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# Ownership Structure and Long-Run Performance of French IPO Firms
# Structure de propriété et performance à long terme des entreprises françaises introduites en bourse
# Estructura de propiedad y rendimiento a largo plazo de las ofertas públicas iniciales (OPIs) en el mercado francés

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Article abstract

Many studies have attempted to explain the long-term underperformance phenomenon of initial public offerings (IPOs). In this paper, we use the specificities of the French market to analyze whether the control-ownership wedge explains IPO long-run performance. Moreover, we investigate whether this relationship is driven by high-tech firms. Using data from a sample of 402 French high-tech and non-high-tech IPOs that went public during 1997-2011, we find that the separation of ownership and control rights of the largest shareholder is negatively associated with long-term performance of French IPOs. This finding indicates that IPOs with disproportional ownership structure underperform other firms in the one- to five-year period following the initial offering. Such separation increases the likelihood that controlling shareholders extract private benefits of control to the detriment of minority shareholders, leading to a low long-term performance. The empirical findings also show that our conclusions are not driven by high-tech firms.

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# Ownership Structure and Long-Run Performance of French IPO Firms

# Structure de propriété et performance à long terme des entreprises françaises introduites en bourse

# Estructura de propiedad y rendimiento a largo plazo de las ofertas públicas iniciales (OPIs) en el mercado francés

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**ABSTRACT**

Many studies have attempted to explain the long-term underperformance phenomenon of initial public offerings (IPOs). In this paper, we use the specificities of the French market to analyze whether the control-ownership wedge explains IPO long-run performance. Moreover, we investigate whether this relationship is driven by high-tech firms. Using data from a sample of 402 French high-tech and non-high-tech IPOs that went public during 1997-2011, we find that the separation of ownership and control rights of the largest shareholder is negatively associated with long-term performance of French IPOs. This finding indicates that IPOs with disproportional ownership structure underperform other firms in the one- to five-year period following the initial offering. Such separation increases the likelihood that controlling shareholders extract private benefits of control to the detriment of minority shareholders, leading to a low long-term performance. The empirical findings also show that our conclusions are not driven by high-tech firms.

**Keywords:** IPOs; high-tech firms; long-term performance; control-ownership divergence; controlling shareholders

**RÉSUMÉ**

Cette étude analyse l'effet de la différence entre les droits de contrôle et les droits aux flux financiers de l'actionnaire contrôlant sur la performance à long terme des introductions en bourse. En utilisant un échantillon de 402 entreprises françaises introduite en bourse entre 1997 et 2011, nous trouvons que cette différence est associée négativement à la performance à long terme des entreprises introduites en bourse en France. Ce résultat indique que les entreprises présentant une séparation entre les droits de contrôle et les droits de propriété sont moins performantes que les autres sur un horizon allant de un à cinq ans suivant l'offre initiale d'introduction. Une telle séparation augmente la probabilité que les actionnaires de contrôle tirent des avantages privés du contrôle au détriment des actionnaires minoritaires, entraînant une faible performance à long terme. Les résultats empiriques montrent également que les conclusions ne sont pas causes par les entreprises de haute technologie.

**Mots-Clés :** Introduction en bourse; entreprises de haute technologie; performance à long terme; séparation contrôle-propriété; actionnaire contrôlant

**RESUMEN**

Esta investigación analiza como la diferencia entre control y propiedad de un accionista mayoritario puede explicar el rendimiento a largo plazo de las OPIs. Para ello, disponemos de una muestra de 402 OPIs francesas realizadas en el periodo 1997-2011. La evidencia obtenida indica que la separación de los derechos de propiedad y control del accionista mayoritario se asocia negativamente con el rendimiento a largo plazo de las OPIs francesas. Este estudio permite extraer que las OPIs francesas con una estructura de propiedad desproporcionada tienen un rendimiento inferior al de otras empresas en el período de uno a cinco años después de la oferta inicial. Dicha separación aumenta la probabilidad de que los accionistas mayoritarios obtengan beneficios privados de dicho control en detrimento de los accionistas minoritarios, lo que lleva a un bajo rendimiento a largo plazo. Los resultados empíricos también revelan que nuestras conclusiones no derivan únicamente de empresas de alta tecnología.

**Palabras Clave:** OPIs; empresas de alta tecnología; rendimiento a largo plazo; divergencia control-propiedad; accionistas

The interest of academics and practitioners in understanding the performance of initial public offerings (IPOs) has grown over the past two decades. Past research, mainly on the US market, attempts to explain the long-run performance phenomenon, and reports an important underperformance of IPO stocks over up to a five-year period after going public (Ritter, 1991; Loughran and Ritter, 1995). Despite growing empirical evidence addressing this topic in many countries outside the US, most studies still focus on the US market. Furthermore, as yet, there have been no attempts to examine the impact of disproportionate ownership on IPO long-term performance in developed markets. The present study revisits the issue of IPO performance by focusing on the effect of ownership–control structure on post-issue long-term performance of French IPOs. More precisely, we augment empirical research on IPOs by investigating the effect of disproportionate ownership structure on long-term performance of French IPO firms and examining whether this relationship is driven by high-tech newly-listed firms.

The separation of control and cash flow rights in concentrated ownership entities shapes firm decisions. Stulz (1988) argues that the presence of large controlling shareholders comes at a cost. As ownership and control increase, the positive effect on firm value

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associated with CEO ownership starts to decrease compared to its negative effect related to his/her entrenchment behavior. The empirical findings of McConnell and Servaes (1990) consistently support the theoretical arguments of Stulz (1988). They show that the relationship between firm value and the fraction of common stock owned by corporate insiders decrease when insider ownership reaches 40% to 50%, corresponding to a situation where insiders maintain almost full control of the firm while owning a smaller fraction of firm ownership. In this respect, Shleifer and Vishny (1997) argue that it is likely that the interests of large controlling shareholders are at odds with those of other firm stakeholders. Nenova (2003), among others, show that superior-voting shares are always traded at a premium compared to inferior-voting shares, suggesting that minority shareholders anticipate the misuse of firm resources in the presence of high levels of control-ownership wedge. Boubaker (2007) shows that firm value decreases with control-ownership wedge for French-listed firms. Smart and Zutter (2003) show that dual-class IPOs experience lower initial returns and fewer control events during the post-IPO period than single-class IPOs, suggesting that controlling shareholders of these firms are more inclined to protect their private benefits of control. Smart *et al.* (2008) show that dual-class IPOs experience less CEO turnover and trade at lower prices compared to their single-class peers both at the IPO and for the long-run. Faulkender and Wang (2006) show that one extra dollar of cash contributes less to firm value as the divergence between insider voting rights and cash flow rights increases.

This study relates to two strands of the literature. First, it seeks to review and extend existing research that explains long-run performance of newly-listed firms around their IPOs. This literature attempts to provide several explanations for firm performance in the long-run (Ritter, 1991; Carter *et al.*, 1998; Chan *et al.*, 2004; Goergen *et al.*, 2007). Second, this paper relates to the literature on the effect of corporate governance on the outcome of IPOs (Ahmad-Zaluki *et al.*, 2011; Bell *et al.*, 2014; Judge *et al.*, 2015).

In contrast to the US context, the French context provides an interesting setting for studying the control-ownership structure for several reasons. First, the French corporate governance landscape exhibits high levels of ownership concentration, dominance of family-controlled firms and the presence of family members in management (Faccio and Lang, 2002). Second, the controlling shareholders of these firms can separate their cash flow rights from control rights using various mechanisms such as double voting shares, non-voting shares, and pyramid structure. Prior studies on the French context provide evidence that mechanisms separating control rights from cash-flow rights are commonplace in France. For instance, Boubaker and Labégorre (2008) show that French-listed firms mainly use double voting shares and pyramid structures as control-enhancing devices and that the latter ensures a larger discrepancy between ownership and control. Boubaker and Labégorre (2009) document the importance of families at the helm of French firms who very often maintain control while holding an incommensurately small fraction of cash-flow rights. These results are consistent with those of Barontini and Caprio (2006), who show that families are frequent users of control-enhancing mechanisms in Europe. Similar results have been reached by Faccio and Lang (2002) for Western continental European countries.

Moreover, the French context features relatively low levels of minority shareholders protection, inefficient law enforcement rules (Roosenboom and Schramade, 2006), and relatively less developed capital markets (Dyck and Zingales, 2004). Thus, such separation increases the incentives of the controlling shareholders to extract private benefits of control at the expense of minority shareholders, which causes a conflicts of interest between large and minority shareholders (Bebchuk *et al.*, 2000). Unlike in the US and the UK where widely-held firms dominate the economic landscape, we focus on closely held firms which are the norm in France. Thus, the French context is perfectly suited to analyze how the agency conflict between large and minority shareholders affect the performance of IPO.

Hence, this study contributes to both the IPO and the corporate governance debates as it offers a new framework for examining the effect of ownership–control structure of IPO firms on their long-term performance. First, this study contributes to the IPO performance literature by offering a new explanation for the long-term underperformance of French IPOs. Second, it extends both the corporate finance and corporate governance literatures by focusing on the role of control-ownership structure in certifying IPO firms' quality and offering interesting empirical additional insights on the performance of IPOs in France, which is an attractive setting to study the IPO process[1].

Using a data set of 402 French IPOs issued between 1997 and 2011, we provide evidence that IPO long-term performance decreases with excess control rights of the controlling shareholders[2], but positively related to their ultimate cash flow rights. These findings are highly significant for up to five years after the offering and remain robust after using several proxies for long-run performance.

The remainder of the paper proceeds as follows. Section 2 briefly reviews the literature on IPO long-term performance and motivates the hypotheses. Section 3 describes the data and empirical model. Section 4 provides the methodology and reports the main results. Section 5 summarizes and concludes the paper.

## Literature review and hypotheses

### Long-term IPO performance

Numerous studies address the existence of a long-run underperformance anomaly of IPOs around the world and provide several possible explanations for this phenomenon. Ritter (1991) pioneers these studies on the US market and shows that IPO firms perform poorly in the long-run. Loughran and Ritter (1995) find that US IPO stocks underperform by 7% per year in the five years after going public. Brav and Gompers (1997) examine whether venture capitalists impact IPO long-run performance and report that venture-backed companies perform better than nonventure-backed IPOs during the five years after the issue. Carter *et al.* (1998) find evidence that more prestigious underwriters have a significant positive effect on the long-run performance of IPO stocks.

1. Academic research provides several possible explanations for the long-term underperformance phenomenon (e.g., Ritter, 1991; Louhghran and Ritter; 1995; Brav and Gompers, 1997). It remains however silent regarding the effect of control-ownership wedge of the large owner on IPO long-term underperformance.

2. Control-ownership wedge and excess control are used here interchangeably to refer to the separation of control rights and cash flow rights.

In the UK, Levis (1993) examines the long-run anomaly of a sample of 712 UK IPOs that went public between 1980 and 1988. Depending on the benchmark used, the author finds that UK offerings experience an underperformance of 8 to 23% over the three years after listing. Espenlaub *et al.* (1999) investigate the long-run performance of 249 UK IPOs issued between July 1992 and December 1995 and find that venture capital-backed IPOs better perform than other IPOs.

Prior studies on German IPOs show negative long-run abnormal stock returns. For instance, Ljungqvist (1997) finds an average buy-and-hold return of –12.1% three years after going public. Stehle *et al.* (2000) show that the three-year mean abnormal return of German IPO stocks ranges between 16.1% in the period 1960-1987 and –13.5% during the 1988-1997 period. Likewise, Bessler and Thies (2007) provide new evidence on the determinants of long-run performance of IPOs in Germany between 1977 and 1995. These authors report that IPO stocks have positive long-run abnormal performance for up to 15 months, followed by negative abnormal returns over a 36-month period.

The empirical literature on French IPOs is abundant but mainly focusing on factors affecting the first day initial return. Goergen *et al.* (2009) show that the underpricing at the French *Nouveau Marché* is due, among others, to the degree of riskiness of the issuing firms and that it is lower in the presence of lock-up agreements. Chahine and Filatotchev (2008) investigate the impact of venture capitalist affiliation to the lead underwriters on long-term performance of 230 French IPOs issued between 1996 and 2002. They show that IPOs backed by venture capitalists affiliated to more prestigious underwriters have higher performance compared to other newly-listed firms one-year after the IPO date. Bouzouita *et al.* (2015) shows that initial underpricing lowers the costs related to information asymmetry and illiquity for French IPOs listed on the secondary markets of the Euronext. This result is consistent with those in Sentis (2001) suggesting that underpricing is the result of information asymmetry between the newly-introduced firm and investors. Ben Aissia (2014) show that higher levels of idiosyncratic skewness, turnover and momentum characterize French IPOs with high underpricing. More recently, Ben Aissia and Hellara (2019) find that industry and macroeconomic conditions affect the level of the first-day returns in French IPO market.

Few studies devote attention to exploring the reasons behind IPO long-run underperformance in the French stock market. Degeorge and Derrien (2001) suggest that there is no abnormal long-run performance in the French market. More recently, Boissin and Sentis (2014) analyze the effect of financial analyst recommendations on the long-run performance of French IPOs issued between 1991 and 2005. These authors find that abnormal long-run performance is higher for firms with high analyst coverage compared to those with low analyst coverage over a 3- to 5-year horizon.

## Hypotheses

### Cash flow ownership

Prior research on corporate governance identifies two types of agency conflicts, the one between managers and owners (Type I) and that between minority and controlling shareholders (Type II). Jensen and Meckling (1976) argue that lower ownership stakes held by firm managers gives them incentives to increase their consumption of perquisites. Thus, firms with higher levels of managerial ownership experience better performance (Morck *et al.*, (1988); Ducassy& Guyot (2017)). The existence of blockholders should have a positive impact on firm performance since these shareholders have larger resources and incentives to obtain information and monitor managers, which mitigates the agency costs (Shleifer and Vishny, 1997). In the same vein, Leland and Pyle (1977) claim that insider ownership serves as a "certification" device that ensures convergence of interests between insiders and outside shareholders, which manifests as better firm performance. Jain and Kini (1994) find evidence that managerial ownership is a significant and positive determinant of IPO operating performance. In other words, firms where the manager owns a substantial ownership stake do not show high long-run underperformance after going public.

Following the same reasoning, we should also expect long-term performance of IPOs to increase with the ultimate cash flow (UCF) rights of the largest controlling shareholders at the offering date. High UCF rights provide controlling shareholders with strong incentives to maximize their firms' future performance. Claessens *et al.* (2002) suggest that higher UCF rights play a significant role in aligning the interests of large and minority shareholders. Furthermore, they (p. 2741) point out that *"[i] nvestors with large ownership stakes … are able to collect information and oversee managers, and so can help overcome one of the principal–agent problems in the modern corporation–that of conflicts of interest between shareholders and managers*." Using a sample of 1,301 East Asian corporations, these authors find evidence that firm value increases with the UCF rights of the largest shareholder. Additionally, La Porta *et al.* (2002) observe that firms with higher cash-flow ownership by the largest shareholder have higher firm valuations in countries with high protection of minority shareholders. In the same vein, Lemmon and Lins (2003) show that firm value increases with the cash flow rights of the controlling owner. Consistently, Barontini and Caprio (2006) use a sample of 675 publicly traded firms in 11 Continental European countries and find that firm valuation and operating performance are positively and significantly related to the ultimate cash-flow rights of the controlling shareholder.

In light of these arguments, we draw the following hypothesis

**H1**: The long-run performance of an IPO firm increase with the ultimate cash-flow rights of the controlling shareholder.

### Separation of control rights and cash flow rights

Much of the early literature on the theory of firms is hinged on the assumption of widely dispersed ownership. This approach was propagated by Baumol (1959), Jensen and Meckling (1976), and Grossman and Hart (1980). For instance, Grossman and Hart (1980) argue that shareholders of firms that feature widely dispersed ownership have limited incentives to monitor management. Grossman and Hart (1988) and Harris and Raviv (1988) conclude that the departure from the one-share-one-vote rule could be socially non-optimal as it maximizes the benefit of control to the large shareholder and would generate additional costs for the firm, lowering shareholder value. In the same thread, Morck, Shleifer, and Vishny (1988) study the relationship

between managerial ownership and firm value. They document a negative relationship in the 5%-25% ownership range, suggesting an entrenchment effect caused by a situation of quasi-entire control of the company while holding an incommensurate small fraction of cash flow rights.

Bebchuk, Kraakman, and Triantis (2000) consider that control-enhancing mechanisms that separate control from cash flow rights aggravate the extent of the agency conflict between controlling and minority shareholders, leading to more potential consumption of private benefits that are only in part borne by the control party. The authors show that for given level of a control stake, agency costs rise nonlinearly in a sharply manner when the fraction of cash flow rights of the controlling shareholder decreases. Consistent with these findings, Masulis, Wang, and Xie, (2009) show that as the control-ownership wedge increases, CEOs benefit from higher compensation, make value-destroying acquisitions, the value of cash-holding is lower to minority shareholders, and capital expenditures do not fully increase shareholder value. Claessens *et al*. (2002) and Lemmon and Lins (2003) investigate the link between ownership-control structure and firm performance in Asian countries and find evidence that firm value decreases as control rights exceed cash-flow rights. Barontini and Caprio (2006) confirm this inverse relationship in Continental Europe. Similar conclusions were reached by Lemmon and Lins (2003), Lins (2003), Harvey, Lins, and Roper (2004), and Gompers, Ishii, and Metrick (2010). Shleifer and Vishny (1997) suggest that a concentrated ownership structure leads to a new agency conflict, as the interests of the controlling and minority shareholders are not perfectly aligned. La Porta *et al*. (1999) is the first study that identifies ultimate controlling shareholders by tracing the chain of ownership until the ultimate owners. The authors argue that the separation of ownership and control of the controlling shareholders increases their incentives to extract private benefits of control at the expense of minority shareholders.

Existing empirical research on corporate governance shows the separation of control and cash flow rights lowers firm value (e.g., Cronqvist and Nilsson, 2003;; Torres *et al*., 2017), lowers financial visibility (Boubaker and Labégorre, 2008), lowers stock liquidity (Attig *et al*., 2006), increases the cost of equity capital (Guedhami and Mishra, 2009; Lin *et al*., 2011), lowers demand for high-quality auditors (El Ghoul *et al*., 2015), leads to longer debt maturity (Ben Nasr, *et al*., 2015), and to more reliance on bank debt financing (Boubaker, *et al*., 2017). Based on these arguments, we hypothesize that separating control rights from cash flow rights would create an entrenchment behavior that eventually decreases long-term performance. The foregoing reasoning leads to the following hypothesis.

**H2**: The long-run performance of an IPO firm decreases with the separation of control rights and cash flow rights of the controlling shareholder.

However, the preceding reasoning does not necessarily mean that the separation of control rights and cash flow rights is detrimental to firm survival. Indeed, Derouiche *et al*. (2018) provide evidence that excess cash flow rights affect the survival rate of French IPOs. In particular, they show that the survival rate is positively influenced by the level of excess control since the latter provides incentives for owners to ensure the continuity of firm operations and maintain their private benefits for a longer period. Firm survival does not necessarily come with a better firm performance since its objective here is to consume private benefits of control at the expense of minority shareholders.

## Data and empirical model

This section describes our sample selection procedure, outlines the empirical model, defines control variables, and provides descriptive statistics of the main variables.

### Data

#### Sample selection

To define our sample period, we use the largest recent time period available at the beginning of this study. So we start in 1997[3] and end in 2011 since we need performance measure five years after (i.e. in 2016). So, your sample consists of 402 French IPOs from 1997 to 2011. Companies from the utility and financial sectors (SIC codes 4900-4999 and 6000-6999, respectively), foreign firms, offerings issued over-the-counter, and those moved to a different exchange are excluded from our sample. Ownership data and firm and issue characteristics at the offering (age, offering size, name of the lead underwriter, offer price, and industry classification) are gathered from the prospectuses of the offering firms, the French financial markets authority (Autorité des marchés financiers, AMF), NYSE-Euronext websites, and from the firms' websites. Financial data are collected from the Worldscope database.

#### Measures of ownership structure variables

Following Claessens *et al*., (2000) and Faccio and Lang (2002), the UCF rights are computed as the sum of the products of ownership stakes of the controlling shareholder along the different control chains. The ultimate control rights (UCO) are calculated as the sum of the weakest links (i.e., the lowest percentages) in the control chains. Hence, we start by defining the direct owners of our sample IPOs, the owners of these direct owners, the owners of their owners, and so on. Thus, we determine the complete ownership and control chains back to the ultimate owners. Ultimate owners are classified into four types, namely, family, government, widely held firms, and widely held financial institutions. Widely held firms are those without ultimate controlling owners at the 10% control threshold.

We consider the following stylized example to illustrate the computation of our ownership structure variables (i.e., ultimate cash flow and control rights)[4]. Let's consider a family that owns 30% of the direct cash flow rights and 40% of the direct control rights of firm A and 11% of the direct cash flow and control rights of firm B (that is, $O_{Family, A} = 30\%$; $V_{Family, A} = 40\%$; and $O_{Family, B} = V_{Family, B} = 11\%$). Firm A, in turn, holds 20% (30%) of the direct cash flow (control) rights of firm B (i.e., $O_{A, B} = 20\%$ and $V_{A, B} = 30\%$). As a result, the family is the ultimate

3. We do not start our sample before 1997 due to missing data on old operations.

4. UCO and UCF are two continuous variables. UCO is the proportion of ultimate control rights and could vary from 10% (control threshold) to 100% when the large shareholder owns full control of the firm.

owner of firm B. Its ultimate cash flow rights are the sum of the products of cash flow rights along the different control chains, that is, UCF = $(O_{Family, A} \times O_{A, B}) + O_{Family, B}$ = 17%. Its ultimate control rights equal the sum of the weakest links along the different control chains, that is, UCO = min $(V_{Family, A}; V_{A, B}) + V_{Family, B}$ = 41%. Using UCO (UCF) as the post-IPO control (cash flow) rights of the ultimate owner, we define our two measures of control-ownership wedge:

*Excess_control* is the difference between the control rights (*UCO*) and cash flow rights (*UCF*) of the ultimate owner, all divided by her control rights (*UCO*); *Excess_control = (UCO-UCF)/UCO* = (41% - 17%) / 41% =0,59

*Excess_ratio* is the ratio of the control rights to cash flow rights; *Excess_ ratio=UCO/UCF = 41% / 17% = 2.41.*[5]

### Empirical model

Using an ordinary least squares regression, we estimate the following empirical model to test our hypotheses:

$$\textit{Long-run performance} = a_0 + a_1\, \textit{Excess_control} + a_2\, \textit{UCF} + b\, \textit{Controls} + \textit{Year_dummies} + \textit{Industry_dummies} + u \quad (1)$$

where, *Long-run performance* measures are the buy-and-hold market-adjusted returns (BHRs) and the cumulative market-adjusted stock returns (CARs) accumulated for 12, 24, 36, and 60 months starting from one month after the IPO month;

*Excess control variables (-)*, is proxied using *Excess_control* and *Excess_ratio*.

Control variables are firm age (*LnAge*), firm size (*LnAsset*), offer size (*Ln_Size*), initial return (*Initial_Return*), offer price (*Offer_price*), and underwriter reputation (*Underwriter*). *LnAge* is the age of the firm (in years) at the offering date measured as the natural logarithm of the difference between the year of introduction and the year in which the company was founded. *LnAsset* proxies for firm size. It is the natural logarithm of the total assets at the offering date. *Ln_Size* is of the offering calculated as the natural logarithm of the gross proceeds. *Initial_Return* is the difference between the closing price at the first trading day and the offering price, all divided by the offering price. *Offer_price* is the offer price of the IPO. *Underwriter* is a dummy variable which is equal to one if the lead underwriter is among the 25% most active ones, and zero otherwise. We construct this ranking using IPO proceeds over the sample period. Appendix I reports definitions for all the variables used in our analysis.

#### Control variables

We use control variables identified in the literature as potential determinants of IPO long-term performance. Control variables include firm age, firm size, offering size, initial return, offer price, and underwriter reputation.

*Age* refers to the age of the IPO firm, in years, since establishment. Bhabra and Pettway (2003) and Ritter (1991) report that the best-performing firms are those with longer business histories, as they possess more experience, and so less ex ante risk. Therefore, we expect a positive relationship between firm age and long-run performance.

*Size* is often measured either through firm size (natural logarithm of total assets) or issue size (natural logarithm of gross proceeds). Ritter (1991) shows that large firms are likely to experience better long-run performance, as they are generally more diversified, have better access to capital markets and are less exposed to financial distress costs. Thus, we posit that firm size has a positive effect on IPO long-run performance.

*Initial return*. Carter and Dark (1990) find evidence that abnormal 18th month aftermarket returns are slightly lower for firms with higher initial returns compared to firms with lower initial returns. Ritter (1991) claims that industries with the lowest average initial return perform better than those with the highest average initial return. Firms with higher initial returns need to correct more regularly for their subsequent prices, which leads to lower long-run performance. Thus, we expect a negative relation between initial return and IPO long-run performance.

*Offer price*. According to the signaling theory, high-quality firms tend to choose a higher stock price at their IPO as a signal of their quality. In fact, they underprice at the time of offering in the hope of regaining this loss in the future when the true quality is revealed, and thus they present better long-run performance (Álvarez and González, 2005).

*Underwriter* is the underwriter's quality ranking. Prior studies find a positive relation between underwriter reputation and IPO long-run return. IPO firms handled by prestigious underwriters are expected to experience less severe long-term underperformance (Michaely and Shaw, 1994; Carter *et al*., 1998). In fact, a high-quality underwriter helps in reducing information asymmetry between issuers and investors, and thus it signals a high-quality issue.

#### Descriptive statistics

Table 1 provides descriptive statistics of the independent variables (Panel A) and long-term performance variables used in our model (Panel B). As shown in Panel A, the average excess control rights (*Excess_control*) of our sample firms is 9.97% (*Excess_ratio* is 1.15). The average largest shareholder holds 43.5% of firm cash flows. Regarding firms characteristics, IPO firms include young and firms with an average (median) age of about 14 years (9 years). In addition, they range from small-sized firms (5$^{th}$ percentile total assets equals € 7.5 million) to large-sized firms (95$^{th}$ percentile total assets equals € 675.90 million) with a mean (median) size of € 402.45 (€ 45.22) million. We also observe that 41.3% of the sample firms are underwritten by prestigious underwriters. Regarding long term performance measures, we note in Panel B that the mean (median) BHR falls from 0.154 (−0.173) in the first-year following the IPO to −0.050 (−0.296) five-year period after the listing, while the average CAR declines initially and then increases in the third and fifth years after the IPO to reach a peak of 0.228.

5. In a robustness test, we use an alternative computation method of UCO that considers owners with more than 50% of the control rights as fully controlling the company, thus transforming any UCO greater than 50% to 100%. Our results remain qualitatively unchanged when we consider this alternative definition of the variable. These results are available from the authors upon request.

Table 2 reports the mean and median values of post-IPO performance measures for the two-subsamples divided by whether the firm has positive excess control and allows comparing between the mean BHR (CAR) of firms with excess control and those without excess control. The mean BHR for IPOs with excess control declines over the five years after the IPO, whereas that for firms without excess control falls over the first two years then increases. The mean CAR for each subsample shows a slight decline during the first three years after going public, but then increases.

Table 3 displays pairwise correlations among the independent variables used in our regression. The results show that the absolute value of the correlation coefficients between the regressors used in the same specification range between 0.008 and 0.691, indicating that multicollinearity is not a serious issue in our study.[6] In addition, all variable inflation factor (VIF) coefficients are less than 2, and tolerance coefficients are greater than 0.5.

## Methodology and results

### Methodology

To investigate the long-run performance of the sample firms, we compute for each newly-listed firm, CAR and the buy-and-hold returns (BHR).

CAR is calculated as follows:

$$AR_{it} = r_{it} - r_{mt} \quad (2)$$

where $r_{it}$ is the monthly raw return of the stock, and $r_{mt}$ is the monthly raw return of the benchmark portfolio.

$$CAR_{it} = \sum_{i=1}^{t} AR_{it} \quad (3)$$

Following Ritter (1991), the buy-and-hold returns for a stock (BHR) are computed as follows:

$$BHR_t = \prod_{i=1}^{t}(1+r_{it}) - \prod_{i=1}^{t}(1+r_{mt}) \quad (4)$$

where $r_{it}$ is the monthly raw return of the stock, and $r_{mt}$ is the monthly raw return of the benchmark portfolio.

### Regression results

This section presents regression results that link the separation of cash flow rights and control rights to the post-IPO long-term performance. We estimate our regressions using standard ordinary least squares. In all regressions, the standard errors of the coefficient estimates are corrected according to White (1980). We estimate our model with 13-, 25-, 37-, and 61-month CARs (Table 4) and BHRs (Table 5) as dependent variables. Governance variables are *Excess_control*, *Excess_ratio*, and *UCF*. Control variables are *LnAge*, *LnAsset*, *Ln_Size, Offer_price, Initial_Return*, and *Underwriter*.

**TABLE 1**
**Summary statistics of variables**

| | 5th percentile | First quartile | Median | Mean | Third quartile | 95th percentile | Standard deviation |
|---|---|---|---|---|---|---|---|
| **Panel A: Independant variables** | | | | | | | |
| Excess_control (%) | −1.388 | 0.000 | 9.443 | 9.973 | 13.709 | 32.886 | 13.246 |
| Excess_ratio | 0.986 | 1.000 | 1.111 | 1.149 | 1.158 | 1.490 | 0.283 |
| UCF (%) | 13.35 | 30.23 | 42.8 | 43.472 | 54.99 | 79.55 | 18.721 |
| Age (Years) | 1.000 | 5.000 | 9.000 | 13.714 | 16.000 | 47.000 | 15.191 |
| Assets (€ millions) | 7.495 | 16.845 | 45.221 | 402.448 | 74.636 | 675.900 | 2719.403 |
| Size (€ millions) | 2.658 | 5.559 | 10.473 | 86.486 | 24.456 | 350.706 | 367.835 |
| Offer price (€ ) | 5.640 | 12.040 | 17.530 | 19.875 | 25.150 | 40.620 | 12.297 |
| Initial return | −0.137 | 0.000 | 0.000 | 1.159 | 0.104 | 9.603 | 8.124 |
| Underwriter | 0.000 | 0.000 | 0.000 | 0.413 | 1.000 | 1.000 | 0.493 |
| **Panel B: Long-term performance measures** | | | | | | | |
| BHR 13 months after IPO | −0.749 | −0.457 | −0.173 | 0.154 | 0.155 | 1.995 | 1.572 |
| BHR 25 months after IPO | −1.227 | −0.652 | −0.292 | −0.033 | 0.183 | 1.751 | 1.482 |
| BHR 37 months after IPO | −1.605 | −0.636 | −0.281 | −0.061 | 0.127 | 1.487 | 1.507 |
| BHR 61 months after IPO | −0.993 | −0.637 | −0.296 | −0.050 | 0.276 | 1.720 | 0.935 |
| CAR 13 months after IPO | −1.082 | −0.474 | −0.101 | −0.043 | 0.203 | 1.267 | 0.746 |
| CAR 25 months after IPO | −1.539 | −0.729 | −0.149 | −0.081 | 0.408 | 1.681 | 1.004 |
| CAR 37 months after IPO | −1.706 | −0.642 | −0.035 | −0.005 | 0.554 | 2.007 | 1.081 |
| CAR 61 months after IPO | −1.807 | −0.442 | 0.162 | 0.228 | 0.857 | 2.300 | 1.454 |

This table depicts the summary statistics of variables used in our model. Panel A reports descriptive statistics on the governance variables and firm characteristics used in our regressions. Panel B presents descriptive statistics on performance measures. The sample includes 402 French IPOs over the period 1997–2011. Appendix I reports definitions for all the variables used in our analysis.

6. Kennedy (2008) considers that multicollinearity may not be a problem when the correlation between independent variables is below 0.8. Table 3 shows that only one correlation coefficient is higher than 0.6; the one between *LnAsset* and *Ln_Size*. The results (unreported) remain qualitatively the same after running all regressions separately with only one of the two variables as a regressor.

As shown in Table 4, every one-percentage-point increase in excess control rights (*Excess_control*) results in a 0.59% (1.04%, 1.19%, and 1.19%) decrease in CARs 13 months (25 months, 37 months, and 61 months, respectively) post-IPO; this decrease is statistically significant at the conventional levels for all post-IPO periods. Likewise, as shown in Table 5, an increase of one percent in excess control rights (*Excess_control*) results in a significant decrease of 1.02% (0.64%, 0.94, and 0.81%) in BHRs 13 months (25 months, 37 months, and 61 months, respectively) after the IPO. Moreover, Table 4 shows that the coefficients of *Excess_ratio* are negative and statistically significant at the 10% level in specification 2 and at the 1% level in the remaining specifications. Again, in Table 5, we still find a negative and significant effect of the control-ownership wedge of the largest shareholder (*Excess_ratio*) on BHR. Consistent with our hypothesis, these findings suggest that firms with higher separation of control and cash flow rights underperform other IPOs in the long-run. Control-ownership wedge, thus, provides controlling shareholders with strong incentives to extract more private benefits of control to the detriment of firm performance.

As shown in Table 4, we find that the coefficients of the ultimate cash flow rights of the controlling shareholder (*UCF*) are positive and significant (at 5% and 10% levels) 25, 37, and 61 months post-IPO. Table 5 also reports a positive and significant relationship between cash flow rights and 25-month and 37-month BHR. These results support, to some extent, the prediction that IPO long-run performance increases with the cash flow rights of the ultimate owners. Controlling shareholders with high cash flow rights are more inclined to maximize their firms' future performance, since they own a large proportion of firm ownership. In other words, firms where owners hold large ownership stakes are less likely to suffer from agency problems, and thus from long-term underperformance.

With regard to control variables, the coefficient on firm age (*LnAge*) is statistically insignificant, implying that it makes no difference whether that IPO firms have long operating histories. The coefficients on *lnAsset* are positive and statistically significant, indicating that larger firms perform better in the long-term. However, the coefficient on *ln_Size* is negative and statistically significant, suggesting that firms with greater offering

**TABLE 2**
**IPO performance measures by excess control**

| | Firms without excess control | | Firms with excess control | |
|---|---|---|---|---|
| | Mean | Median | Mean | Median |
| BHR 13 months after IPO | 0.1775 | –0.3888 | 0.1421 | –0.2215 |
| BHR 25 months after IPO | –0.0967 | 0,1975 | 0.0024 | –0.3450 |
| BHR 37 months after IPO | –0.0790 | –0.1949 | –0.0514 | –0.3639 |
| BHR 61 months after IPO | 0.0092 | –0.1204 | –0.0849 | –0.3587 |
| CAR 13 months after IPO | –0.0696 | –0.0255 | 0.0038 | –0.1291 |
| CAR 25 months after IPO | –0.0900 | –0.0687 | –0.0664 | –0.2041 |
| CAR 37 months after IPO | –0.0457 | 0.0346 | 0.0661 | –0.0947 |
| CAR 61 months after IPO | 0.1389 | 0.2433 | 0.3842 | 0.1300 |

This table presents the means and medians of post-IPO performance measures by subsample (firms without excess control and firms with excess control). The sample includes 402 French IPOs over the period 1997–2011. Appendix I reports the definitions for all the variables used in the analysis.

**TABLE 3**
**Pearson correlations**

| | Excess_ control | Excess_ ratio | UCF | LnAge | LnAssets | Ln_Size | Offer_price | Initial_ Return | Underwriter |
|---|---|---|---|---|---|---|---|---|---|
| Excess_control | 1.0000 | | | | | | | | |
| Excess_ratio | 0.9049 | 1.0000 | | | | | | | |
| UCF | –0.0817 | –0.0844 | 1.0000 | | | | | | |
| LnAge | 0.0168 | 0.0089 | 0.1473 | 1.0000 | | | | | |
| LnAssets | –0.0362 | –0.0083 | 0.2621 | 0.3571 | 1.0000 | | | | |
| Ln_Size | –0.0910 | –0.0458 | 0.2799 | 0.3705 | 0.6911 | 1.0000 | | | |
| Offer_price | 0.0977 | 0.0633 | –0.0017 | 0.1275 | 0.1731 | 0.1334 | 1.0000 | | |
| Initial_Return | 0.1100 | 0.0831 | 0.0087 | –0.0115 | –0.0191 | –0.0485 | 0.0727 | 1.0000 | |
| Underwriter | 0.0548 | 0.0757 | 0.0101 | 0.1441 | 0.2771 | 0.3861 | 0.1820 | 0.0252 | 1.0000 |

This table reports Pearson correlations between the independent variables used in our main regressions. The sample includes 402 French IPOs over the period 1997–2011. Appendix I reports definitions for all the variables used in our analysis.

size underperform in the long-run. Overall, the coefficient on *Offer_Price* is positively and statistically related to IPO long-term performance, suggesting that the offer price can serve as an indicator of the issue quality. This evidence is consistent with the view that low-priced IPOs are more likely to delist due to financial distress over the first five years post-IPO, and thus high-priced IPOs outperform low-priced ones (Fernando *et al*., 2004). In the same vein, the finding regarding *Initial_Return* suggests that there is a negative and statistically significant relationship between underpricing and long-run performance one year after the IPO. Underwriter reputation, *Underwriter*, is positively associated with the long-run performance. The relationship is statistically significant when the long-run performance is measured after 13, 25 and 37 months following the IPO for CARs and 13 months for BHARs. This result is consistent with the theory that IPOs with more prestigious underwriters perform better in the long-run (Carter *et al*., 1998).

## Robustness tests

To test the robustness of our results, we perform several additional tests. First, we use relative wealth ratios as a measure for long-run performance. Then, we conduct sensitivity tests using additional control variables, including another proxy for excess control and excluding all IPOs issued during the crisis years from the sample.

### Relative wealth ratios

To test the robustness of our main results, we use the relative wealth as a proxy for long-term performance. Following Loughran and Ritter (1995), we compute wealth relative ratios as the mean return of the IPO portfolio for a period (between $t$=1 and $t$=$T$, being alternatively 13, 25, 37, and 61 months) over the mean return of the respective benchmark in the same period. The wealth relative ratios are measured as follows

$$WR_T = \frac{\frac{1}{N}\sum_{i=1}^{N}\left(\prod_{i=1}^{T}\left(1+r_{it}\right)\right)}{\frac{1}{N}\sum_{i=1}^{N}\left(\prod_{i=1}^{T}\left(1+E\left(r_{it}\right)\right)\right)} \quad (5)$$

where, $r_{it}$ is market return on the security; $E(r_{it})$ is expected return, and $N$ is number of IPOs.

**TABLE 4**
**The impact of control-ownership structure on the post-IPO long-term performance (CARs)**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | CAR 13 month after IPO | | CAR 25 month after IPO | | CAR 37 month after IPO | | CAR 61 month after IPO | |
| Constant | 0.4124 | 0.4951 | 0.2819 | 0.7530 | 0.6452 | 1.1259* | 1.5203** | 2.0348** |
| | (1.1012) | (1.1584) | (0.5704) | (1.3298) | (1.1549) | (1.8130) | (2.2278) | (2.5763) |
| Excess_control | −0.5955* | | −1.0441*** | | −1.1877*** | | −1.1879*** | |
| | (−1.9343) | | (−2.8481) | | (−3.2031) | | (−2.6017) | |
| Excess_ratio | | −0.2712* | | −0.5710*** | | −0.6122*** | | −0.6415*** |
| | | (−1.7131) | | (−3.0964) | | (−3.5472) | | (−2.8378) |
| UCF | 0.1423 | 0.1650 | 0.5635** | 0.5439** | 0.5674** | 0.5584** | 0.6483** | 0.6266* |
| | (0.8112) | (0.9299) | (2.2569) | (2.1485) | (2.1321) | (2.0647) | (2.0201) | (1.9395) |
| LnAge | −0.0015 | −0.0023 | −0.0002 | −0.0007 | 0.0025 | 0.0018 | 0.0005 | −0.0002 |
| | (−0.6829) | (−0.9928) | (−0.0707) | (−0.2370) | (0.7330) | (0.5324) | (0.1312) | (−0.0470) |
| LnAsset | 0.0641** | 0.0565* | 0.0973** | 0.0923** | 0.1345*** | 0.1280*** | 0.0339 | 0.0303 |
| | (2.1773) | (1.9121) | (2.2406) | (2.0839) | (2.9387) | (2.7602) | (0.5976) | (0.5328) |
| Ln_Size | −0.0656* | −0.0472 | −0.0990** | −0.0895* | −0.1177** | −0.1056** | −0.0532 | −0.0429 |
| | (−1.9141) | (−1.4127) | (−2.0830) | (−1.8003) | (−2.3505) | (−2.0234) | (−0.8998) | (−0.7082) |
| Offer_price | 0.0056* | 0.0056* | 0.0096** | 0.0094** | 0.0032 | 0.0026 | 0.0032 | 0.0026 |
| | (1.9278) | (1.8837) | (2.1786) | (2.0122) | (0.6458) | (0.5092) | (0.5740) | (0.4459) |
| Initial_Return | −0.0087* | −0.0092** | 0.0074 | 0.0066 | −0.0024 | −0.0034 | −0.0066 | −0.0075 |
| | (−1.9199) | (−2.0474) | (0.6712) | (0.5981) | (−0.2089) | (−0.2920) | (−0.4750) | (−0.5437) |
| Underwriter | 0.1467* | 0.1498* | 0.1746 | 0.1792* | 0.2911** | 0.2964** | 0.1544 | 0.1585 |
| | (1.9050) | (1.3019) | (1.6240) | (1.6605) | (2.3010) | (2.3347) | (1.0348) | (1.0602) |
| Year dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Industry dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Observations | 402 | 402 | 402 | 402 | 402 | 402 | 402 | 402 |
| Adj. $R^2$ | 0.278 | 0.280 | 0.190 | 0.188 | 0.139 | 0.135 | 0.081 | 0.079 |

In this table, the dependent variable is market-based performance, measured as the CARs accumulated for 13, 25, 37 and 61 months after the IPO. The independent variables, measured at IPO year, include the degree of excess control rights (Excess_control), and (Excess_ratio) equal to control rights over ownership rights. the ultimately controlling shareholder's cash flow rights (UCF), Also included are (LnAge) is the age of the IPO at the offering (in years), (LnAsset) is the log of total assets, (Ln_Size) is the number of shares, multiplied by the offer price, (Initial_Return) is the percentage change between the offer price and the first closing price, and (Underwriter) is a dummy variable which is equal to one if the lead underwriter is among the 25% most active ones, and zero otherwise. We construct this ranking using IPO proceeds over the sample period. p-values are in parentheses; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

**TABLE 5**
**The impact of control-ownership structure on the post-IPO long-term performance (BHRs)**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | BHR 13 month after IPO | | BHR 25 month after IPO | | BHR 37 month after IPO | | BHR 61 month after IPO | |
| Constant | 1.0704 | 1.2260* | −0.2488 | 0.1079 | −0.0540 | 0.4340 | 1.3972*** | 1.7450*** |
| | (1.6269) | (1.6862) | (−0.4501) | (0.1762) | (−0.1046) | (0.7553) | (2.8446) | (3.1293) |
| Excess_control | −1.0213* | | −0.6439** | | −0.9355** | | −0.8098*** | |
| | (−1.8660) | | (−1.9735) | | (−2.5187) | | (−2.7577) | |
| Excess_ratio | | −0.5105** | | −0.4269*** | | −0.5576*** | | −0.4399*** |
| | | (−2.2036) | | (−2.6585) | | (−3.1897) | | (−3.1042) |
| UCF | −0.1474 | −0.1197 | 0.6983** | 0.6676** | 0.6884** | 0.6546** | 0.3200 | 0.3035 |
| | (−0.4448) | (−0.3549) | (2.3821) | (2.2256) | (2.3453) | (2.2536) | (1.3566) | (1.2736) |
| LnAge | −0.0037 | −0.0050 | 0.0011 | 0.0008 | 0.0069 | 0.0066 | 0.0055 | 0.0052 |
| | (−1.0430) | (−1.3809) | (0.3246) | (0.2356) | (1.3672) | (1.2946) | (1.6454) | (1.5172) |
| LnAsset | 0.0853* | 0.0743 | 0.1147** | 0.1108* | 0.2020*** | 0.2003*** | 0.1194** | 0.1210** |
| | (1.7464) | (1.4719) | (2.0946) | (1.9530) | (3.4943) | (3.4084) | (2.4569) | (2.4578) |
| Ln_Size | −0.1195* | −0.0874 | −0.0996 | −0.0924 | −0.1715*** | −0.1681*** | −0.1038* | −0.1024* |
| | (−1.9241) | (−1.3955) | (−1.6055) | (−1.3750) | (−2.8337) | (−2.6291) | (−1.9405) | (−1.8305) |
| Offer_price | 0.0081 | 0.0092* | 0.0131** | 0.0143** | 0.0061 | 0.0071 | 0.0086** | 0.0094** |
| | (1.5425) | (1.8434) | (2.3165) | (2.4575) | (1.0251) | (1.1372) | (2.1056) | (2.2418) |
| Initial_Return | −0.0129** | −0.0138** | −0.0034 | −0.0039 | −0.0056 | −0.0063 | −0.0017 | −0.0023 |
| | (−2.1651) | (−2.3165) | (−0.4081) | (−0.4677) | (−0.6593) | (−0.7460) | (−0.2791) | (−0.3801) |
| Underwriter | 0.2559* | 0.2573* | 0.0802 | 0.0818 | 0.2453 | 0.2461 | 0.1180 | 0.1155 |
| | (1.9337) | (1.9275) | (0.6028) | (0.6127) | (1.4782) | (1.4786) | (1.1759) | (1.1490) |
| year dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Industry dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Observations | 402 | 402 | 402 | 402 | 402 | 402 | 402 | 402 |
| Adj. $R^2$ | 0.228 | 0.238 | 0.077 | 0.083 | 0.051 | 0.052 | 0.104 | 0.104 |

In this table, the dependent variable is market-based performance, measured as the BHRs accumulated for 13, 25, 37 and 61 months after the IPO. The independent variables, measured at IPO year, include the degree of excess control rights (Excess_control), and (Excess_ratio) equal to control rights over ownership rights. the ultimately controlling shareholder's cash-flow rights (UCF), Also included are (LnAge) is the age of the IPO at the offering (in years), (LnAsset) is the log of total assets, (Ln_Size) is the number of shares, multiplied by the offer price, (Initial_Return) is the percentage change between the offer price and the first closing price, and (Underwriter) is a dummy variable which is equal to one if the lead underwriter is among the 25% most active ones, and zero otherwise. We construct this ranking using IPO proceeds over the sample period. p-values are in parentheses; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

We further re-estimate our regressions to examine the impact of ownership–control structure on the wealth relative ratios for the one-, two-, three-, and five-year periods post-IPO. The results are reported in Table 6. The coefficients of *Excess_control* and *Excess_ratio* remain negatively related to the long-term performance. This finding is consistent with H1, suggesting that separating ownership and control provides incentives to the controlling shareholders to extract private benefits of control at the expense of other shareholders. Moreover, the coefficients of UCF are positive and statistically significant 25 and 37 months post-IPO, indicating that high ultimate cash flow rights give controlling shareholders incentives to preserve their wealth and thus to maximize the firm's future performance. The signs and statistical significance of the estimated coefficients on control variables remain qualitatively unchanged.

**Sensitivity tests**

We perform several additional sensitivity tests including additional control variables, using an alternative measure for excess control and excluding the financial crisis period (2007-2008). The results are reported in Table 7. In columns 1, 2, and 3 of this table, we include additional control variables that were used in previous studies, such as *Audit*, *Hot_period*, and *Number_of_risks*, respectively[7]. In column 4, we use *Expropriation* as an alternative measure for excess control. *Expropriation* equals the difference between controlling rights and cash flow rights of the largest shareholders. Finally, we exclude from the sample IPOs that are listed during the financial crisis of 2007-2008. All findings remain qualitatively the same as those reported in previous tables.

7. *Audit* is a dummy variable that takes 1 if the IPO is audited by one of the big audit firms, 0 otherwise. *Hot period* is a dummy variable that equals 1 if the IPO occurred from 1998 to 2000, zero otherwise. *Number_of _risks* is the number of risk factors listed in the prospectus.

**TABLE 6**
**The impact of control-ownership structure on the post-IPO long-term performance (WRTs)**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | WRT 13 month after IPO | | WRT 25 month after IPO | | WRT 37 month after IPO | | WRT 61 month after IPO | |
| Constant | 1.8385*** | 1.9842*** | 1.1067*** | 1.4050*** | 1.7761*** | 2.2458*** | 3.3483*** | 3.7667*** |
| | (3.8888) | (3.7844) | (2.5998) | (2.9867) | (3.8177) | (4.3375) | (5.7908) | (5.6871) |
| Excess_control | −0.7552* | | −0.5310** | | −0.8972*** | | −0.8729** | |
| | (−1.9419) | | (−2.0764) | | (−2.9612) | | (−2.5536) | |
| Excess_ratio | | −0.3840** | | −0.3511*** | | −0.5364*** | | −0.4936*** |
| | | (−2.3006) | | (−2.8806) | | (−3.7727) | | (−2.9486) |
| UCF | −0.0477 | −0.0325 | 0.4589** | 0.4326* | 0.6671** | 0.6350** | 0.3436 | 0.3171 |
| | (−0.2026) | (−0.1358) | (2.0584) | (1.8952) | (2.5709) | (2.4633) | (1.2373) | (1.1316) |
| LnAge | −0.0023 | −0.0032 | 0.0014 | 0.0012 | 0.0066* | 0.0063 | 0.0071* | 0.0068* |
| | (−0.8947) | (−1.2120) | (0.5707) | (0.4651) | (1.6511) | (1.5637) | (1.8388) | (1.7356) |
| LnAsset | 0.0691** | 0.0619* | 0.0953** | 0.0924** | 0.1822*** | 0.1800*** | 0.1258** | 0.1283** |
| | (1.9927) | (1.7351) | (2.3238) | (2.1813) | (3.7432) | (3.6427) | (2.3277) | (2.3379) |
| Ln_Size | −0.0917** | −0.0704 | −0.0914* | −0.0857* | −0.1644*** | −0.1608*** | −0.1223** | −0.1228* |
| | (−2.0947) | (−1.5992) | (−1.9459) | (−1.6996) | (−3.1327) | (−2.9165) | (−1.9847) | (−1.9068) |
| Offer_price | 0.0069* | 0.0077** | 0.0103*** | 0.0110*** | 0.0077 | 0.0087* | 0.0092** | 0.0101** |
| | (1.8159) | (2.0746) | (2.6130) | (2.7129) | (1.5228) | (1.6757) | (2.1638) | (2.3069) |
| Initial_Return | −0.0106** | −0.0113*** | −0.0054 | −0.0058 | −0.0080 | −0.0086 | −0.0050 | −0.0057 |
| | (−2.5407) | (−2.7062) | (−0.8951) | (−0.9655) | (−1.1551) | (−1.2594) | (−0.8528) | (−0.9657) |
| Underwriter | 0.2000** | 0.2013** | 0.0803 | 0.0822 | 0.2364* | 0.2373* | 0.1180 | 0.1155 |
| | (2.0882) | (2.0846) | (0.7995) | (0.8157) | (1.7161) | (1.7169) | (1.0087) | (0.9871) |
| Year dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Industry dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Observations | 402 | 402 | 402 | 402 | 351 | 402 | 402 | 351 |
| Adj. $R^2$ | 0.233 | 0.241 | 0.090 | 0.095 | 0.057 | 0.060 | 0.063 | 0.064 |

In this table, the dependent variable is market-based performance, measured as the WRTs accumulated for 13, 25, 37 and 61 months after the IPO. The independent variables, measured at IPO year, include the degree of excess control rights (Excess_control), and (Excess_ratio) equal to control rights over ownership rights. the ultimately controlling shareholder's cash flow rights (UCF), Also included are (LnAge) is the age of the IPO at the offering (in years), (LnAsset) is the log of total assets, (Ln_Size) is the number of shares, multiplied by the offer price, (Initial_Return) is the percentage change between the offer price and the first closing price, and (Underwriter) is a dummy variable which is equal to one if the lead underwriter is among the 25% most active ones, and zero otherwise. We construct this ranking using IPO proceeds over the sample period. p-values are in parentheses; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

## High-tech versus non-high tech firms

In this section, we attempt to check whether there is a systematic difference between high-tech and non-high-tech firms regarding the relationship between ownership structure and post IPO long-term performance. Benveniste and Spindt (1989) observe that high-tech firms are younger, suffer from greater information asymmetry and are thus most likely to benefit from information acquisition during the book-building period. In the same vein, Kim *et al.* (2008) expect a higher degree of information asymmetry and increased investor uncertainty for highly leveraged high-tech firms.

During the high technology boom in the late 1990th, the characteristics of high-tech IPOs were considerably different from those of non-high-tech ones. Bratov *et al.* (2002) show that a majority of high-tech IPOs have little pre-IPO revenues which results in less or no profits. They are considered risky firms since their operating cash flows tend to be more volatile. Pukthuanthong-le and Walker (2008) investigate whether the relationship between insider ownership and underpricing differs between high-tech and non-high-tech IPOs. They find that insiders of high-tech firms tend to increase their pre-IPO ownership when they anticipate underpricing to be high. In the same vein, Kim *et al.* (2008) focus on the impact of leverage for high-tech and non-high-tech firms on IPO underpricing. The authors conclude that high leverage for high-tech firms is related to greater risk and uncertainty, leading to higher underpricing. In our context, we concentrate on how the link between ownership-control structure and long-term performance differs depending on whether an IPO firm operates in the high-tech sector or not. Following prior studies, we expect long-term performance of high-tech IPOs to rise with the ultimate cash flow rights of the largest controlling shareholders since large insider ownership serves as a "certification" mechanism that guarantees convergence of interests between insiders and outside shareholders, leading to better long-term firm performance. In contrast, separating ownership from control of high-tech IPOs would yield to an entrenchment behavior that eventually lowers long-term performance since high-tech IPOs are exposed to more asymmetric information and uncertainty compared to non-high-tech ones.

Table 8 compares firm characteristics between high-tech and non-high-tech firms. The separation of control rights and

**TABLE 7**
**Sensitivity tests**

| | Additional control variables | | | Expropriation | Excluding 2007–2008 period |
|---|---|---|---|---|---|
| **Variable** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** |
| Constant | −0.5050 | −0.5685 | −0.5804 | −0.9516** | −0.5549 |
| | (−1.0351) | (−1.1910) | (−1.2157) | (−1.9768) | (−1.1315) |
| Excess_control | −1.0402*** | −0.9463*** | −1.0055*** | | −1.0786*** |
| | (−2.8196) | (−2.6071) | (−2.7471) | | (−2.8183) |
| Expropriation | | | | −0.0451** | |
| | | | | (2.4809) | |
| UCF | 0.5728** | 0.6012** | 0.5742** | 0.7974*** | 0.6040** |
| | (2.3151) | (2.4267) | (2.2944) | (3.3260) | (2.2974) |
| LnAge | −0.0003 | 0.0001 | −0.0001 | −0.0019 | −0.0004 |
| | (−0.0960) | (0.0263) | (−0.0493) | (−0.6307) | (−0.1344) |
| LnAsset | 0.0974** | 0.0957** | 0.0975** | 0.0804* | 0.1119** |
| | (2.2811) | (2.1530) | (2.1917) | (1.8083) | (2.4349) |
| Ln_Size | −0.1169** | −0.0879* | −0.0902* | −0.0739 | −0.1086** |
| | (−2.4258) | (−1.8217) | (−1.8945) | (−1.5172) | (−2.2043) |
| Offer_price | 0.0104** | 0.0097** | 0.0096** | 0.0089* | 0.0091** |
| | (2.3877) | (2.1773) | (2.1668) | (1.9578) | (1.9779) |
| Initial_Return | 0.0054 | 0.0080 | 0.0075 | 0.0067 | 0.0074 |
| | (0.4859) | (0.7235) | (0.6733) | (0.6051) | (0.6623) |
| Underwriter | 0.1734 | 0.1716 | 0.1693 | 0.1731 | 0.1900* |
| | (1.6174) | (1.6076) | (1.5810) | (1.5837) | (1.6887) |
| Audit | 0.1673* | | | | |
| | (1.7036) | | | | |
| Hot_period | | −0.6797* | | | |
| | | (−1.8569) | | | |
| Number_of_risks | | | −0.0050 | | |
| | | | (−0.5337) | | |
| Year dummies | Yes | Yes | Yes | Yes | Yes |
| Industry dummies | Yes | Yes | Yes | Yes | Yes |
| Observations | 402 | 402 | 402 | 402 | 374 |
| Adj. $R^2$ | 0.194 | 0.196 | 0.189 | 0.183 | 0.205 |

This table reports the results of sensitivity tests. For sake of parsimony, only results using the dependent variable CAR 25 months after IPO are reported in this table. In columns 1, 2 and 3, we incorporate additional control variables used in prior studies namely auditor prestige, hot period and number of risks. In column 4, we use expropriation (UCO−UCF) as an alternative proxy for excess control. In column 5, we exclude firms listed during the crisis period (2007–2008). Also included are (LnAge) is the age of the IPO at the offering (in years), (LnAsset) is the log of total assets, (Ln_Size) is the number of shares, multiplied by the offer price, (Initial_Return) is the percentage change between the offer price and the first closing price, and (Underwriter) is a dummy variable which is equal to one if the lead underwriter is among the 25% most active ones, and zero otherwise. We construct this ranking using IPO proceeds over the sample period. (High-Tech) is a dummy variable which equal one if the underwriter's quality ranking, compiled as the total proceeds of IPOs underwritten by the lead underwriter during the sample period in percent of total proceeds, exceeds the third quartile, and zero otherwise. p-values are in parentheses; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

cash flow rights is less important in high-tech IPO firms than other newly-listed firms. The average mean (median) excess control is 8.1% (5%) for high-tech firms where it is 9% (12%) for the other, suggesting that owners of high-tech firms are less likely to consume private benefits of control at the expense of minority shareholders. In other words, our main results do not seem to be driven by high-tech firms. Owners of high-tech firms own on average a substantial ownership stake in their firms that amounts to 39% (Median 38%) compared to 46% (Median 42%) for the owners of other firms. These differences are statistically significant at the conventional levels. Moreover, on average, high-tech firms are younger, smaller, have lower offer price, and exhibit lower initial returns.

To further understand whether our results depending whether IPO firms belong or not to the high-tech industry, we rerun our main model while including a dummy variable *Hightech* that equals to one for firms in high-tech industries, and zero otherwise. We also interact this variable with *Excess_control*, *Excess_ratio*, and *UCF*, each in a different specification. Tables 9, 10 and 11 present the results where the long-term performance of the IPO firms is measured using CARs, BHARs, and the relative wealth ratio, respectively. These measures are computed 13, 25, 37 and 61 months after the date of the offering. The results consistently show that all the interaction terms are non-statistically significant, suggesting that our main results are not driven by high-tech firms. In other words, there is no evidence that the presence of a separation of control and cash-flow rights in high-tech firms leads to lower long-term performance. Owners of these firms do not seem to use control—enhancing devises to extract private benefits of control.

**TABLE 8**
**Descriptive statistics for subsamples and Difference-Between-Means (Medians) t-statistics**

| Variables | High-tech (N=182) | | Non high-tech firms (N=220) | | Mean difference High vs. Non-High | Median difference High vs. Non-High |
|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | | |
| Excess_control | 0.081 | 0.05 | 0.09 | 0.12 | 1.935* | 2.502** |
| UCF | 0.39 | 0.38 | 0.46 | 0.42 | 3.620*** | 3.315*** |
| Age | 10.07 | 8.00 | 16.76 | 11.00 | 4.483*** | 4.795*** |
| Asset | 229574.90 | 30555.89 | 547438.90 | 64997.40 | 1.163 | 4.028*** |
| Size | 75195.58 | 10714.12 | 95956.55 | 9928.06 | 0.561 | −0.629 |
| Offer_price | 18.41 | 16.00 | 21.10 | 18.29 | 2.190** | 2.575*** |
| Initial_Return | 0.36 | 0.00 | 1.82 | 0.00 | 1.795* | 2.186** |
| Underwriter | 0.42 | 0.00 | 0.40 | 0.00 | −0.35 | −0.354 |

This table reports descriptive statistics for subsamples (high-tech and non-high-tech firms) and difference between means and median t-statistics.

**TABLE 9**
**Does control-ownership structure differently impact the post-IPO long-term performance of High tech firms? (CARs)**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | CAR 13 month after IPO | | CAR 25 month after IPO | | CAR 37 month after IPO | | CAR 61 month after IPO | |
| Constant | 0.3256 | 0.4026 | 0.4032 | 1.0994* | 0.6874 | 1.4140** | 1.4391** | 2.1302** |
| | (0.8409) | (0.8059) | (0.7770) | (1.7026) | (1.1536) | (2.0435) | (1.9703) | (2.3862) |
| Excess_control | −0.4997 | | −1.3990*** | | −1.4411*** | | −1.0586 | |
| | (−1.2974) | | (−2.8315) | | (−2.8544) | | (−1.5120) | |
| Excess_control*High-Tech | −0.0014 | | 0.0065 | | 0.0045 | | −0.0016 | |
| | (−0.2616) | | (0.9582) | | (0.6661) | | (−0.1843) | |
| Excess_ratio | | −0.2489 | | −0.8186*** | | −0.8523*** | | −0.7535** |
| | | (−1.0629) | | (−3.0340) | | (−3.5413) | | (−2.1071) |
| Excess_ratio*High-Tech | | −0.0312 | | 0.4053 | | 0.3814 | | 0.1906 |
| | | (−0.1102) | | (1.2080) | | (1.2643) | | (0.4492) |
| UCF | −0.0014 | 0.2913 | 0.4056 | 0.3770 | 0.5592* | 0.5258 | 0.7192* | 0.6485 |
| | (−0.2616) | (1.3357) | (1.3240) | (1.2309) | (1.6563) | (1.5600) | (1.7327) | (1.5707) |
| UCF*High-Tech | −0.0023 | −0.0022 | 0.0038 | 0.0040 | 0.0004 | 0.0009 | −0.0005 | 0.0004 |
| | (−0.6797) | (−0.6376) | (0.7682) | (0.7899) | (0.0856) | (0.1669) | (−0.0735) | (0.0540) |
| LnAge | −0.0015 | −0.0022 | 0.0001 | −0.0004 | 0.0026 | 0.0020 | 0.0006 | 0.0001 |
| | (−0.6496) | (−0.9445) | (0.0270) | (−0.1474) | (0.7878) | (0.5935) | (0.1707) | (0.0187) |
| LnAsset | 0.0659** | 0.0588** | 0.1084** | 0.1036** | 0.1385*** | 0.1323*** | 0.0436 | 0.0404 |
| | (2.2654) | (2.0177) | (2.4978) | (2.3441) | (3.0285) | (2.8569) | (0.7670) | (0.7100) |
| Ln_Size | −0.0669* | −0.0488 | −0.1063** | −0.0958* | −0.1197** | −0.1066** | −0.0601 | −0.0488 |
| | (−1.9531) | (−1.4651) | (−2.2260) | (−1.9180) | (−2.3680) | (−2.0254) | (−1.0076) | (−0.7998) |
| Offer_price | 0.0056* | 0.0057* | 0.0091** | 0.0089* | 0.0030 | 0.0025 | 0.0029 | 0.0023 |
| | (1.9278) | (1.8914) | (2.0990) | (1.9641) | (0.5993) | (0.4802) | (0.5191) | (0.4023) |
| Initial_Return | −0.0084* | −0.0088* | 0.0081 | 0.0071 | −0.0019 | −0.0030 | −0.0060 | −0.0068 |
| | (−1.7988) | (−1.9017) | (0.7415) | (0.6512) | (−0.1666) | (−0.2590) | (−0.4323) | (−0.4941) |
| Underwriter | 0.1399* | 0.1443* | 0.1830* | 0.1870* | 0.2948** | 0.3017** | 0.1463 | 0.1569 |
| | (1.7922) | (1.8454) | (1.6984) | (1.7324) | (2.3061) | (2.3530) | (0.9636) | (1.0305) |
| High-Tech | 0.1803 | 0.2008 | −0.0730 | −0.4723 | 0.0128 | −0.3907 | 0.2250 | −0.0447 |
| | (0.9376) | (0.4973) | (−0.2852) | (−0.9298) | (0.0455) | (−0.7675) | (0.6236) | (−0.0643) |
| Year dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Industry dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Observations | 402 | 402 | 402 | 402 | 402 | 402 | 402 | 402 |
| Adj. $R^2$ | 0.274 | 0.276 | 0.190 | 0.188 | 0.133 | 0.131 | 0.078 | 0.076 |

In this table, the dependent variable is market-based performance, measured as the CARs accumulated for 13, 25, 37 and 61 months after the IPO. The independent variables, measured at IPO year, include the degree of excess control rights (Excess_control), and (Excess_ratio) equal to control rights over ownership rights. the ultimately controlling shareholder's cash flow rights (UCF), Also included are (LnAge) is the age of the IPO at the offering (in years), (LnAsset) is the log of total assets, (Ln_Size) is the number of shares, multiplied by the offer price, (Initial_Return) is the percentage change between the offer price and the first closing price, and (Underwriter) is a dummy variable which is equal to one if the lead underwriter is among the 25% most active ones, and zero otherwise. We construct this ranking using IPO proceeds over the sample period. (High-Tech) is equal to one for firms in high-tech industries, and zero otherwise. p-values are in parentheses; *, **, and *** indicate significance at the 10%, 5% and 1% respectively.

**TABLE 10**
**Does control-ownership structure differently impact the post-IPO long-term performance of High tech firms? (BHRs)**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | BHR 13 month after IPO | | BHR 25 month after IPO | | BHR 37 month after IPO | | BHR 61 month after IPO | |
| Const | 0.8470 | 0.9013 | −0.0300 | 0.6146 | 0.2229 | 1.1220* | 1.4133*** | 1.9001*** |
| | (1.2596) | (1.1601) | (−0.0552) | (0.9584) | (0.4182) | (1.7005) | (2.8173) | (3.2227) |
| Excess_control | −0.4382 | | −0.9680* | | −1.5520** | | −0.9909** | |
| | (−0.7337) | | (−1.8794) | | (−2.4730) | | (−2.2726) | |
| Excess_control*High-Tech | −0.0093 | | 0.0055 | | 0.0097 | | 0.0031 | |
| | (−1.0472) | | (0.7910) | | (1.3206) | | (0.5455) | |
| Excess_ratio | | −0.3214 | | −0.7128*** | | −0.9903*** | | −0.5839** |
| | | (−1.0933) | | (−2.6999) | | (−3.2400) | | (−2.5807) |
| Excess_ratio*High-Tech | | −0.2794 | | 0.4531 | | 0.6564* | | 0.2229 |
| | | (−0.7552) | | (1.4254) | | (1.9526) | | (0.8203) |
| UCF | 0.0525 | 0.0475 | 0.3694 | 0.3136 | 0.4191 | 0.3632 | 0.3586 | 0.3370 |
| | (0.1488) | (0.1362) | (1.1219) | (0.9535) | (0.9340) | (0.8187) | (1.0192) | (0.9525) |
| UCF*High-Tech | −0.0028 | −0.0023 | 0.0064 | 0.0068 | 0.0039 | 0.0043 | −0.0008 | −0.0007 |
| | (−0.4734) | (−0.3754) | (1.0767) | (1.1262) | (0.6272) | (0.6956) | (−0.1741) | (−0.1536) |
| LnAge | −0.0037 | −0.0049 | 0.0011 | 0.0008 | 0.0069 | 0.0065 | 0.0056* | 0.0052 |
| | (−1.0097) | (−1.3166) | (0.3405) | (0.2477) | (1.3584) | (1.2755) | (1.6642) | (1.5375) |
| LnAsset | 0.0937* | 0.0833* | 0.1183** | 0.1137* | 0.1901*** | 0.1873*** | 0.1184** | 0.1201** |
| | (1.9533) | (1.6830) | (2.0911) | (1.9428) | (3.1840) | (3.0940) | (2.4266) | (2.4309) |
| Ln_Size | −0.1268** | −0.0951 | −0.1024* | −0.0930 | −0.1623*** | −0.1562** | −0.1024* | −0.1003* |
| | (−2.0518) | (−1.5164) | (−1.7058) | (−1.4224) | (−2.6855) | (−2.4515) | (−1.9199) | (−1.7997) |
| Offer_price | 0.0079 | 0.0090* | 0.0128** | 0.0139** | 0.0064 | 0.0073 | 0.0086** | 0.0095** |
| | (1.5211) | (1.8365) | (2.1798) | (2.3311) | (1.0221) | (1.1246) | (2.0680) | (2.2110) |
| Initial_Return | −0.0126** | −0.0131** | −0.0036 | −0.0043 | −0.0063 | −0.0074 | −0.0015 | −0.0022 |
| | (−1.9963) | (−2.0821) | (−0.4257) | (−0.5075) | (−0.7444) | (−0.8720) | (−0.2431) | (−0.3550) |
| Underwriter | 0.2354* | 0.2443* | 0.0960 | 0.0992 | 0.2690* | 0.2695 | 0.1203 | 0.1179 |
| | (1.7745) | (1.8263) | (0.7186) | (0.7364) | (1.6598) | (1.6411) | (1.1865) | (1.1563) |
| High-Tech | 0.3971 | 0.5997 | −0.3609 | −0.8478* | −0.5373* | −1.2096** | 0.0073 | −0.2153 |
| | (1.1574) | (1.0012) | (−1.3049) | (−1.6881) | (−1.6688) | (−2.0443) | (0.0293) | (−0.4695) |
| Year dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Industry dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Observations | 402 | 402 | 402 | 402 | 402 | 402 | 402 | 402 |
| Adj. $R^2$ | 0.228 | 0.236 | 0.072 | 0.079 | 0.052 | 0.054 | 0.097 | 0.098 |

In this table, the dependent variable is market-based performance, measured as the CARs accumulated for 13, 25, 37 and 61 months after the IPO. The independent variables, measured at IPO year, include the degree of excess control rights (Excess_control), and (Excess_ratio) equal to control rights over ownership rights. the ultimately controlling shareholder's cash flow rights (UCF), Also included are (LnAge) is the age of the IPO at the offering (in years), (LnAsset) is the log of total assets, (Ln_Size) is the number of shares, multiplied by the offer price, (Initial_Return) is the percentage change between the offer price and the first closing price, and (Underwriter) is a dummy variable which is equal to one if the lead underwriter is among the 25% most active ones, and zero otherwise. We construct this ranking using IPO proceeds over the sample period. (High-Tech) is equal to one for firms in high-tech industries, and zero otherwise. p-values are in parentheses; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

**TABLE 11**
**Does control-ownership structure differently impact the post-IPO long-term performance of High tech firms? (WRTs)**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | WRT 13 month after IPO | | WRT 25 month after IPO | | WRT 37 month after IPO | | WRT 61 month after IPO | |
| Const | 1.6908*** | 1.7458*** | 1.2801*** | 1.8074*** | 1.9792*** | 2.7950*** | 3.3256*** | 3.9356*** |
| | (3.4824) | (3.0720) | (3.0804) | (3.7511) | (4.1652) | (4.9223) | (5.6261) | (5.6605) |
| Excess_control | −0.3515 | | −0.8153** | | −1.3573*** | | −1.0017** | |
| | (−0.8172) | | (−2.1115) | | (−2.7186) | | (−2.0970) | |
| Excess_control*High-Tech | −0.0065 | | 0.0049 | | 0.0073 | | 0.0021 | |
| | (−1.0305) | | (0.8747) | | (1.1270) | | (0.3220) | |
| Excess_ratio | | −0.2431 | | −0.5814*** | | −0.8865*** | | −0.6642*** |
| | | (−1.1373) | | (−3.2012) | | (−3.8474) | | (−2.7457) |
| Excess_ratio*High-Tech | | −0.2235 | | 0.3830 | | 0.5564* | | 0.2727 |
| | | (−0.7492) | | (1.4868) | | (1.8334) | | (0.8258) |
| UCF | 0.0917 | 0.0926 | 0.2125 | 0.1685 | 0.4856 | 0.4321 | 0.4541 | 0.4061 |
| | (0.3560) | (0.3638) | (0.8808) | (0.6971) | (1.3045) | (1.1711) | (1.1157) | (0.9928) |
| UCF*High-Tech | −0.0021 | −0.0019 | 0.0047 | 0.0050 | 0.0024 | 0.0027 | −0.0024 | −0.0021 |
| | (−0.4912) | (−0.4324) | (1.0544) | (1.0971) | (0.4386) | (0.5074) | (−0.4515) | (−0.3803) |
| LnAge | −0.0024 | −0.0032 | 0.0015 | 0.0012 | 0.0065 | 0.0062 | 0.0072* | 0.0069* |
| | (−0.8808) | (−1.1685) | (0.5949) | (0.4835) | (1.6401) | (1.5457) | (1.8444) | (1.7504) |
| LnAsset | 0.0731** | 0.0662* | 0.0977** | 0.0942** | 0.1709*** | 0.1677*** | 0.1216** | 0.1240** |
| | (2.1339) | (1.8869) | (2.3155) | (2.1674) | (3.3779) | (3.2730) | (2.2437) | (2.2600) |
| Ln_Size | −0.0952** | −0.0743* | −0.0934** | −0.0860* | −0.1560*** | −0.1503*** | −0.1185* | −0.1182* |
| | (−2.1804) | (−1.6890) | (−2.0383) | (−1.7487) | (−2.9706) | (−2.7321) | (−1.9382) | (−1.8524) |
| Offer_price | 0.0068* | 0.0076** | 0.0101** | 0.0108** | 0.0080 | 0.0089 | 0.0094** | 0.0103** |
| | (1.8094) | (2.0778) | (2.4633) | (2.5741) | (1.5073) | (1.6406) | (2.1476) | (2.2859) |
| Initial_Return | −0.0104** | −0.0108** | −0.0055 | −0.0061 | −0.0086 | −0.0095 | −0.0049 | −0.0056 |
| | (−2.3857) | (−2.4872) | (−0.9037) | (−1.0028) | (−1.2428) | (−1.3844) | (−0.8202) | (−0.9375) |
| Underwriter | 0.1875* | 0.1926** | 0.0924 | 0.0952 | 0.2535* | 0.2550* | 0.1179 | 0.1176 |
| | (1.9567) | (1.9885) | (0.9174) | (0.9352) | (1.8650) | (1.8530) | (0.9999) | (0.9937) |
| High-Tech | 0.2521 | 0.4351 | −0.2866 | −0.6914* | −0.4142 | −0.9941** | 0.0535 | −0.2486 |
| | (1.0014) | (0.9404) | (−1.3115) | (−1.7541) | (−1.5718) | (−1.9758) | (0.1927) | (−0.4676) |
| Year dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Industry dummies | Included | Included | Included | Included | Included | Included | Included | Included |
| Observations | 402 | 402 | 402 | 402 | 402 | 402 | 402 | 402 |
| Adj. $R^2$ | 0.230 | 0.238 | 0.085 | 0.091 | 0.059 | 0.063 | 0.056 | 0.058 |

In this table, the dependent variable is market-based performance, measured as the CARs accumulated for 13, 25, 37 and 61 months after the IPO. The independent variables, measured at IPO year, include the degree of excess control rights (Excess_control), and (Excess_ratio) equal to control rights over ownership rights. the ultimately controlling shareholder's cash flow rights (UCF), Also included are (LnAge) is the age of the IPO at the offering (in years), (LnAsset) is the log of total assets, (Ln_Size) is the number of shares, multiplied by the offer price, (Initial_Return) is the percentage change between the offer price and the first closing price, and (Underwriter) is a dummy variable which is equal to one if the lead underwriter is among the 25% most active ones, and zero otherwise. We construct this ranking using IPO proceeds over the sample period. (High-Tech) is equal to one for firms in high-tech industries, and zero otherwise. p-values are in parentheses; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

## Conclusion

There has been very little research on the effect of ownership structure on the long-run performance of IPOs. In this study, we improve our understanding of how ownership–control structure, especially the separation of control and cash flow rights of the largest shareholders, affects IPO performance in the long run. To date, research on this topic is limited to developing markets and is non-existent in developed countries. For instance, we provide new evidence for one of the most active European developed markets (i.e., France). An additional attractive feature is that French corporations are characterized by a concentrated ownership structure.

Using a sample of 402 French IPOs listed during the 1997-2011 period, we investigate the impact of ownership–control structure on IPO long-term performance 1, 2, 3, and 5 years after listing. Several interesting findings emerge from this analysis. First, we find that IPOs perform worse when there is a wedge between ownership and control rights of the dominant shareholders. This result is consistent with the view that the separation between control and cash flow rights gives the majority shareholder the power and the incentive to extract private benefits to the detriment of minority shareholders. On the other hand, we find that both CAR and BHR increase with the ownership interests of the controlling shareholders. This result suggests that higher cash flow rights lessen the controlling shareholder's incentive to extract private benefits, which enhances the IPO's long-run performance.

The present study is subject to certain limitations. First, the initial offerings are from a developed market with a specific market organization, which limits the generalizability of the results to other emerging markets where the problem of control-ownership wedge is severe. Given the growing availability of data, the generalizability of the results can be enhanced by conducting similar studies for other economies such as in East Asia and Central and East Europe where ownership structures are highly concentrated.

Moreover, this study shows that the divergence of control and cash flow rights partly explain the long-term underperformance of French IPOs. However, it does not consider whether there are other large shareholders in the firm that may play an important monitoring role and limit the extraction of private benefits of control. The role of the controlling shareholder after the IPO could be affected by the presence of other blockholders who have the incentive, the power and the means to closely monitor the firm and make sure that is being run in the best interests of all its constituents. A very interesting research avenue would consider the outcome of the power interplay between multiple large shareholders following IPOs.

This study shows that the high-tech firms do not behave differently from others following IPOs with respect to the relationship between control-ownership wedge and long-term firm performance. Hence, the greater uncertainty they face does not seem to materially affect the extraction of private benefit after an IPO. A possible extension would be to focus on whether the high-tech non-high-tech differences can affect the managerial decisions to make IPOs or not.

All these findings taken together clearly show that firms do suffer from a large long-term underperformance in the presence of substantial control-ownership wedge. This result holds irrespective whether the newly-introduced entities in the stock market are high tech or non-high tech firms. These results are interesting for academics, managers, and policymakers alike. They put the debate on the one-share-one-vote principle in the forefront of the corporate governance agenda. It suggests that dual-class shares are not exempt of downside effects and that streamlining and trimming pyramid structures could reduce control-ownership wedge, limiting the divergence of interests between controlling and minority shareholders and improving the long-term performance of IPOs in concentrated ownership settings. Policymakers can find new insights in this paper on the effect of control-wedge in shaping firm performance that can help them justifying their decisions regarding the adoption of control-enhancing mechanisms and improving corporate governance. These research findings may also help investors decide whether to invest or not when control rights depart from ownership rights. Our results increase their awareness about the risks they incur when investing in these kind of concentrated ownership firms.

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**APPENDIX 1**
**Description of independent variables**

| Variable | Definition |
|---|---|
| UCO | UCO is the post-IPO control rights of the ultimate owner. |
| UCF | UCF is the post-IPO cash flow rights of the ultimate owner. |
| Excess_control | The difference between the control rights and cash flow rights of the ultimate owner, all divided by her control rights; *Excess_control = (UCO-UCF)/UCO*. |
| Excess_ratio | The ratio of the control rights to cash flow rights; *Excess_ ratio=UCO/UCF.* |
| Expropriation | The difference between the control rights and cash flow rights of the ultimate owner; *Expropriation= UCO-UCF.* |
| LnAge | Age of the firm (in years) at the offering measured as the natural logarithm of the difference between the year of introduction and the year in which the company was founded. |
| LnAsset | The natural logarithm of the total assets at the offering. |
| Ln_Size | Size of the offering calculated as the natural logarithm of the gross proceeds; *Ln (Size) = ln (Number of shares x offering price)*. |
| Offer_price | The offer price of the IPO. |
| Initial_Return | Initial return is the difference between the closing price at the first trading day and the offering price, all divided by the offering price. |
| Underwriter | Underwriter is a dummy variable which is equal to one if the lead underwriter is among the 25% most active ones, and zero otherwise. We construct this ranking using IPO proceeds over the sample period. |
| Audit | Audit is a dummy variable that takes one if the IPO is audited by one of the big audit firms, and zero otherwise. |
| Hot_period | Hot_period is a dummy variable that equals one if the IPO occurred from 1998 to 2000, and zero otherwise. |
| Number_of_risks | Number_of_risks is the number of risk factors listed in the prospectus. |