342 | 0.0787 | 0.0438 | 0.0410 | 0.0794 | 0.0346 | 0.0507 |
| | (0.2436) | (0.2912) | (0.0082) | (0.1219) | (0.1436) | (0.0078) | (0.2183) | (0.1275) |
| *Log offer size (US dollars)* | -0.0363 | -0.0528 | -0.0503 | -0.0382 | -0.0405 | -0.0451 | -0.0375 | -0.0445 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Log IPO activity* | -0.0226 | 0.0676 | 0.0515 | -0.0226 | -0.0462 | 0.0649 | -0.0233 | 0.0642 |
| | (0.1871) | (0.0010) | (0.0141) | (0.1887) | (0.0079) | (0.0008) | (0.1748) | (0.0200) |
| *Recent market returns* | 0.8543 | 1.1007 | 1.1155 | 0.8588 | 0.8448 | 0.9760 | 0.8566 | 1.2262 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Antidirectors index* | 0.0647 | 0.0698 | 0.0687 | 0.0378 | 0.0551 | 0.0615 | 0.0606 | 0.0488 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0130) | (0.0000) | (0.0000) | (0.0000) | (0.0144) |
| *Creditors index* | 0.0382 | 0.0391 | 0.0457 | 0.0428 | 0.0541 | 0.0298 | 0.0405 | 0.0432 |
| | (0.0000) | (0.0002) | (0.0000) | (0.0000) | (0.0000) | (0.0012) | (0.0000) | (0.0023) |
| *Public enforcement* | -0.3530 | -0.3331 | -0.2579 | -0.3159 | -0.3429 | -0.3178 | -0.3467 | -0.3398 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *CEO turnover* | | 0.0540 | | | | | | -0.1697 |
| | | (0.5972) | | | | | | (0.2136) |
| *Democracy score* | | | 0.0088 | | | | | 0.0017 |
| | | | (0.1928) | | | | | (0.8637) |
| *Efficiency of judiciary* | | | | 0.0245 | | | | 0.0016 |
| | | | | (0.0133) | | | | (0.9707) |
| *M&A activity* | | | | | 0.1382 | | | 0.0817 |
| | | | | | (0.0000) | | | (0.0269) |
| *Property rights index* | | | | | | -0.0177 | | 0.1802 |
| | | | | | | (0.5684) | | (0.0506) |
| *Rule of law* | | | | | | | 0.0170 | -0.2544 |
| | | | | | | | (0.4664) | (0.0006) |
| *Adjusted R-Squared* | 0.0591 | 0.1012 | 0.0897 | 0.0602 | 0.0702 | 0.0881 | 0.0591 | 0.1062 |
| *Observations* | 4698 | 4046 | 3753 | 4698 | 4561 | 4365 | 4698 | 3510 |

## Table 8 - Decomposition of Governance Indexes

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. Control variables include a liquidity proxy, uncertainty proxy (integer offer price), the (log) size of the offering measured in U.S. dollars, the IPO issue climate measured as the (log) ratio of the number of IPOs in the issue year to the number of listed firms as of 2000 and the local market returns in the three months leading up to the month of the IPO.

## Table 8 Panel A: Antidirector Rights Index Components

The components of the antidirector rights index include the following (LaPorta et al (1998)): (1) the country allows shareholders to mail their proxy vote; (2) shareholders are not required to deposit their shares prior to the general shareholders meeting, (3) cumulative voting or proportional representation of minorities on the board of directors is allowed, (4) an oppressed minorities mechanism is in place, (5) the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders meeting is less than or equal to ten percent and (6) when shareholders have preemptive rights that can only be waved by a shareholders meeting.

| **Antidirector Rights Components** | **Model** |
|---|---|
| *Intercept* | 0.4997 |
| | (0.0000) |
| *Country liquidity* | 0.1017 |
| | (0.0000) |
| *Integer offer price* | 0.1422 |
| | (0.0000) |
| *Offer size (US dollars)* | -0.0285 |
| | (0.0000) |
| *Log IPO activity* | 0.0052 |
| | (0.7794) |
| *Recent market returns* | 0.7653 |
| | (0.0000) |
| *Mail proxies* | -0.1520 |
| | (0.0000) |
| *Shares blocked before meeting* | 0.2864 |
| | (0.0000) |
| *Cumulative voting* | -0.1898 |
| | (0.0000) |
| *Oppressed minority mechanism* | 0.0335 |
| | (0.4389) |
| *< 10% votes to call meeting* | 0.0617 |
| | (0.3473) |
| *Preemptive rights* | -0.0924 |
| | (0.0032) |
| *Adjusted R-squared* | 0.0616 |
| *Observations* | 4698 |

## Table 8 Panel B: Creditor Rights Index Components

The components of the creditor rights index include the following (LaPorta et al (1998)): (1) the country imposes restrictions, such as creditors' consent or minimum dividends, to file for reorganization, (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay), (3) the debtor does not retain the administration of its property pending the resolution of the reorganization, and (4) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm.

| **Creditor Rights Components** | **Model** |
|---|---|
| *Intercept* | 0.5689 |
| | (0.0000) |
| *Country liquidity* | 0.1361 |
| | (0.0000) |
| *Integer offer price* | 0.0676 |
| | (0.0068) |
| *Offer size (US dollars)* | -0.0354 |
| | (0.0000) |
| *Log IPO activity* | 0.0050 |
| | (0.7812) |
| *Recent market activity* | 0.8752 |
| | (0.0000) |
| *Chapter 11 restrictions* | 0.0873 |
| | (0.0201) |
| *No automatic stay on assets* | -0.2513 |
| | (0.0000) |
| *Securited creditors first* | 0.1034 |
| | (0.0218) |
| *Management does not stay* | 0.3306 |
| | (0.0000) |
| *Adjusted R-squared* | 0.0786 |
| *Observations* | 4698 |

## Table 8 Panel C: Public Enforcement Index Components

The components of the public enforcement index include the following (LaPorta et al (2006)): (1) supervisor characteristics including whether a majority of members of main government agency in charge of supervision stock exchanges (supervisor) are appointed by the Executive branch of government, the supervisor cannot be dismissed at will of the appointing authority and separate agencies supervise commercial banks and stock exchanges, (2) rule-making power of the supervisor including the ability to issue regulations regarding primary offerings and listing rules without prior approval of governmental authorities, (3) investigative powers, including the power of the supervisor to command documents when investigating a violation of securities laws and to subpoena the testimony of witnesses when investigating a violation of securities laws and (4) criminal sanctions including the ability to hold issuers, distributors and accountants held liable for misleading prospectuses.

| **Public enforcement index components** | **Model** |
|---|---|
| *Intercept* | 0.9719 |
| | (0.0000) |
| *Country liquidity* | 0.1154 |
| | (0.0000) |
| *Integer offer price* | 0.0542 |
| | (0.0584) |
| *Log Offer size (US dollars)* | -0.0341 |
| | (0.0000) |
| *Log IPO activity* | 0.0199 |
| | (0.2588) |
| *Recent market returns* | 0.7778 |
| | (0.0000) |
| *Supervisor characteristics index* | -0.2326 |
| | (0.0000) |
| *Rule-making power index* | -0.3184 |
| | (0.0000) |
| *Investigative powers index* | 0.2352 |
| | (0.0006) |
| *Orders index* | 0.1682 |
| | (0.0076) |
| *Criminal index* | -0.2521 |
| | (0.0000) |
| *Adjusted R-squared* | 0.0779 |
| *Observations* | 4698 |

## Table 9 - Domestic Sample Descriptive Statistics

The sample is all U.S. IPO events with an offer price greater than or equal to $5 occurring during the period January 1990 through September 1998. The sample of control transactions is all public or private target firms, total deal value of over $1 million and a completed, pending or withdrawn status. Average underpricing represents the simple average over all IPOs. Industry classifications correspond to those utilized in Dyck and Zingales (2004) with the addition of a hi-tech classification using the hi-tech SIC codes identified in Ljungqvist and Wilhelm (2003).

| | | Agri | Mini | Cons | Manu | Tran | Whol | Reta | Fina | Serv | Hi Te |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1990 | IPO # | 0 | 9 | 3 | 17 | 4 | 3 | 5 | 3 | 8 | 15 |
| | Avg Underpricing | 0.00% | 3.01% | 3.82% | 10.46% | 20.38% | 13.27% | 6.92% | 1.78% | 10.34% | 16.07% |
| | M&A # | 6 | 87 | 16 | 446 | 141 | 63 | 62 | 289 | 174 | 187 |
| | Institutional | 0.00% | 1.65% | 1.29% | 1.26% | 1.10% | 0.57% | 1.78% | 0.84% | 1.71% | 1.14% |
| 1991 | IPO # | 0 | 0 | 2 | 53 | 7 | 11 | 29 | 28 | 60 | 42 |
| | Avg Underpricing | 0.00% | 0.00% | -3.13% | 12.39% | 6.25% | 7.74% | 8.18% | 8.18% | 9.87% | 15.92% |
| | M&A # | 6 | 81 | 14 | 362 | 124 | 52 | 61 | 289 | 168 | 164 |
| | Institutional | 0.00% | 0.00% | 0.50% | 1.23% | 0.96% | 1.27% | 1.41% | 1.01% | 1.16% | 1.20% |
| 1992 | IPO # | 0 | 5 | 5 | 108 | 13 | 14 | 41 | 38 | 47 | 55 |
| | Avg Underpricing | 0.00% | -1.18% | 7.53% | 9.40% | 5.64% | 8.94% | 9.60% | 7.11% | 10.06% | 15.87% |
| | M&A # | 15 | 62 | 15 | 335 | 152 | 61 | 70 | 391 | 236 | 177 |
| | Institutional | 0.00% | 1.87% | 0.89% | 1.39% | 2.45% | 1.57% | 1.51% | 1.26% | 1.40% | 1.31% |
| 1993 | IPO # | 1 | 14 | 6 | 120 | 34 | 18 | 33 | 33 | 35 | 79 |
| | Avg Underpricing | 2.08% | 3.46% | 1.49% | 9.20% | 9.51% | 9.30% | 21.58% | 7.45% | 12.95% | 17.14% |
| | M&A # | 12 | 73 | 17 | 435 | 164 | 101 | 93 | 604 | 291 | 212 |
| | Institutional | 2.59% | 2.29% | 1.51% | 1.44% | 1.23% | 1.25% | 1.83% | 1.53% | 1.17% | 1.36% |
| 1994 | IPO # | 0 | 8 | 2 | 95 | 16 | 14 | 20 | 16 | 46 | 64 |
| | Avg Underpricing | 0.00% | 6.03% | 3.79% | 6.31% | 7.99% | 12.60% | 12.52% | 4.94% | 7.13% | 16.72% |
| | M&A # | 8 | 84 | 29 | 569 | 220 | 123 | 150 | 711 | 375 | 310 |
| | Institutional | 0.00% | 0.70% | 2.41% | 1.67% | 1.39% | 1.94% | 1.67% | 1.53% | 1.53% | 1.49% |
| 1995 | IPO # | 1 | 4 | 1 | 76 | 15 | 11 | 15 | 24 | 44 | 114 |
| | Avg Underpricing | -1.67% | 4.42% | 9.13% | 9.40% | 9.97% | 15.53% | 13.60% | 16.95% | 18.19% | 35.49% |
| | M&A # | 8 | 72 | 20 | 679 | 250 | 125 | 138 | 681 | 399 | 386 |
| | Institutional | 0.00% | 0.54% | 4.94% | 1.39% | 1.18% | 1.77% | 1.43% | 1.56% | 1.50% | 1.18% |
| 1996 | IPO # | 0 | 13 | 3 | 109 | 20 | 15 | 27 | 25 | 90 | 121 |
| | Avg Underpricing | 0.00% | 8.47% | 10.83% | 9.93% | 11.08% | 18.44% | 17.81% | 13.79% | 16.23% | 25.23% |
| | M&A # | 11 | 115 | 31 | 717 | 282 | 160 | 174 | 793 | 547 | 493 |
| | Institutional | 0.00% | 1.95% | 1.16% | 1.56% | 1.35% | 1.56% | 1.77% | 1.55% | 1.51% | 1.40% |
| 1997 | IPO # | 0 | 8 | 4 | 65 | 16 | 7 | 18 | 24 | 48 | 86 |
| | Avg Underpricing | 0.00% | 8.14% | 14.99% | 8.25% | 15.42% | 19.78% | 10.55% | 12.44% | 13.78% | 20.58% |
| | M&A # | 9 | 134 | 40 | 772 | 302 | 195 | 205 | 865 | 654 | 544 |
| | Institutional | 0.00% | 1.93% | 1.44% | 1.58% | 1.38% | 1.77% | 1.56% | 1.47% | 1.47% | 1.16% |
| 1998 | IPO # | 0 | 0 | 3 | 8 | 8 | 6 | 6 | 15 | 17 | 23 |
| | Avg Underpricing | 0.00% | 0.00% | 7.21% | 18.29% | 12.27% | 13.71% | 11.80% | 5.09% | 16.20% | 22.00% |
| | M&A # | 11 | 67 | 45 | 511 | 185 | 115 | 105 | 719 | 387 | 426 |
| | Institutional | 0 | 0 | 2.07% | 0.88% | 0.84% | 1.21% | 1.33% | 1.61% | 1.24% | 1.39% |

## Table 10 - IPO Underpricing as a Function of Corporate Control Activity

The sample is all U.S. IPO events with an offer price greater than or equal to $5 occurring during the period January 1990 through September 1998. The sample of control transactions is all public or private target firms, total deal value of over $1 million and a completed, pending, or withdrawn status. Panels A utilizes a deal based proxy, while Panels B and C utilized value based proxies. Additional variables include the offer value (in millions), the rate spread on commercial and industrial loans over the Fed funds rate, a hot issue market dummy, the offer price revision, the positive offer price revision, the number of uses for proceeds listed in the prospectus, and the fraction of the total offer underwritten by the deal underwriter. Dummy variables are utilized to identify VC backed deals, equity carve outs, LBOs, Nasdaq listed firms, first tier audited deals, deals for firms with antitakeover provisions in place, deals for firms in states with strong antitakeover laws (Massachusetts, Pennsylvania and Ohio), and deals without anticipated dividends. Lagged market return represents the compounded daily return on the CRSP value weighted index over the 22 days preceding the IPO. All regressions include year and Fama and French industry dummy variables (not reported).

## Table 10 Panel A – M&A Deals normalized by Industry Firms

| | *Three Months* | *Six Months* | *Twelve Months* |
|---|---|---|---|
| *Intercept* | -7.1632 | -7.6971 | -9.2045 |
| | (0.6920) | (0.6704) | (0.6123) |
| *M&A activity (total M&A deals)* | 0.2723 | 0.1673 | 0.0791 |
| | (0.0227) | (0.0190) | (0.0696) |
| *LN offer value* | -1.1782 | -1.2112 | -1.2157 |
| | (0.0554) | (0.0488) | (0.0481) |
| *Capital market liquidity* | 0.0631 | 0.0649 | 0.0745 |
| | (0.5573) | (0.5461) | (0.4890) |
| *Hot issue dummy* | 1.7427 | 1.7710 | 1.8208 |
| | (0.0730) | (0.0683) | (0.0610) |
| *Offer-price revision* | 0.2255 | 0.2279 | 0.2239 |
| | (0.0000) | (0.0000) | (0.0000) |
| *Positive offer-price revision* | 0.9043 | 0.9018 | 0.9068 |
| | (0.0000) | (0.0000) | (0.0000) |
| *LN number of uses* | 0.5253 | 0.5365 | 0.5469 |
| | (0.6382) | (0.6311) | (0.6246) |
| *Underwriter market share* | 0.7781 | 0.7791 | 0.7817 |
| | (0.0000) | (0.0000) | (0.0000) |
| *Venture-backed* | 1.6940 | 1.6998 | 1.6826 |
| | (0.0459) | (0.0452) | (0.0475) |
| *Equity-carve-out* | -2.4457 | -2.4051 | -2.4040 |
| | (0.0994) | (0.1052) | (0.1055) |
| *Reverse-LBO* | -3.4326 | -3.3208 | -3.3301 |
| | (0.0761) | (0.0863) | (0.0856) |
| *Nasdaq-listed* | 1.2755 | 1.2811 | 1.2424 |
| | (0.3054) | (0.3033) | (0.3182) |
| *First-tier audited* | -2.5485 | -2.4601 | -2.4200 |
| | (0.1169) | (0.1300) | (0.1365) |
| *Anti-takeover provisions* | 0.0122 | 0.0350 | 0.0383 |
| | (0.9934) | (0.9810) | (0.9792) |
| *Anti-takeover state* | -0.3256 | -0.4095 | -0.4016 |
| | (0.8350) | (0.7933) | (0.7974) |
| *No anticipated dividends* | 1.2829 | 1.2401 | 1.2660 |
| | (0.3038) | (0.3198) | (0.3100) |
| *Lagged-market return* | 0.3291 | 0.3272 | 0.3234 |
| | (0.0122) | (0.0127) | (0.0138) |
| *Adjusted R-square* | 0.2933 | 0.2934 | 0.2927 |
| *Observations* | 2363 | 2363 | 2363 |

## Table 10 Panel B – M&A Value normalized by Industry Market Capitalization

| | *Three Months* | *Six Months* | *Twelve Months* |
|---|---|---|---|
| *Intercept* | -8.8422 | -8.0447 | -6.2567 |
| | (0.6254) | (0.6571) | (0.7298) |
| *M&A activity (total M&A deals)* | 0.4232 | 0.1817 | 0.0116 |
| | (0.0203) | (0.1129) | (0.8835) |
| *LN offer value* | -1.2012 | -1.1919 | -1.2064 |
| | (0.0507) | (0.0527) | (0.0500) |
| *Capital market liquidity* | 0.0766 | 0.0715 | 0.0654 |
| | (0.4762) | (0.5064) | (0.5431) |
| *Hot issue dummy* | 1.7699 | 1.8011 | 1.8371 |
| | (0.0685) | (0.0639) | (0.0589) |
| *Offer-price revision* | 0.2174 | 0.2205 | 0.2193 |
| | (0.0000) | (0.0000) | (0.0000) |
| *Positive offer-price revision* | 0.9137 | 0.9110 | 0.9131 |
| | (0.0000) | (0.0000) | (0.0000) |
| *LN number of uses* | 0.5980 | 0.5970 | 0.5654 |
| | (0.5925) | (0.5934) | (0.6132) |
| *Underwriter market share* | 0.7860 | 0.7849 | 0.7863 |
| | (0.0000) | (0.0000) | (0.0000) |
| *Venture-backed* | 1.6297 | 1.6828 | 1.6720 |
| | (0.0548) | (0.0475) | (0.0490) |
| *Equity-carve-out* | -2.4259 | -2.4443 | -2.4532 |
| | (0.1022) | (0.0998) | (0.0988) |
| *Reverse-LBO* | -3.3992 | -3.4342 | -3.4439 |
| | (0.0706) | (0.0761) | (0.0755) |
| *Nasdaq-listed* | 1.2041 | 1.1938 | 1.1885 |
| | (0.3330) | (0.3375) | (0.3399) |
| *First-tier audited* | -2.4736 | -2.3899 | -2.4232 |
| | (0.1279) | (0.1416) | (0.1363) |
| *Anti-takeover provisions* | -0.1115 | -0.0174 | 0.0121 |
| | (0.9395) | (0.9906) | (0.9934) |
| *Anti-takeover state* | -0.3285 | -0.3586 | -0.3291 |
| | (0.8335) | (0.8186) | (0.8335) |
| *No anticipated dividends* | 1.3916 | 1.3805 | 1.2817 |
| | (0.2646) | (0.2691) | (0.3047) |
| *Lagged-market return* | 0.3221 | 0.3250 | 0.3175 |
| | (0.0141) | (0.0134) | (0.0157) |
| *Adjusted R-square* | 0.2933 | 0.2924 | 0.2917 |
| *Observations* | 2363 | 2363 | 2363 |

## Table 10 Panel C – M&A Value normalized by Industry Asset Base

| | *Three Months* | *Six Months* | *Twelve Months* |
|---|---|---|---|
| *Intercept* | -7.0929 | -6.5605 | -6.1378 |
| | (0.6947) | (0.7168) | (0.7345) |
| *M&A activity (total M&A deals)* | 0.5037 | 0.2312 | 0.0020 |
| | (0.0096) | (0.0758) | (0.9823) |
| *LN offer value* | -1.2146 | -1.2072 | -1.2076 |
| | (0.0482) | (0.0497) | (0.0498) |
| *Capital market liquidity* | 0.0729 | 0.0685 | 0.0655 |
| | (0.4975) | (0.5242) | (0.5427) |
| *Hot issue dummy* | 1.7759 | 1.8027 | 1.8396 |
| | (0.0675) | (0.0636) | (0.0586) |
| *Offer-price revision* | 0.2158 | 0.2197 | 0.2191 |
| | (0.0000) | (0.0000) | (0.0000) |
| *Positive offer-price revision* | 0.9162 | 0.9119 | 0.9135 |
| | (0.0000) | (0.0000) | (0.0000) |
| *LN number of uses* | 0.5924 | 0.5926 | 0.5642 |
| | (0.5958) | (0.5960) | (0.6140) |
| *Underwriter market share* | 0.7851 | 0.7847 | 0.7865 |
| | (0.0000) | (0.0000) | (0.0000) |
| *Venture-backed* | 1.6314 | 1.6871 | 1.6720 |
| | (0.0545) | (0.0469) | (0.0491) |
| *Equity-carve-out* | -2.4174 | -2.4647 | -2.4542 |
| | (0.1033) | (0.0970) | (0.0986) |
| *Reverse-LBO* | -3.4894 | -3.4377 | -3.4485 |
| | (0.0713) | (0.0758) | (0.0751) |
| *Nasdaq-listed* | 1.2307 | 1.2271 | 1.1895 |
| | (0.3224) | (0.3242) | (0.3395) |
| *First-tier audited* | -2.4800 | -2.4145 | -2.4259 |
| | (0.1268) | (0.1374) | (0.1359) |
| *Anti-takeover provisions* | -0.1364 | -0.0433 | 0.0155 |
| | (0.9259) | (0.9765) | (0.9916) |
| *Anti-takeover state* | -0.3608 | -0.3554 | -0.3216 |
| | (0.8174) | (0.8202) | (0.8372) |
| *No anticipated dividends* | 1.3803 | 1.3835 | 1.2761 |
| | (0.2682) | (0.2678) | (0.3069) |
| *Lagged-market return* | 0.3218 | 0.3279 | 0.3174 |
| | (0.0142) | (0.0126) | (0.0157) |
| *Adjusted R-square* | 0.2937 | 0.2926 | 0.2917 |
| *Observations* | 2363 | 2363 | 2363 |

## Table 11 - Survival Probability as a Function of Pre-IPO M&A Activity

The sample is all U.S. IPO events with an offer price greater than or equal to $5 occurring during the period January 1990 through September 1998. The sample of control transactions is all public or private target firms, total deal value of over $1 million and a completed, pending, or withdrawn status. The first 5 columns of results utilize the deal based proxy for the prior 3 months while columns 6 through 10 measure pre-IPO corporate control activity using the value based proxy normalized by industry assets over the 6 months preceding the IPO. Additional variables include a dummy variable for deals backed by venture capitalists, the offer value (in millions), a sales-to-price multiplier calculated as the most recent fiscal-year-end net sales divided by the first-day market capitalization, a control for the investment bank reputation, a dummy variable for Nasdaq-listed firms, and dummies for firms with antitakeover devices in place and firms incorporated in a state with strong antitakeover laws (Massachusetts, Pennsylvania and Ohio). All regressions include Fama and French dummy variables (not reported).

| *Logistic: M&A* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Deals Prior 3 Months* | | | | | *Assets Prior 6 months* | | | | |
| | *One Year* | *Two Years* | *Three Years* | *Four Years* | *Five Years* | *One Year* | *Two Years* | *Three Years* | *Four Years* | *Five Years* |
| *Intercept* | -24.0766 | -3.0925 | -1.1638 | -1.0318 | -0.8779 | -22.4568 | -2.3105 | -0.7733 | -0.6826 | -0.3622 |
| | (0.9305) | (0.0021) | (0.0952) | (0.0943) | (0.1230) | (0.9372) | (0.0150) | (0.2472) | (0.2473) | (0.5042) |
| *M&A Activity* | 0.1473 | 0.0894 | 0.0499 | 0.0448 | 0.0671 | 0.1244 | 0.0652 | 0.0529 | 0.0452 | 0.0575 |
| | (0.0600) | (0.0042) | (0.0133) | (0.0154) | (0.0002) | (0.0174) | (0.0073) | (0.0045) | (0.0101) | (0.0022) |
| *Venture-backed* | -0.0312 | 0.0021 | 0.0580 | 0.0073 | -0.0272 | 0.0134 | -0.0081 | 0.0542 | 0.0036 | -0.0392 |
| | (0.9568) | (0.9922) | (0.7050) | (0.9566) | (0.8265) | (0.9816) | (0.9695) | (0.7235) | (0.9786) | (0.7515) |
| *LN offer value* | 0.0761 | 0.0293 | -0.0924 | -0.0379 | 0.0174 | -0.0441 | -0.0312 | -0.1160 | -0.0596 | -0.0143 |
| | (0.8673) | (0.8329) | (0.3702) | (0.6685) | (0.8321) | (0.9216) | (0.8183) | (0.2542) | (0.4955) | (0.8600) |
| *Sales to price multiplier* | -0.0842 | 0.0007 | -0.0343 | -0.0672 | -0.0546 | -0.1777 | -0.0120 | -0.0415 | -0.0729 | -0.0608 |
| | (0.8045) | (0.9931) | (0.5850) | (0.2422) | (0.2624) | (0.6295) | (0.8840) | (0.5216) | (0.2160) | (0.2228) |
| *Underwriter market share* | -12.0717 | -0.2707 | 2.1208 | 1.6297 | 0.1708 | -10.1025 | 0.1241 | 2.2944 | 1.8136 | 0.3987 |
| | (0.2398) | (0.9042) | (0.1899) | (0.2473) | (0.8974) | (0.2891) | (0.9558) | (0.1542) | (0.1955) | (0.7622) |
| *Nasdaq-listed* | -0.8993 | -0.3344 | -0.3130 | -0.1037 | 0.0635 | -0.9879 | -0.3721 | -0.3245 | -0.1124 | 0.0475 |
| | (0.2727) | (0.2548) | (0.1537) | (0.5863) | (0.7233) | (0.2162) | (0.2055) | (0.1392) | (0.5549) | (0.7910) |
| *Anti-takeover state* | 0.0841 | -1.1188 | -0.1376 | -0.2260 | -0.3023 | 0.1096 | -1.1057 | -0.1440 | -0.2359 | -0.3278 |
| | (0.9365) | (0.0628) | (0.6418) | (0.3742) | (0.2003) | (0.9175) | (0.0647) | (0.6257) | (0.3528) | (0.1642) |
| *Anti-takeover provisions* | 9.0365 | 0.5620 | 0.1392 | 0.0558 | 0.0515 | 8.8876 | 0.6176 | 0.1493 | 0.0661 | 0.0791 |
| | (0.9317) | (0.2406) | (0.6117) | (0.7990) | (0.7964) | (0.9275) | (0.1946) | (0.5860) | (0.7627) | (0.6914) |
| *Correct predictions* | 88.7% | 68.4% | 67.0% | 64.9% | 64.4% | 87.2% | 68.0% | 66.8% | 64.8% | 63.9% |
| *Number of observations* | 2162 | 2106 | 2001 | 1866 | 1788 | 2162 | 2106 | 2001 | 1866 | 1788 |
| *Aggregate number of mergers* | 15 | 133 | 290 | 440 | 584 | 15 | 133 | 290 | 440 | 584 |

## Table 12 - Post-IPO Institutional Ownership as a Function of IPO Underpricing

The sample is all U.S. IPO events with an offer price greater than or equal to $5 occurring during the period January 1990 through September 1998. The sample of control transactions is all public or private target firms, total deal value of over $1 million and a completed, pending, or withdrawn status. Post-IPO 13f institutional ownership is measured at the end of the quarter following the IPO and at subsequent 1, 2, 3, 4 and 5 year intervals. Additional variables include a dummy variable for deals backed by venture capitalists, the offer value (in millions), and the fraction of the total offer underwritten by the deal. All regressions include Fama-French Industry dummies (not reported).

### Table 12 Panel A – Average Institutional Ownership

| | *One Quarter* | *One Year* | *Two Years* | *Three Years* | *Four Years* | *Five Years* |
|---|---|---|---|---|---|---|
| *Intercept* | 2.4270 | 2.9129 | 2.7337 | 2.4053 | 2.1044 | 2.3004 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Initial return* | -0.0075 | -0.0057 | -0.0048 | -0.0047 | -0.0052 | -0.0050 |
| | (0.0000) | (0.0000) | (0.0003) | (0.0003) | (0.0008) | (0.0019) |
| *LN offer value* | -0.3257 | -0.3484 | -0.3293 | -0.3066 | -0.2719 | -0.3130 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| *Underwriter market share* | 0.0019 | -0.0073 | -0.0109 | -0.0114 | -0.0180 | -0.0181 |
| | (0.7590) | (0.1988) | (0.1014) | (0.0850) | (0.0206) | (0.0291) |
| *Venture-backed* | 0.1021 | 0.1105 | 0.1302 | 0.1127 | 0.0031 | -0.0287 |
| | (0.0594) | (0.0284) | (0.0279) | (0.0547) | (0.9647) | (0.7015) |
| *Adjusted R-square* | 0.0905 | 0.1236 | 0.1034 | 0.1020 | 0.0718 | 0.0940 |
| *Number of observations* | 2055 | 2029 | 1895 | 1689 | 1483 | 1261 |

## Table 12 Panel B – Maximum Institutional Ownership

| | *One Quarter* | *One Year* | *Two Years* | *Three Years* | *Four Years* | *Five Years* |
|---|---|---|---|---|---|---|
| *Intercept* | 2.5951 | 3.6253 | 3.3360 | 4.6446 | 3.5321 | 4.3872 |
| | (3.0000) | (0.0028) | (0.0065) | (0.0010) | (0.0482) | (0.0227) |
| *Initial return* | -0.0145 | -0.0119 | -0.0057 | -0.0077 | -0.0108 | -0.0088 |
| | (0.0270) | (0.0982) | (0.4381) | (0.3314) | (0.2723) | (0.3734) |
| *LN offer value* | 0.6564 | 0.8863 | 0.9736 | 0.7681 | 1.1471 | 0.8524 |
| | (0.0002) | (0.0000) | (0.0000) | (0.0004) | (0.0000) | (0.0028) |
| *Underwriter market share* | -0.0095 | 0.0212 | -0.0015 | 0.0095 | -0.0600 | -0.0097 |
| | (0.7729) | (0.5542) | (0.9668) | (0.8133) | (0.2243) | (0.8489) |
| *Venture-backed* | 0.7674 | 1.2635 | 1.6450 | 1.9747 | 1.5022 | 1.5690 |
| | (0.0084) | (0.0000) | (0.0000) | (0.0000) | (0.0007) | (0.0007) |
| *Adjusted R-square* | 0.0197 | 0.0310 | 0.0298 | 0.0346 | 0.0233 | 0.0170 |
| *Number of observations* | 2055 | 2029 | 1895 | 1689 | 1483 | 1261 |

## Table 13 - Relation between Survival and Post-IPO Institutional Blockholdings

The sample is all U.S. IPO events with an offer price greater than or equal to $5 occurring during the period January 1990 through September 1998. The sample of control transactions is all public or private target firms, total deal value of over $1 million and a completed, pending, or withdrawn status. The columns measure the probability of a firm remaining independent one through five years following the IPO with the institutional blockholding as the primary independent variable of interest. Additional control variables include a sales-to-price multiplier calculated as the most recent fiscal-year-end net sales divided by the first-day market capitalization, a dummy variable for Nasdaq-listed firms, and dummies for firms with antitakeover devices in place and firms incorporated in a state with strong antitakeover laws (Massachusetts, Pennsylvania and Ohio). All regressions include year and Fama and French industry dummy variables (not reported). Panel A reports the results for average institutional blockholdings while Panel B reports the results for the largest institutional blockholding.

### Table 13 Panel A – Average Institutional Blockholding

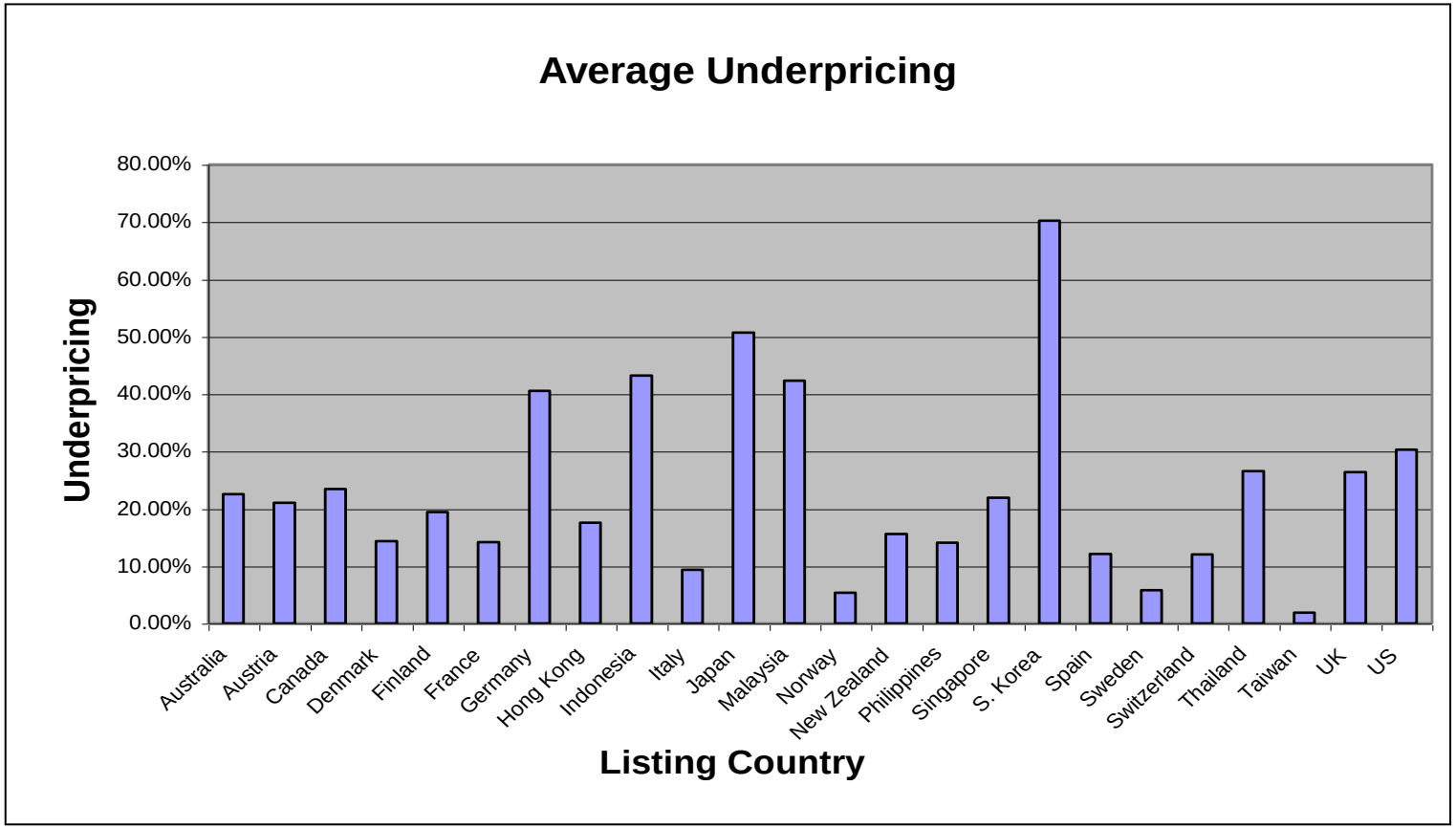
| *Logistic: Survivability* | | | | |
|---|---|---|---|---|
| | *Two Years* | *Three Years* | *Four Years* | *Five Years* |
| *Intercept* | -15.1880 | -3.5891 | -2.3162 | -0.9807 |
| | (0.9443) | (0.0021) | (0.0013) | (0.0816) |
| *Average institutional block* | 0.2515 | 0.2223 | 0.1760 | 0.1708 |
| | (0.0047) | (0.0018) | (0.0058) | (0.0049) |
| *Sales to price multiplier* | 0.0993 | 0.0405 | 0.0039 | 0.0193 |
| | (0.2907) | (0.5733) | (0.9509) | (0.7157) |
| *Nasdaq-listed* | -0.6079 | -0.4050 | -0.0933 | 0.0413 |
| | (0.0289) | (0.0491) | (0.5996) | (0.8033) |
| *Anti-takeover state* | -0.9228 | 0.0929 | -0.1745 | -0.2591 |
| | (0.1315) | (0.7663) | (0.5248) | (0.3054) |
| *Anti-takeover provisions* | 0.2818 | -0.2206 | -0.2802 | -0.2519 |
| | (0.6066) | (0.4686) | (0.2446) | (0.2461) |
| *Correct predictions* | 76.6% | 74.7% | 71.8% | 70.1% |
| *Number of observations* | 1846 | 1764 | 1669 | 1621 |
| *Aggregate number of mergers* | 111 | 257 | 404 | 549 |

## Table 13 Panel B – Largest Institutional Blockholding

| *Logistic: Survivability* | | | | |
|---|---|---|---|---|
| | *Two Years* | *Three Years* | *Four Years* | *Five Years* |
| *Intercept* | -15.2747 | -3.5982 | -2.2984 | -0.9829 |
| | (0.9420) | (0.0020) | (0.0014) | (0.0814) |
| *Largest insitutional block* | 0.0344 | 0.0208 | 0.0144 | 0.0160 |
| | (0.0243) | (0.0974) | (0.1851) | (0.0988) |
| *Sales to price multiplier* | 0.1039 | 0.0555 | 0.0170 | 0.0291 |
| | (0.2535) | (0.4174) | (0.7808) | (0.5757) |
| *Nasdaq-listed* | -0.5220 | -0.3127 | -0.0278 | 0.1078 |
| | (0.0568) | (0.1223) | (0.8740) | (0.5114) |
| *Anti-takeover state* | -0.9545 | 0.0881 | -0.1837 | -0.2642 |
| | (0.1194) | (0.7779) | (0.5034) | (0.2962) |
| *Anti-takeover provisions* | 0.2346 | -0.2460 | -0.2951 | -0.2694 |
| | (0.6665) | (0.4174) | (0.2194) | (0.2132) |
| *Correct predictions* | 75.8% | 74.0% | 71.4% | 69.8% |
| *Number of observations* | 1846 | 1764 | 1669 | 1621 |
| *Aggregate number of mergers* | 111 | 257 | 404 | 549 |

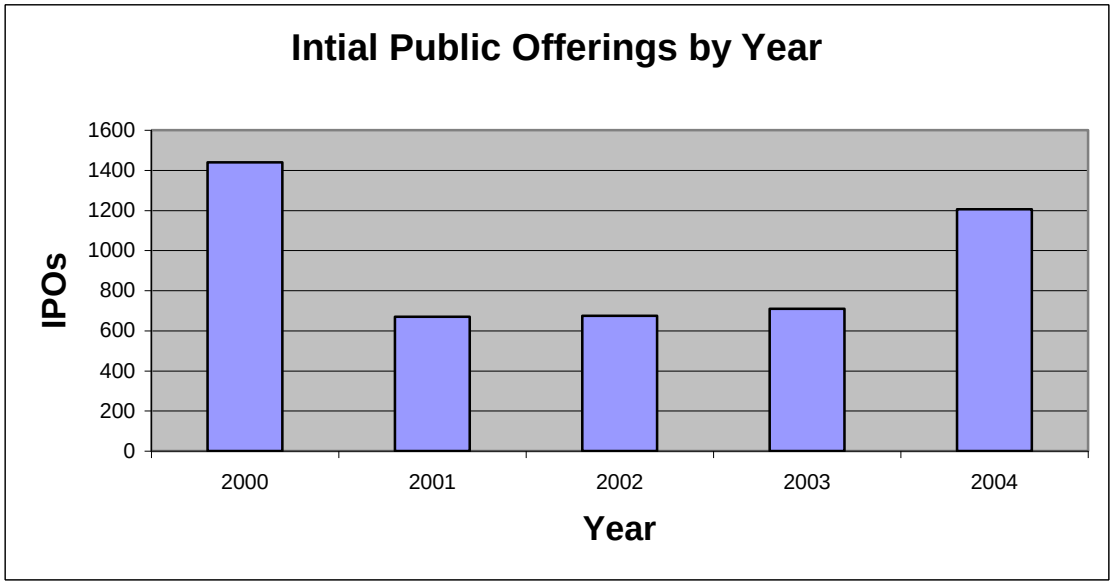
**Figure 1 - Average Underpricing by Country of Listing**

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. Simple average underpricing for each country is presented.



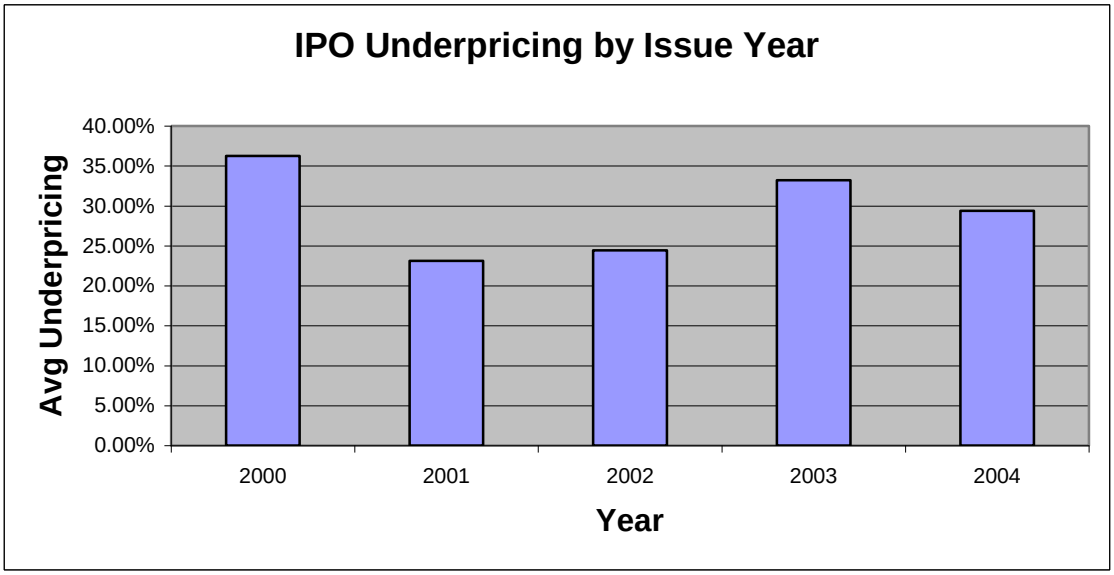
## Figure 2 - Initial Public Offerings by Issue Year

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. Figure 2 presents the total number of IPOs by Issue Year.



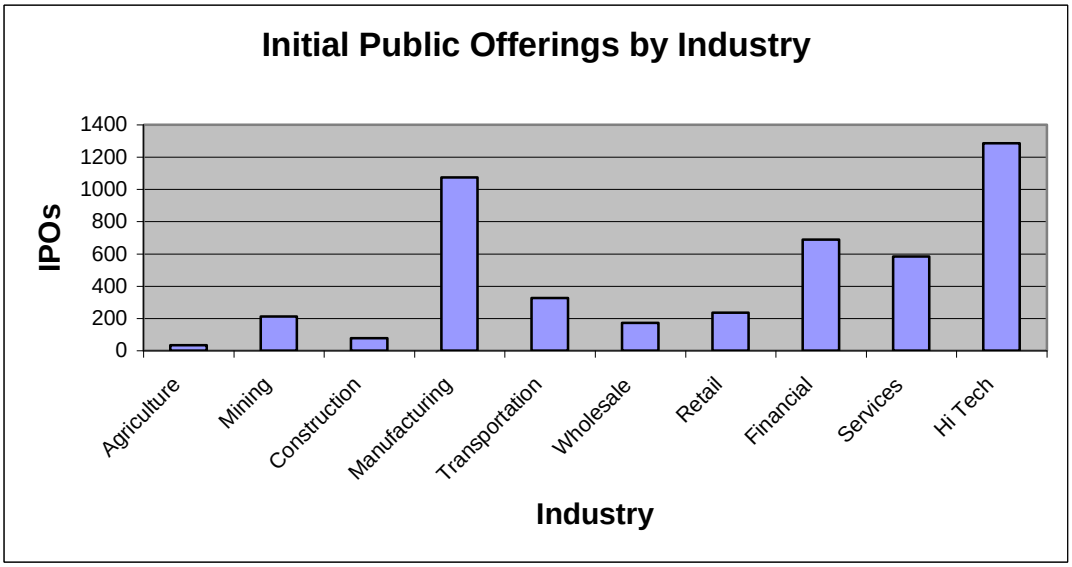
## Figure 3 - Initial Public Offering Underpricing by Issue Year

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. Figure 3 presents the average IPO underpricing by Issue Year.



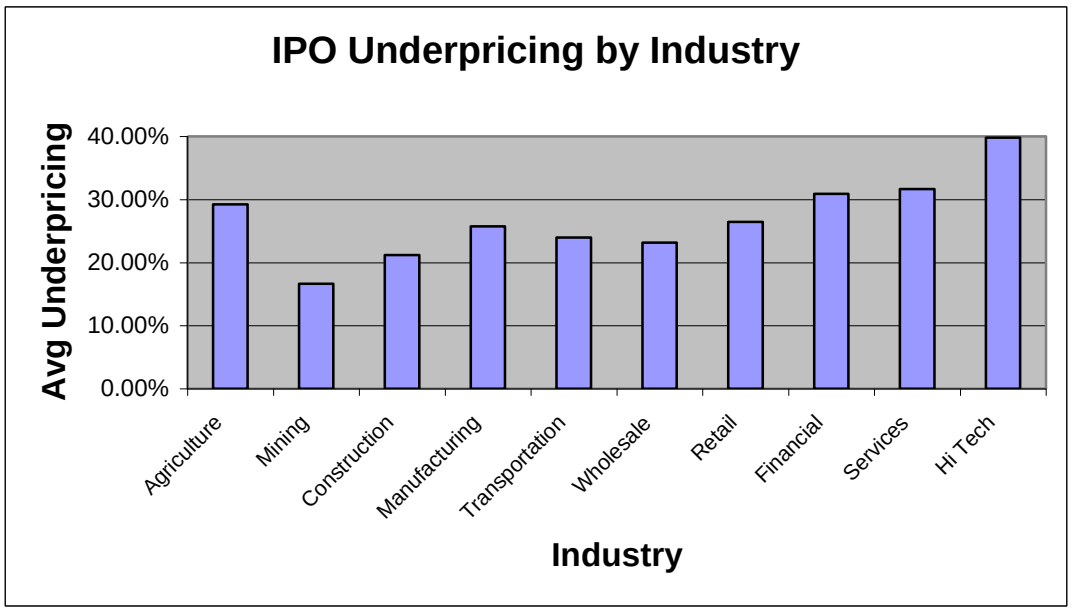
## Figure 4 - Initial Public Offerings by Industry

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. Figure 4 presents the total number of IPOs by Industry where industry definitions mimic those utilized in Table 1 of Dyck and Zingales (2004) with the addition of a hi-tech classification driven by the study of Ljungqvist and Wilhelm (2003).



## Figure 5 - Initial Public Offering Underpricing by Industry

The sample is all IPO events occurring during the period 2000-2004. The sample of countries is formed by the intersections of the LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) and Dyck and Zingales (2004) studies. Figure 5 presents average underpricing by Industry where industry definitions mimic those utilized in Table 1 of Dyck and Zingales (2004) with the addition of a hi-tech classification driven by the study of Ljungqvist and Wilhelm (2003).



## Figure 6 - Domestic IPO Underpricing and Recent Control Activity

The sample is all U.S. IPO events with an offer price greater than or equal to $5 occurring during the period January 1990 through September 1998. The sample of control transactions is all public or private target firms, total deal value of over $1 million and a completed, pending, or withdrawn status. Vertical bars illustrate average underpricing in the month of consideration and correspond to the left vertical axis. The square line represents the number of deals in the prior three months and corresponds to the right vertical axis. Trendline measures average IPO underpricing