Leaving Less Money on the Table: Evidence on the Entrenchment Effect of Employee Ownership from IPO Underpricing

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Abstract

Employee ownership (EO) is an acknowledged takeover deterrent, given employees' tendency to ally with incumbent management as well as their increased reservation price when considering the sale of shares to a bidder. This study contributes to EO takeover deterrence literature by utilising IPOs, when firms' ownership structures are first vulnerable to significant changes, as a novel setting. Using entrenchment theory (i.e., the notion that firms deliberately underprice their IPOs to reduce takeover threats and achieve a certain level of ownership dispersion), I argue that EO and IPO underpricing are means to the same end, though underpricing represents a cost to the firm in the form of money left 'on the table'. With a dataset of European firms, I show that firms with pre-IPO broad-based EO experience 2.2 % less IPO underpricing. Analysing the underlying mechanisms of this result, I find that takeover deterrence is a more likely explanation than the reduction of monitoring, given that EO reduces total blockholdings after the IPO only slightly. This suggests that EO acts as a signal of reduced M&A activity to investors.

EFM Classification: 150, 230

1. Introduction

I empirically examine how employee ownership (EO) affects initial public offering (IPO) underpricing. Using entrenchment theory (Booth and Chua, 1996; Brennan and Franks, 1997), I argue that both are related in their consequences in that they are mechanisms of influencing corporate ownership dispersion. My contribution is thus at the intersection of these research areas, utilising their interrelation to gain novel insights. Prior work often uses share price reactions or changes in takeover legislation to show the entrenchment effect of EO (e.g., Gordon and Pound, 1990; Chaplinsky and Niehaus, 1994; Beatty, 1995; Rauh, 2006). I use IPOs as a new avenue of proof for EO as a takeover defence, showing its strategic effectiveness. Furthermore, I investigate the mechanisms of entrenchment and use M&A activity literature to derive a novel channel.

Entrenchment theory stipulates that firms choose the level of post-IPO ownership dispersion ex-ante, inducing an underpricing equilibrium such that proceeds are maximised. By rationing shares, excess demand is generated, reducing the likelihood of any one investor becoming a blockholder.[1] However, IPO underpricing is costly to the firm because it represents money left 'on the table'. Given that EO contributes to entrenchment without this drawback, I expect that EO firms aiming require a lower level of underpricing than non-EO firms. By investigating this interrelation, I aim to show that EO is a strategic method of entrenchment. I present evidence that EO firms experience 2.2 % less underpricing than non-EO firms.

I provide possible explanations for this downward effect on underpricing by exploring how the entrenchment mechanism of pre-IPO EO manifests itself. To this end, I use hand-collected ownership data to analyse the incidence of blockholdings in EO and non-EO firms. I find that EO slightly reduces blockholdings and that this effect is augmented when looking at large EO plans that are more capable of blocking takeover attempts. This finding is likely driven by EO signalling an IPO firm's reduced takeover likelihood, as there is little support for an effective decrease in monitoring incentives of blockholders.

I analyse testable implications empirically using a dataset of listed European firms that provides information on EO for each firm-year, supplemented by financial, IPO, and ownership data. I aim to provide new insights by combining three strands of literature in

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[1]The motivations behind this are improved liquidity (Booth and Chua, 1996) and reduced monitoring (Brennan and Franks, 1997).

a European (as opposed to an otherwise largely U.S.) setting.

First, I contribute to the literature on entrenchment theory of IPO underpricing. Using Brennan and Franks (1997)'s proposition that underpricing is used deliberately to ration shares and reduce the likelihood of blockholdings, I show that because EO is also a method of entrenchment, the need to underprice is reduced. Past research on entrenchment attempts during the IPO process has used dual-class share structures as the main explanatory variable (e.g., Smart and Zutter, 2003; Boulton et al., 2010), given their ability to transfer control rights to insiders. EO works in a similar manner, transferring control rights to a party naturally allied with incumbent management, which they prefer to income risks and monitoring that outsiders present to them (Pagano and Volpin, 2005).

Existing studies on EO entrenchment analyse its effectiveness at deterring takeovers, measured by stock price reactions (e.g., Gordon and Pound, 1990; Chaplinsky and Niehaus, 1994; Beatty, 1995). Here, my paper contributes by using IPOs as a thus far unexplored setting where control considerations inherent to EO can directly impact a firm's ownership structure. By showing that EO firms have more dispersed post-IPO ownership, I provide proof of EO's strategic effectiveness, rather than its perceived effectiveness. Furthermore, studies within this literature focus on established public companies. In contrast, my paper examines how EO impacts a private firm's initial venture into separated ownership and control.

This is closely related to a third strand of literature relating perceived takeover likelihood at the IPO to resulting underpricing and ownership dispersion. Boulton et al. (2010) find that pre-IPO M&A activity is related to higher underpricing, though this relation disappears when looking at effectively entrenched firms, indicated by dual-class shares. I use EO as a further measure of entrenchment. Given investors' ability to use public information to anticipate an IPO firm's takeover likelihood, I extend Anderson et al. (2017)'s approach to investigate whether EO impacts this anticipation.

The remainder of this paper is structured as follows. Section 2 details the underlying theories and develops hypotheses. In Section 3, I provide details on my sample and variables as well as outlining the empirical strategy. Section 4 presents and discusses the results of my analyses. I conclude in Section 5.

2. Hypotheses

Prior literature examining the effects of EO on corporate control consistently provides evidence of takeover deterrence. Takeovers can entail changes to a target company's employment structure, putting employees' income at risk. Hence, employees often oppose takeovers—armed with company shares, they can do so actively (Gordon and Pound, 1990; Pagano and Volpin, 2005). Gordon and Pound (1990) find that employee stock ownership plans (ESOPs) reduce share value when issued by firms that are the subject of takeover announcements or when they transfer control to insiders in lieu of outsiders. Chaplinsky and Niehaus (1994) identify the cause of this deterrence effect to be rooted in employees' higher reservation price when considering selling their shares to a bidder. Beatty (1995) qualifies the magnitude of a share price reaction to ESOP announcements to depend on takeover probability and the ESOP's deterrence effectiveness.

Most studies analyse the entrenchment effect of EO by focusing on share price reactions to ESOP announcements or utilising changes in takeover legislation (e.g., Rauh, 2006). Furthermore, they are based on established public companies. I seek to further explore this effect in the thus far unexplored setting of IPOs. This enables me to infer how EO affects a private firm's initial exposure to separate ownership and control. Given the change of ownership structure occurring at the IPO and the possibility of the creation of blockholdings that could present a future takeover risk, IPOs are further viable avenues for examining the strategic effectiveness of EO.

In fact, firms have been theorised to influence post-IPO ownership dispersion by underpricing their shares. According to Booth and Chua (1996), firms choose the level of post-IPO ownership dispersion, inducing an underpricing equilibrium such that proceeds are maximised. The rationale behind thus observable underpricing, as identified by *entrenchment theory*, is to disband blockholdings in order to reduce takeover risks as well as monitoring of current management by outsiders. This was proposed by Brennan and Franks (1997) in their *reduced monitoring hypothesis*. Field and Karpoff (2002) confirm the relevance of control issues at the IPO and find the use of takeover defences to be consistent with the rationales proposed by Brennan and Franks (1997).

Herein lies the commonality between EO and IPO underpricing that is the centrepiece of this study: both are a form of entrenchment. While to a certain degree, IPO underpricing is desirable (i.e., 'leaving a good taste in investors' mouths', Ibbotson, 1975), excessive

underpricing is a cost to the firm because it represents money left 'on the table'. Given that EO achieves a similar effect without this drawback, I hypothesise that the presence of EO mitigates the need for IPO underpricing. This corresponds to a study conducted by Smart and Zutter (2003), who find that firms with dual-class shares underprice less because voting control remains with managers. Due to employees' being 'natural allies' of managers (Pagano and Volpin, 2005), the use of EO should result in a similar effect.

I further seek to explore the impact of EO on the incidence of blockholders in a firm's post-IPO ownership structure. The direction of such an impact can provide further insights on the mechanism potentially driving a reduction of underpricing through EO. On the one hand, EO could result in a *more* concentrated ownership structure. Similar to the reasoning provided by Smart and Zutter (2003), given that EO firms underprice less, firm shares are not in fact rationed during the IPO process, which would not result in the creation of excess demand that is the driver of a more dispersed ownership structure according to Booth and Chua (1996). This would indicate that EO firms can afford to leave less money 'on the table' at the expense of more concentrated ownership because EO ensures firm survival when facing a takeover threat. A further suggestion of such an effect direction would be that the reduced monitoring hypothesis proposed by Brennan and Franks (1997) is not applicable.

Should EO, however, have a negative impact on blockholder ownership, this would point to a signalling effect. According to the *M&A anticipation hypothesis* proposed by Anderson et al. (2017), institutional shareholders can use public information to predict a firm's likelihood in becoming a takeover target, where likely targets are more likely to attract more concentrated ownership. Given that EO is a takeover deterrent, the presence of EO could therefore signal a reduced target likelihood, which should result in lower blockholder ownership. Compared with the line of argument provided by Smart and Zutter (2003), combining the reduced monitoring and M&A anticipation hypotheses offers a novel explanation of how methods of entrenchment influence control after the IPO.

In order to determine how the entrenchment effect of EO manifests itself, I follow Field and Sheehan (2004), using the first proxy statement available after the IPO to assess various measures of ownership dispersion, where each of these measures captures different dimensions of corporate control and leads to different expectations. Mainly,

I differentiate between blockholders' joint monitoring ability as well as the monitoring incentive of the largest blockholder (Aruğaslan et al., 2004).

It should be noted that the outlined effects on underpricing and ownership concentration are expected to occur only for *broad-based* EO, i.e. such EO that is accessible to all employees, not just executives. First, such EO is expected to make up a larger block of a firm's shares, making it more effective at deterring takeovers (Kim and Ouimet, 2014). Second, Fu et al. (2015) find no relation between executive-only EO and underpricing. Rather than having an entrenching effect, such EO substitutes the dilution of insider ownership occurring at the IPO.

3. Method

3.1. Data and Sample

Data on employee ownership is provided by the European Federation of Employee Share Ownership (EFES), entailing detailed information on listed European firms with a market capitalisation of at least 200 thousand Euros. The EFES data is provided as a panel from 2005-2016 and is based on financial statement disclosures. The date of the first EO plan is also provided. Descriptions of the history of EO for each firm allow me to derive the type of EO the first plan corresponds to, and more importantly whether this plan was open to all employees (i.e., whether it was 'broad-based').

Data on each firm's IPO is taken from the Securities Data Company (SDC) Platinum's *New Issues* database. Of the 3,092 firms comprising the core EFES sample of listed firms, 1,459 are successfully matched to SDC using ISINs and manual name matching. I am currently working to expand the number of matches. To calculate underpricing and corroborate SDC data, I use stock market data from Datastream. I identify the first closing price with a positive trading volume in Datastream. Frequently, this price will be preceded by another price that has no associated trading volume. In most cases, this price corresponds to the offer price set by the firm for its IPO. If the offer price in Datastream is missing or differs from the offer price reported in SDC, I manually confirm both the offer price and first closing price using LexisNexis. If the thus obtained offer price does not correspond to SDC, I exclude the entry as I cannot confirm the data's accuracy. At this stage, there are 940 eligible firms in the dataset.

I supplement this data with financial accounting data from the Worldscope database.

The required control variables thus obtained are available for 839 firms. Further control variables are provided by SDC itself, though they were frequently missing. Therefore, relevant data was taken directly from prospectuses, firm annual reports, and LexisNexis, where available. Full controls were finally available for 627 firms. Due to this stark reduction in available data, the sample is split into several panels (see Table 1).

Ownership data is hand-collected from prospectuses, proxy statements, and company websites (where absent from proxy statement). I use the first proxy statement following the IPO. In this manner, I am able to track pre and post-IPO blockholders, allowing me to determine which new blockholders enter a firm. This data is available for 792 firms.

3.2. Measures

Following prior underpricing literature, underpricing is measured as the discrete percent change between the IPO offer price and first closing price of firm i:

$$Underpricing_i = \frac{First\ closing\ price_i - Offer\ price_i}{Offer\ price_i}$$

To mitigate the effect of extreme cases of underpricing on my analyses, I omit firms with an IPO underpricing exceeding 100%.

The main explanatory variable intends to provide information on the presence of EO at the time of the IPO. To identify the impact of different types of EO, multiple operationalisations are used. The simplest variable is a dummy equal to 1 if the firm had any type of EO involving equity participation prior to its IPO.[2] However, EO can be set up to include only executive employees. Fu et al. (2015) show that such EO serves as a substitute for diluted insider ownership but is not in line with entrenchment theory or associated with underpricing. Therefore, a second specification of a dummy variable of EO takes on the value of 1 only when *broad-based* EO was present prior to the IPO, meaning that all employees are included. Finally, the impact of the magnitude of EO on block ownership is measured using the market capitalisation held by EO plans in the year prior to the IPO. However, as this figure is made available by EFES only starting in 2005,

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[2]The type of EO used must involve employees directly or indirectly owning company shares, as no entrenchment effect is to be expected otherwise. For example, profit sharing, where employees participate in firm profits without becoming owners, is insufficient, as there are no ownership-associated governance benefits for employees. EO schemes that do render employees owners include share awards, employee stock options (ESOs), employee stock purchase programmes (ESPPs), and employee share ownership plans (ESOPs). There is usually a vesting period involved with these types of ownership.

analyses using this variable only apply to IPOs in the analogous time frame.

Various control variables are introduced, informed by prior work on IPO underpricing. The first confounding construct I control for is the fundamental uncertainty investors have regarding a firm's value once it becomes public, known as ex-ante uncertainty (Ritter, 1984; Beatty and Ritter, 1986). Various proxies operationalising this construct have been proposed. Established firms with more operating history are expected to face lower uncertainty than younger firms, hence firm age is a viable control (Ritter, 1984). However, this operationalisation disregards volatility inherent to a firm's business model. A better measure of ex-ante uncertainty is given by firm sales, which Ritter (1984) also found to be a measure of asymmetric information risk.[3] Although gross proceeds of an issue were frequently used as a proxy in the past, Habib and Ljungqvist (1998) argue that these are related to underpricing due to dilution, regardless of uncertainty. Hence, gross proceeds are not regarded.

The valuation of an issuing firm may be subject to information spillovers from companies in the same industry. The performance of a given firm's industry may alter its perceived future prospects. I control for this using the prior 30-day return of an issuing firm's industry, determined using the Fama-French 48 industry classification (Ljungqvist and Wilhelm, 2003; Edelen and Kadlec, 2005). The return of each industry portfolio is taken from Kenneth French.

Bull markets are assumed to be positively correlated with underpricing and the number of IPOs. Therefore, as a control for market sentiment, the prior 30-day NASDAQ return is introduced (Lowry and Murphy, 2007).

Depending on how many shares a firm offers in its IPO, pre-issue shares held by insiders are diluted. Loughran and Ritter (2002) show that this dilution is offset by wealth gains experienced by insiders retaining pre-issue shares, caused by underpricing and positive offer price revisions. This holds unless the number of shares offered is critically larger than the pre-issue shares retained. Therefore, the greater the ratio of shares retained to shares offered (i.e. the *overhang*), the lower the dilution and the greater the wealth gain incurred by insiders due to underpricing. This leads to the expectation that IPOs with higher overhang face lower underpricing costs and are more likely to be subject to

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[3]The asymmetric information model proposed by Rock (1986) theorises that firms underprice their issues to keep uninformed investors in the market.

underpricing (Bradley and Jordan, 2002; Lowry and Murphy, 2007). Overhang is therefore included as a control variable.

In order to further address information asymmetry, dummy variables indicating whether the IPO firm has venture capital (VC) backing, was previously subject to a leveraged buyout (LBO), or is being carved out are implemented. Reverse LBO or carve-out firms are expected to have more public information available, lowering uncertainty and hence underpricing (Muscarella and Vetsuypens, 1989; Schipper and Smith, 1986). VC-backed IPOs have been found to face lower underpricing due to certification and monitoring by the venture capitalist (Megginson and Weiss, 1991; Barry et al., 1990). However, underpricing could also be higher due to grandstanding by the venture capitalist (Lee and Wahal, 2004). Due to the potential influence of VC-backing, it is included as a control.

During the offer period, information acquired from investors can be used to adjust the offer price. According to Benveniste and Spindt (1989), however, this adjustment is only partial in order to retain investors' incentive to disclose their private information. Hanley (1993) examines this empirically, confirming that the revelation of positive information results in greater underpricing. Following Hanley (1993), I measure the impact of private investor information using the percent difference between the offer price and the mean of the indicative price range, which was hand-collected from prospectuses. However, the indicative price range is often publicised in a document separate from the prospectus which was often unavailable. Although many price ranges could be inferred from LexisNexis, the inclusion of the offer price revision variable reduces the sample size, therefore analyses including this variable are carried out separately.

To measure the level of post-IPO ownership dispersion, I hand-collect the proportion of shares held by outside shareholders (or blockholders) holding at least 5% as indicated on the first proxy statement following the IPO. Following Field and Sheehan (2004), I define outside shareholders as those shareholders who are not employed by the firm and who are not mentioned on the prospectus. In a further specification, I use only those blockholders who are not individuals or trusts held on their behalf. These corporate blockholders could be deemed to be more relevant within entrenchment theory, as they can better monitor management and pose a greater takeover threat (Field and Sheehan, 2004). I also compute the proportion of shares held by the largest blockholder as well as the number of blockholders.

Control variables influencing a firm's ownership dispersion are less well defined in literature than those for underpricing, though there is some overlap. As in Demsetz and Lehn (1985), I introduce controls for firm size (measured by total assets in the year after the IPO) and firm volatility (volatility of returns in the year after the IPO). The debt ratio is also expected to influence ownership, as are the previously introduced dummies for VC-backing, reverse LBOs, and carve-outs. I use tangibility, which is the ratio of fixed assets (i.e., property, plant, and equipment) to total assets, as a control for agency costs (Field and Sheehan, 2004). Overhang is also relevant, as a higher retention of shares could reflect the intention to maintain control of the firm or, if induced by a lock-up period, facilitate the entry of a new blockholder if pre-IPO shareholders such as VC or PE firms are seeking to exit the firm (Anderson et al., 2017).

All continuous variables are winsorised at the 1st and 99th percentiles. Table A.1 provides an overview of all variables.

3.3. Empirical Strategy

To ascertain the impact of employee ownership on IPO underpricing, pooled OLS regressions of the following form are used:

$$Underpricing_{i,j,k,t} = \beta_0 + \beta_1 EO_i + \vec{v}\vec{X}_{i,j,k,t} + \delta_j + \kappa_k + u_{j,t} + \epsilon_{i,j,k,t}, \tag{1}$$

where the indices i, j, k, and t refer to firm, industry, country, and year, respectively. Industries are defined using the Fama-French 12-industries classification. EO describes the measure of employee ownership and $\vec{X}$ is a vector of control variables (see Section 3.2). δ_j and κ_k control for industry and country fixed effects, respectively. As previous studies show potential correlation within industries during 'hot issues' markets, $u_{j,t}$ controls for clustering by industry and year within the error term $\epsilon_{i,j,k,t}$.

The impact of pre-IPO broad-based EO on ownership dispersion is analysed using the following model:

$$Ownership_{i,j,k,t} = \beta_0 + \beta_1 EO_i + \vec{v}\vec{X}_{i,j,k,t} + \delta_j + \kappa_k + u_{j,t} + \epsilon_{i,j,k,t}, \tag{2}$$

where $Ownership$ refers to the measure of post-IPO blockholder ownership.

3.4. Sample descriptives

Due to varying data availability, the sample is split into several panels, presented by Table 1. Panel A, the base panel, includes data on 839 firms for which ex-ante uncertainty and market-based controls were available. Panel B includes the full set of controls. The sample size is reduced to 627 firms, caused by limited data availability on the one hand and the fact that not all IPOs utilise offer price ranges on the other. From Panel A to Panel B, the distribution of variables remains reasonably similar. In Panel A, 32.3 % of firms have broad-based EO. This figure is almost identical at 32.9 % of firms in Panel B.

In order to mitigate concerns that EO firms differ fundamentally from non-EO firms, Panel C restricts the sample to include only those firms that introduce EO at some point in their lifecycle. While the definition of the EO dummy remains the same, a value of 0 implies that the respective firm did not have EO before its IPO, though it did offer EO at a later point in time. Thus, firms that never introduced EO are excluded from this panel. As expected, the proportion of firms with broad-based EO in this panel is higher at 35.9 %. In Panel D, which applies full controls to Panel C, this figure is 37.1 %.

Panels E and F are used for ownership analyses. The mean total outside blockholding is 4.9 % and the largest outside block has a mean of 3.2 %. The latter is below the strategic mark of 5 %. Both figures are similar for corporate blockholders. The mean number of outside (corporate) blockholders is less than one. Panel F utilises a dummy variable indicating EO plans holding at least 5 % of market capitalisation. As this variable provided by EFES only after 2005, the sample size is reduced to 364 firms. Although 33.5 % of firms have pre-IPO broad-based EO in Panel E, only 15.7 % have large EO schemes. The means of ownership variables in this panel are slightly higher than in Panel E.

— Table 1 about here —

Figure 1 illustrates the distribution of sample IPO firms across 19 European states. The majority of firms is from the United Kingdom, followed by France, Germany, and Italy. The coverage relative to all IPOs in Europe in the time period covered is relatively low, which could be explained by the fact that the core sample is based on the firms provided by the EFES institute, which includes only those firms that were alive at some point between 2005 and 2016. A firm with an IPO in 2002 which closed in 2003, for

example, would not appear in the sample. Although both dead and alive firms are included in the sample, with regard to firms that went public during the dotcom bubble but ceased operations due to the pursuant crisis, some survivorship bias is introduced. Further sample reductions were made as a result of data consistency concerns, described in Section 3.1. Nevertheless, I strive to improve the sample's coverage of the European IPO universe in the future.

— Figure 1 about here —

Figure 2 presents sample characteristics over the years covered, 1990-2017. Subfigure 2a shows the number of IPOs per year. The peaks around 1999 and 2006 are indicative of the 'hot issues' markets leading up to the dotcom and global financial crises. Subfigure 2b illustrates the average annual level of underpricing across the sample. Consistent with Subfigure 2a, the highest level of underpricing is discernible around the former of the mentioned 'hot issues' periods. This highlights the need to control for such market conditions.

— Figure 2 about here —

Figure 3 presents the clustering of IPOs and IPO underpricing to industries and years. Subfigure 3a shows the number of IPOs in Panel A by both year and corresponding Fama-French 12 industry. During the dotcom bubble period, a clustering in the business equipment industry is visible. Subfigure 3b illustrates the level of IPO underpricing in the same categories. Again, the dotcom bubble period emerges as a hot issues period, concentrated in a couple of industries. To mitigate the impact of serial correlation by year and industry, the regression analyses cluster the error term accordingly.

— Figure 3 about here —

Examining the point in time at which firms introduce their first EO scheme relative to their IPO, Figure 4 indicates a clear clustering closer to the IPO. A larger number of EO schemes is introduced prior to than after the IPO. Most frequently, EO is first issued in the same year as the IPO. This could be due to the convenience, given the structural changes taking place at this point in time. However, it could also be a strategic attempt to mitigate takeover concerns arising due to the IPO, consistent with the arguments made

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previously. Remarkably, the majority of EO plans first issued in the same year but still before the IPO are broad-based. This is consistent with the hypothesised entrenchment effect, which arises only due to broad-based EO. Even though the number of EO plans issued just after the IPO is also high, these are mainly non-inclusive or executive-only plans. Of all plans issued, except for the period at but still prior to the IPO, a greater portion is non-inclusive prior to the IPO but broad-based after the IPO.

— Figure 4 about here —

4. Results

4.1. The effect of broad-based EO on IPO underpricing

Examining univariate statistics on the treated and control groups, Table 2 reports separate statistics for the main variables. The average underpricing of EO firms is 6.8 %, which is significantly lower than that of non-EO firms at 9.6 %. EO firms in the sample are larger than non-EO firms and are more frequently previous LBO firms and carve-out firms. The highly significant difference in size merits concerns of comparability, which will be addressed in the superseding analyses. For the remaining variables, differences between the two groups of firms are not significant.

— Table 2 about here —

Table 3 shows results of the baseline regressions examining the impact of EO on IPO underpricing. Without controls (Column I), pre-IPO broad-based EO reduces underpricing by -3.3 %. By including ex-ante uncertainty and market-based controls (Column II), the effect is reduced to -2.2 %, but remains robust. In Column III, when full controls are introduced, it decreases to -2.3 %. Overall, a robust negative impact of broad-based EO in line with the hypothesised impact is therefore discernible. The direction of the coefficients of the control variables are as expected, though in the base specification (Column II) only lag of sales and the reverse-LBO dummy have a significant impact. The carve-out dummy is only just insignificant. Surprisingly, having VC-backing has no significant impact on IPO underpricing. When including offer price revision in Column III, the sample is reduced by more than twenty percent and most control variables cease to have a significant impact.

As a robustness test, I repeated the analyses using year fixed effects. As Table B.2 shows, the magnitude and significance of the main explanatory variable remain similar. Nevertheless, most control variables become insignificant. Year fixed effects are excluded from subsequent analyses due to multicollinearity issues with variables assessing time-trends. I argue that macroeconomic time trends are covered by my control variables. Furthermore, year fixed effects are not commonly included in past studies of IPO under-pricing as they are often subsumed by industrial variation (e.g., Aruğaslan et al., 2004).

Addressing concerns of lack of comparability between the treated and control groups arising due to differences in firm size (see Table 2), which could indicate that the presence of EO and reduced impact of underpricing are driven by this difference, I follow Smart and Zutter (2003) and repeat the analyses using a size-matched sample. Every EO firm is matched to a single EO-firm within the same industry that is closest to it in size, reducing the sample from 839 to 430 firms. Any significant differences in the main variables between EO and non-EO firms disappear (see Table C.3). In Table C.4, EO firms underprice less than non-EO firms in all settings, confirming that the impact of EO on underpricing is not merely driven by firm size.

To ascertain whether executive-only EO has a similar effect, I repeat the baseline analyses of Table 3 using only the control group. Now, the treatment variable *EO* equals one if a firm introduced any type of EO, including executive-only EO, prior to its IPO. The results are shown by Table 4. As expected (Fu et al., 2015), no statistically significant impact on underpricing is discernible throughout all specifications. These findings contrast with those of Table 3 and show that only broad-based EO has a meaningful impact on IPO underpricing.

To ensure that any captured effect is not caused by fundamental differences between firms introducing EO at some point in their lifetime and those that never do so, the analyses shown by Table 5 repeat the baseline regressions using only firms of the former type. All firms in these analyses eventually become EO firms. The results remain similar in all specifications. In Column I, EO firms underprice 2.0 % less, compared to 2.2 % less using the full sample (see Table 3). Using full controls, the effect persists. These findings

do not suggest that the effect of EO on underpricing is driven by more fundamental, unobserved differences between EO and non-EO firms.

— Table 5 about here —

4.2. Entrenchment effect of EO

In order to examine reasons for the discovered negative impact of EO on underpricing in line with the hypothesised entrenchment effect, I consider various dimensions of corporate control. First, I focus on a firm's overall ownership dispersion and the presence of blockholders as operationalisations of joint monitoring ability and perceived takeover likelihood. Next, I use the holdings of the largest blockholder as a proxy for monitoring incentives.

4.2.1. Joint monitoring ability and perceived takeover likelihood

Table 6 examines the relation between EO and post-IPO block ownership, measured using the total holding percentage of blockholders with a stake of at least 5 % that are not employed by the firm. Columns I-III utilise the same definition of EO as the previous section, i.e. a dummy indicating the presence of pre-IPO broad-based EO.

Examining first the variable *Total block ownership* (Column I), which also includes those blockholdings that were already in place before the IPO, EO firms experience a 2.7 % reduction. This is economically small, also compared with the mean total blockholdings of 27.4 % (see Panel E of Table 1). Half of this reduction is attributable to new (referred to as 'outside') blockholdings which formed at or after the IPO (Column II). Although the difference between EO and non-EO firms is again economically small at 1.3 %, it represents a third of the mean outside blockholdings. Column III restricts the definition of blockholders further by focusing on corporate blockholders (i.e., non-individuals). The coefficient is almost unchanged, indicating that the reduction in outside blockholdings is focused on those blockholders who are deemed better able to monitor management (Field and Sheehan, 2004). As expected, VC-backing, a prior LBO, and being carved-out increase the percentage held by blockholders while share overhang and firm size have a mitigating (but only minor) effect.

The economically small impact discernible in the preceding analyses could be attributed to the fact that the effectiveness of EO at achieving any entrenching effect depends on its size. Using the data provided by EFES, I redefine the EO dummy to equal

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one if the market capitalisation held by employees is at least 5 % of total market capitalisation. I choose this threshold following Kim and Ouimet (2014), as holdings beyond 5 % can more effectively block takeover attempts. Furthermore, I assume that holdings of at least 5 % can be more reliably identified as this is the typical disclosure threshold.

Columns IV-VI of Table 6 present the results of this adjusted specification. As expected, the negative effect on the different measures of ownership dispersion is increased substantially. Nevertheless, given the mean overall blockholdings of 29.2 % (see Panel F of Table 1), the reduction of 4.2 % (Column IV) can still not be seen as decisive. The reduction in both outside and corporate outside blockholdings of 1.8 % (Columns V-VI) is, again, in itself small. However, compared with the sample mean of 5.7 % (5.5 % for corporate blockholdings), it represents well over a third and close to half of outside blockholdings. Given the similarity of outside and corporate outside blockholdings, only the former is considered in subsequent analyses.

— Table 6 about here —

Table 7 uses the number of blockholdings as a further measure of ownership dispersion. Looking first at the number of overall blockholdings, including pre-IPO blockholdings, the mere presence of EO does not have a significant effect (Column I). Large EO schemes, on the other hand, reduce these blockholdings by $|e^{-0.133} - 1| = 12.5$ % (Column III), though this finding is only weakly significant.

Columns II and IV regard only outside blockholdings. Having EO reduces the number of outside blocks by $|e^{-0.056} - 1| = 5.4$ % (Column II), an economically weak effect that is statistically insignificant. Again, the finding for large EO schemes is more pronounced at $|e^{-0.134} - 1| = 12.5$ % (Column IV). Taken together, it cannot be confirmed that EO reduces the number of outside blockholders.

— Table 7 about here —

As a further augmentation of this analysis, Table D.5 uses a continuous specification of the EO variable, i.e. the percentage of market capitalisation held by employees, as the main explanatory variable. Here, a 1 % increase in EO holdings decreases the total holdings of blockholders by 17.1 % (Column I). Outside blockholdings are reduced by 4.2 % (Column II). The number of (outside) blockholdings is reduced decisively by

approximately 30 % (Columns III-IV). Given that EFES data is extracted from annual reports, which tend to only report holdings above 5 % reliably, this analysis is treated as supplementary.

4.2.2. Monitoring incentive

While the specifications using total shareholdings and number of blockholders can be seen as a measure of capability to replace management, the size of the largest blockholding reflects monitoring incentive (Aruğaslan et al., 2004). Table 8 presents the results of the applicable analysis. A significant reduction in monitoring is only achieved for overall blockholdings, though this reduction is economically small at 2.0 %; whether this meaningfully impacts monitoring ability is questionable. The reduction in the largest outside block is almost negligible and statistically insignificant, even though EO would be expected to defend more against outside monitoring than monitoring of already existing blockholdings.

— Table 8 about here —

Looking at continuous EO as a supplementary analysis (see Table D.5), only the largest outside block is reduced significantly, but merely by 2.2 % (Column VI). A reduction in monitoring as the incentive for using EO can therefore not be confirmed.

Overall, due to the reduction in total (outside) blockholdings, there is evidence for a signalling effect of EO in line with the M&A anticipation hypothesis. Evidence for the reduced monitoring hypothesis is weaker; while the reduction in total blockholdings suggests less effective joint monitoring ability, the absence of a signficant negative effect on the largest blockholder does not suggest a reduced monitoring incentive.

5. Conclusion & Outlook

This paper investigates the impact of broad-based EO on IPO underpricing. Given that both constructs are a form of entrenchment, though IPO underpricing comes at the cost of leaving money 'on the table', I expect that EO firms should experience less underpricing. I explore whether such an effect is in line with Brennan and Franks (1997)'s reduced monitoring hypothesis or the intention of lowering takeover risks, which should act as a signal deterring outside blockholders.

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Using a sample of 839 firms (32.3 % of which have broad-based EO prior to their IPO), I show that EO firms experience 2.2 % less underpricing than non-EO firms. This finding persists in various robustness checks and seems not to be driven by differences in firm size or more fundamental differences between EO and non-EO firms. It suggests that the presence of EO allows a firm to increase its IPO proceeds.

Exploring the mechanism underlying this finding, I use hand-collected ownership data to assess the impact of EO on ownership dispersion. While EO does lower the percentage of shares held by outside blockholders, this reduction is only slight at 1.3 %. For large EO plans, the reduction is higher at 1.8 %, but still economically small. Nevertheless, given that EO firms underprice less and therefore do not ration their shares, the effect is not negligible. Given the even smaller reduction of EO on the size of the largest blockholding, EO is more feasibly a signal of takeover likelihood to investors at the IPO, rather than a tool of monitoring reduction.

As of now, this paper can be regarded as early stage, meaning that I am still working on making improvements. I very much welcome any constructive comments to aid me in this endeavour.

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Table 1: Descriptive sample statistics
This table reports the number of observations (N), mean value (Mean), standard deviation (SD), 25th percentile (p25), median (p50), 75th percentile (p75). For a definition of variables see Table A.1.

	N	Mean	SD	P25	Median	P75
Panel A: all firms, ex-ante uncertainty, market-based controls						
EO: BB	839	0.323	0.468	0.000	0.000	1.000
EO	839	0.722	0.448	0.000	1.000	1.000
Underpricing	839	0.088	0.147	0.000	0.048	0.138
Lag of sales	839	18.459	4.237	17.700	19.269	20.537
30-day industry return	839	0.011	0.058	-0.020	0.016	0.046
30-day NASDAQ return	839	0.009	0.061	-0.018	0.019	0.044
Overhang	839	2.720	3.816	1.092	2.006	3.003
VC-backing	839	0.122	0.327	0.000	0.000	0.000
Reverse-LBO	839	0.212	0.409	0.000	0.000	0.000
Carve-out	839	0.236	0.425	0.000	0.000	0.000
Panel B: all firms, full controls						
EO: BB	627	0.329	0.470	0.000	0.000	1.000
EO	627	0.702	0.458	0.000	1.000	1.000
Underpricing	627	0.076	0.140	0.000	0.040	0.118
Lag of sales	627	19.298	3.021	18.400	19.725	20.767
30-day industry return	627	0.010	0.058	-0.020	0.015	0.045
30-day NASDAQ return	627	0.008	0.063	-0.018	0.018	0.044
Overhang	627	2.480	3.328	1.117	1.980	3.000
VC-backing	627	0.140	0.348	0.000	0.000	0.000
Reverse-LBO	627	0.242	0.429	0.000	0.000	0.000
Carve-out	627	0.255	0.436	0.000	0.000	1.000
Offer price revision	627	-0.015	0.104	-0.070	0.000	0.057
Panel C: EO firms, ex-ante uncertainty, market-based controls						
EO: BB	754	0.359	0.480	0.000	0.000	1.000
EO	754	0.804	0.397	1.000	1.000	1.000
Underpricing	754	0.087	0.147	0.000	0.048	0.134
Lag of sales	754	18.394	4.377	17.613	19.285	20.561
30-day industry return	754	0.010	0.060	-0.021	0.016	0.045
30-day NASDAQ return	754	0.009	0.062	-0.019	0.019	0.045
Overhang	754	2.724	3.983	1.051	1.965	3.000
VC-backing	754	0.130	0.336	0.000	0.000	0.000
Reverse-LBO	754	0.224	0.417	0.000	0.000	0.000
Carve-out	754	0.247	0.431	0.000	0.000	0.000

	N	Mean	SD	P25	Median	P75
Panel D: EO firms, full controls						
EO: BB	556	0.371	0.483	0.000	0.000	1.000
EO	556	0.791	0.407	1.000	1.000	1.000
Underpricing	556	0.073	0.140	0.000	0.040	0.115
Lag of sales	556	19.285	3.162	18.374	19.799	20.808
30-day industry return	556	0.009	0.060	-0.022	0.015	0.044
30-day NASDAQ return	556	0.008	0.064	-0.019	0.018	0.044
Overhang	556	2.487	3.494	1.065	1.927	2.998
VC-backing	556	0.151	0.358	0.000	0.000	0.000
Reverse-LBO	556	0.257	0.437	0.000	0.000	1.000
Carve-out	556	0.272	0.445	0.000	0.000	1.000
Offer price revision	556	-0.016	0.104	-0.074	0.000	0.057
Panel E: Ownership						
EO	792	0.335	0.472	0.000	0.000	1.000
Total block ownership	792	0.274	0.193	0.085	0.299	0.430
Total outside block ownership	792	0.049	0.082	0.000	0.000	0.073
Total corporate outside block ownership	792	0.048	0.079	0.000	0.000	0.072
Number of blocks	792	1.004	0.597	0.693	1.099	1.386
Number of outside blocks	792	0.377	0.515	0.000	0.000	0.693
Number of corporate outside blocks	792	0.373	0.514	0.000	0.000	0.693
Largest block	792	0.183	0.153	0.065	0.146	0.290
Largest outside block	792	0.032	0.051	0.000	0.000	0.060
Largest corporate outside block	792	0.031	0.045	0.000	0.000	0.060
VC-backing	792	0.124	0.329	0.000	0.000	0.000
Reverse-LBO	792	0.220	0.414	0.000	0.000	0.000
Carve-out	792	0.246	0.431	0.000	0.000	0.000
Overhang	792	2.468	2.927	1.054	1.875	3.000
Total assets	792	19.998	1.878	18.634	19.886	21.202
Debt ratio	792	0.206	0.210	0.030	0.166	0.326
Tangibility	792	0.204	0.228	0.028	0.115	0.312
Firm volatility	792	0.024	0.013	0.016	0.021	0.028

	N	**Mean**	**SD**	**P25**	**Median**	**P75**
		Panel F: Ownership from 2005				
EO>5%	364	0.157	0.364	0.000	0.000	0.000
Total block ownership	364	0.292	0.192	0.107	0.321	0.439
Total outside block ownership	364	0.057	0.091	0.000	0.000	0.098
Total corporate outside block ownership	364	0.055	0.084	0.000	0.000	0.097
Number of blocks	364	1.074	0.605	0.693	1.099	1.609
Number of outside blocks	364	0.425	0.540	0.000	0.000	0.693
Number of corporate outside blocks	364	0.420	0.538	0.000	0.000	0.693
Largest block	364	0.190	0.149	0.076	0.153	0.297
Largest outside block	364	0.037	0.059	0.000	0.000	0.067
Largest corporate outside block	364	0.035	0.048	0.000	0.000	0.066
VC-backing	364	0.124	0.330	0.000	0.000	0.000
Reverse-LBO	364	0.261	0.440	0.000	0.000	1.000
Carve-out	364	0.294	0.456	0.000	0.000	1.000
Overhang	364	2.408	3.160	1.060	1.830	2.839
Total assets	364	19.968	1.796	18.711	19.878	21.158
Debt ratio	364	0.207	0.212	0.022	0.167	0.329
Tangibility	364	0.169	0.194	0.021	0.089	0.251
Firm volatility	364	0.023	0.011	0.016	0.021	0.026

Figure 1: Map of observations
This figure shows the number of IPOs per country, based on Panel A.
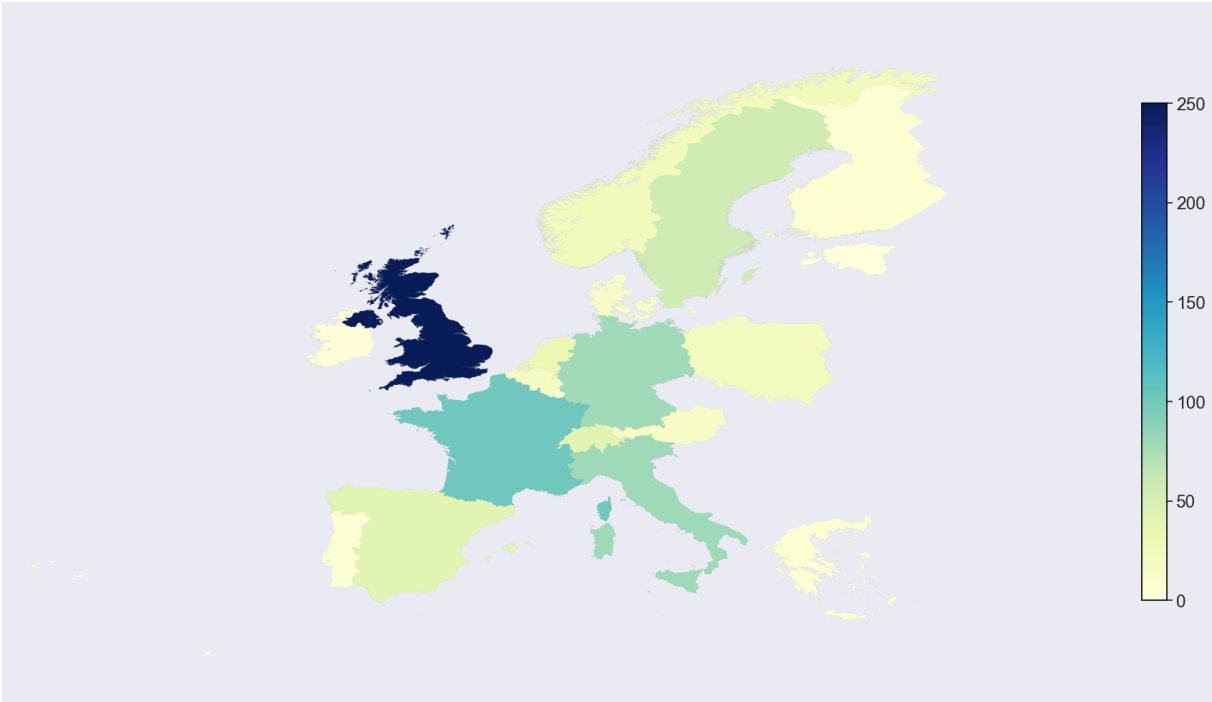
Figure 2: Sample IPO characteristics over time
This figure illustrates the development of sample IPO characteristics over time, based on Panel A. Subfigure (a) presents the frequency of sample IPOs for each sample year, 1990-2017. Subfigure (b) shows the average level of IPO underpricing for those sample years with at least three sample IPOs, 1993-2017.

(a)

(b)
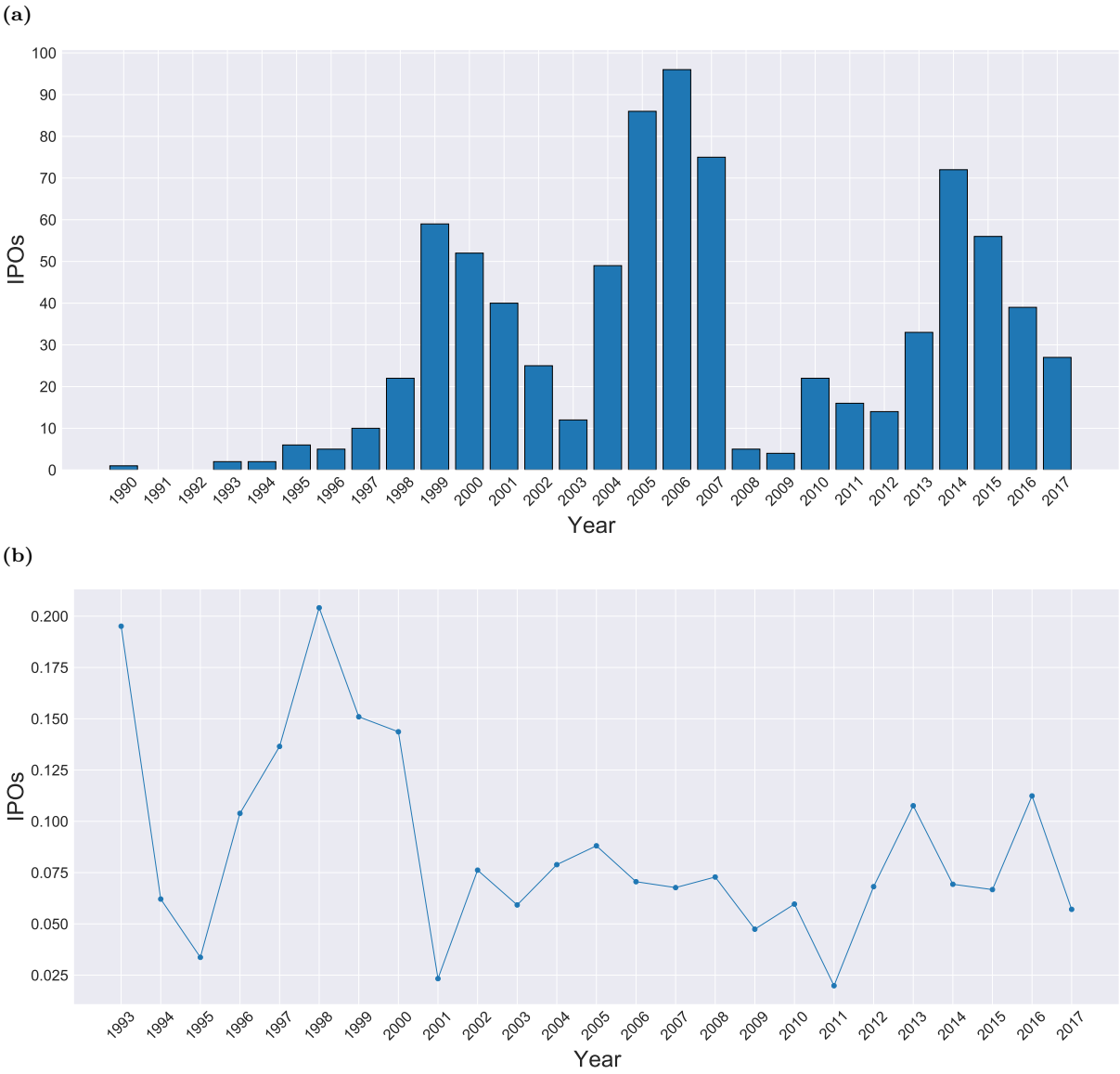
Figure 3: Sample IPO characteristics over time by industry

This figure presents sample IPO characteristics by year and industry, based on the Fama-French 12 industries specification. Subfigure (a) presents the frequency of sample IPOs for each sample year by industry, 1990-2017. Subfigure (b) shows the average level of IPO underpricing by industry for those sample years with at least three sample IPOs, 1993-2017.

(a)

(b)
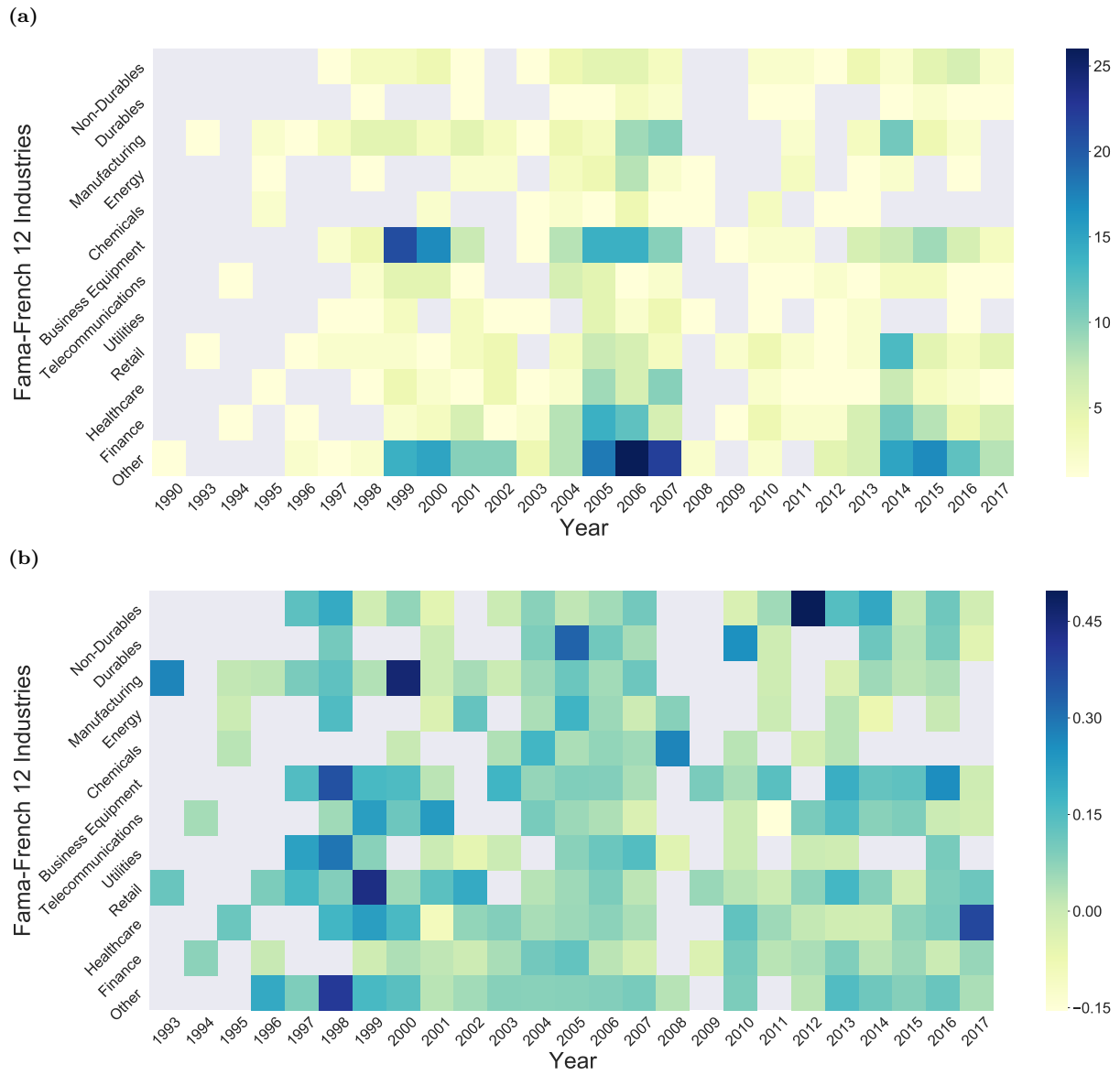
Figure 4: Introduction of first EO scheme relative to IPO
This figure shows the number of firms introducing their first (broad-based) EO scheme at a given number of years prior to or after their IPOs. For instance, the bar at -1 shows the number of firms introducing EO schemes 1 year before the IPO, while the bar at 1 shows the number of firms doing so 1 year after the IPO. The vertical line represents the time of the IPO. As some firms introduced schemes in the same year as the IPO, the bars immediately to the right and left of IPO refer to schemes introduced less than one year but before and after the IPO, respectively. The rightmost and leftmost columns include observations beyond the indicated axis.

Table 2: Univariate sample analysis
Sample means for the main explanatory variable across the two groups of EO (*EO:BB=1*) and non-EO (*EO:BB=0*). A t-test comparing equivalence of sample means is conducted using Huber/White robust standard errors clustered by industry and year. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	EO:BB=0		*EO:BB=1*		
	N	**Mean**	**N**	**Mean**	**Difference**
Underpricing	568	0.097	271	0.067	-0.030***
Lag of sales	568	18.135	271	19.139	1.005***
30-day industry return	568	0.011	271	0.010	-0.001
30-day NASDAQ return	568	0.009	271	0.009	-0.001
Overhang	568	2.842	271	2.465	-0.377
VC-backing	568	0.111	271	0.144	0.033
Reverse-LBO	568	0.188	271	0.262	0.074**
Carve-out	568	0.220	271	0.269	0.049

Table 3: EO and IPO underpricing
The dependent variable measures the percent difference between a firm's first closing price and its offer price. EO is a dummy indicating the presence of broad-based EO prior to the IPO. 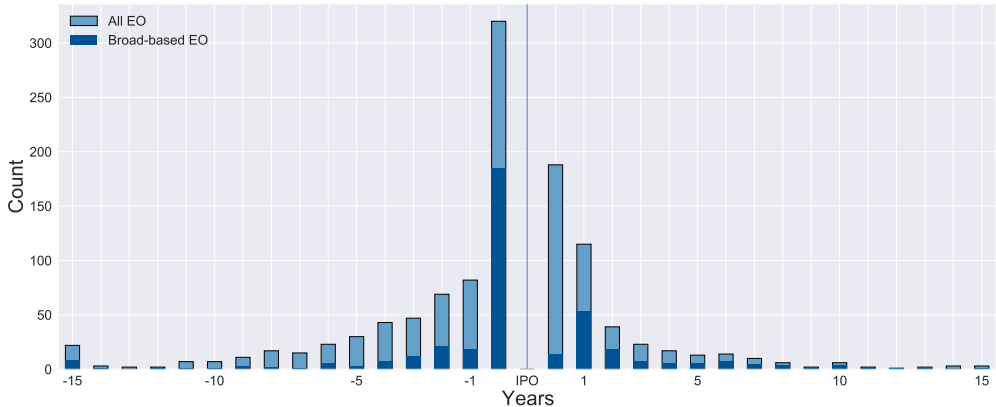Huber/White robust standard errors clustered by industry and year are presented in parentheses. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	I	II	III
	Underpricing	Underpricing	Underpricing
EO: BB	**-0.033***	**-0.022**	**-0.023**
	(0.011)	**(0.011)**	**(0.009)**
Lag of sales		-0.004**	-0.002
		(0.002)	(0.002)
30-day industry return		0.175	0.069
		(0.166)	(0.191)
30-day NASDAQ return		0.239*	0.268
		(0.141)	(0.168)
Overhang		0.000	0.002
		(0.001)	(0.002)
VC-backing		-0.009	0.007
		(0.019)	(0.020)
Reverse-LBO		-0.060**	-0.013
		(0.012)	(0.013)
Carve-out		-0.022**	-0.020*
		(0.010)	(0.011)
Offer price revision			0.324*
			(0.176)
Industry FE	X	X	X
Country FE	X	X	X
N	839	839	627
R^2	0.056	0.103	0.170

Table 4: Executive-only EO and IPO underpricing

The dependent variable measures the percent difference between a firm's first closing price and its offer price. EO is a dummy indicating the presence of executive-only EO prior to the IPO, i.e. those firms that constitute the control group of the analyses conducted in Table 3. Huber/White robust standard errors clustered by industry and year are presented in parentheses. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	I	II	III
	Underpricing	Underpricing	Underpricing
EO: exec-only	**0.001**	**0.006**	**0.021**
	(0.019)	**(0.017)**	**(0.018)**
Lag of sales		-0.005**	-0.003
		(0.002)	(0.003)
30-day industry return		0.136	-0.001
		(0.271)	(0.299)
30-day NASDAQ return		0.328	0.383
		(0.205)	(0.251)
Overhang		0.001	0.002
		(0.001)	(0.002)
VC-backing		0.002	0.019
		(0.027)	(0.029)
Reverse-LBO		-0.030	-0.018
		(0.019)	(0.019)
Carve-out		-0.019	-0.016
		(0.013)	(0.015)
Offer price revision			0.268
			(0.219)
Industry FE	X	X	X
Country FE	X	X	X
N	568	568	420
R^2	0.045	0.098	0.162

Table 5: EO and IPO underpricing: EO firms only
The sample is restricted to include only those firms that introduce any type of EO at some point in their lifetime, even if this is after the IPO. The dependent variable measures the percent difference between a firm's first closing price and its offer price. EO is a dummy indicating the presence of broad-based EO prior to the IPO. Huber/White robust standard errors clustered by industry and year are presented in parentheses. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	I	II
	Underpricing	Underpricing
EO: BB	**-0.020***	**-0.023****
	(0.011)	**(0.010)**
Lag of sales	-0.004**	-0.002
	(0.002)	(0.002)
30-day industry return	0.241	0.113
	(0.168)	(0.205)
30-day NASDAQ return	0.213	0.272
	(0.153)	(0.186)
Overhang	0.000	0.002
	(0.001)	(0.002)
VC-backing	-0.011	0.004
	(0.020)	(0.022)
Reverse-LBO	-0.031**	-0.017
	(0.013)	(0.014)
Carve-out	-0.022*	-0.022**
	(0.011)	(0.011)
Offer price revision		0.283
		(0.195)
Industry FE	X	X
Country FE	X	X
N	754	556
R^2	0.109	0.164

Table 6: EO and Total Blockholdings

This table reports regression results of EO on various measures of outside blockholdings. In Columns I-III, EO is a dummy indicating the presence of broad-based EO prior to the IPO. Columns IV-VI redefine EO as a dummy variable indicating the presence of a broad-based EO plan holding at least 5 % of total market capitalisation in the year prior to the IPO. The dependent variables utilise the sum of all blockholdings expressed as a percentage of total shares. *Total block ownership* defines blockholders as those shareholders holding at least 5% of shares who are not employed by the firm though they can already have owned shares prior to the IPO. *Total outside block ownership* is defined analogously, with the added restriction that the blockholder must not be mentioned on the prospectus. *Total corporate outside block ownership* further restricts the definition of blockholders to exclude individuals or trusts held on behalf of an individual. All dependent variables are transformed using the natural logarithm ($ln(x+1)$). Huber/White robust standard errors clustered by industry and year are presented in parentheses. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	EO: BB			*EO≥5%*		
	Total block ownership	Total outside block ownership	Total corporate outside block ownership	Total block ownership	Total outside block ownership	Total corporate outside block ownership
	I	II	III	IV	V	VI
EO	**-0.027***	**-0.013****	**-0.012****	**-0.042***	**-0.018***	**-0.018***
	(0.014)	**(0.005)**	**(0.005)**	**(0.025)**	**(0.010)**	**(0.010)**
VC-backing	0.069***	0.023*	0.016*	0.099***	0.041*	0.028*
	(0.021)	(0.012)	(0.009)	(0.026)	(0.022)	(0.017)
Reverse-LBO	0.043**	0.033***	0.033***	0.038	0.030**	0.031***
	(0.018)	(0.008)	(0.007)	(0.024)	(0.012)	(0.011)
Carve-out	0.010	0.027***	0.022***	0.023	0.025**	0.015*
	(0.018)	(0.007)	(0.007)	(0.025)	(0.010)	(0.009)
Overhang	0.003	-0.003**	-0.003***	0.009***	-0.003*	-0.004**
	(0.003)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Total assets	-0.003	-0.006***	-0.006***	-0.005	-0.007***	-0.006**
	(0.005)	(0.002)	(0.002)	(0.007)	(0.003)	(0.003)
Debt ratio	0.123***	0.013	0.010	0.124**	0.015	0.008
	(0.036)	(0.019)	(0.019)	(0.047)	(0.032)	(0.031)
Tangibility	-0.031	0.020	0.014	-0.028	0.034	0.024
	(0.038)	(0.014)	(0.015)	(0.077)	(0.026)	(0.025)
Firm volatility	0.482	-0.200	-0.274	2.243**	-0.027	-0.220
	(0.634)	(0.216)	(0.212)	(0.972)	(0.462)	(0.434)
Industry FE	X	X	X	X	X	X
Country FE	X	X	X	X	X	X
N	792	792	792	364	364	364
R^2	0.102	0.219	0.219	0.208	0.224	0.197

Table 7: EO and Number of Blockholdings

This table reports regression results of EO on the number of blockholdings. In Columns I-II, EO is a dummy indicating the presence of broad-based EO prior to the IPO. Columns III-IV redefine EO as a dummy variable indicating the presence of a broad-based EO plan holding at least 5 % of total market capitalisation in the year prior to the IPO. The dependent variables utilise the number of blockholdings. *Number of blocks* defines blockholders as those shareholders holding at least 5% of shares who are not employed by the firm though they can already have owned shares prior to the IPO. *Number of outside blocks* is defined analogously, with the added restriction that the blockholder must not be mentioned on the prospectus. All dependent variables are transformed using the natural logarithm $(ln(x+1))$. Huber/White robust standard errors clustered by industry and year are presented in parentheses. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	EO: BB		EO≥5%	
	Number of blocks	Number of outside blocks	Number of blocks	Number of outside blocks
	I	II	III	IV
EO	**-0.059**	**-0.056**	**-0.133***	**-0.134**
	(0.042)	**(0.038)**	**(0.080)**	**(0.081)**
VC-backing	0.368***	0.102	0.410***	0.130
	(0.062)	(0.062)	(0.084)	(0.102)
Reverse-LBO	0.175***	0.221***	0.123*	0.189***
	(0.048)	(0.046)	(0.074)	(0.070)
Carve-out	-0.002	0.159***	0.014	0.163***
	(0.051)	(0.041)	(0.074)	(0.055)
Overhang	-0.007	-0.024***	0.003	-0.029**
	(0.007)	(0.008)	(0.008)	(0.013)
Total assets	-0.061***	-0.042***	-0.061***	-0.050***
	(0.014)	(0.010)	(0.022)	(0.018)
Debt ratio	0.408***	0.092	0.376**	0.131
	(0.100)	(0.124)	(0.146)	(0.197)
Tangibility	-0.168	0.107	-0.018	0.220
	(0.108)	(0.089)	(0.181)	(0.160)
Firm volatility	-1.125	-1.620	1.734	-0.522
	(1.941)	(1.583)	(2.728)	(3.156)
Industry FE	X	X	X	X
Country FE	X	X	X	X
N	792	792	364	364
R^2	0.227	0.217	0.229	0.214

Table 8: EO and Largest Blockholding

This table reports regression results of EO on the largest blockholding. In Columns I-II, EO is a dummy indicating the presence of broad-based EO prior to the IPO. Columns III-IV redefine EO as a dummy variable indicating the presence of a broad-based EO plan holding at least 5 % of total market capitalisation in the year prior to the IPO. The dependent variables utilise the percent holding of the largest blockholder. *Largest block* defines blockholders as those shareholders holding at least 5% of shares who are not employed by the firm though they can already have owned shares prior to the IPO. *Largest outside block* is defined analogously, with the added restriction that the blockholder must not be mentioned on the prospectus. All dependent variables are transformed using the natural logarithm ($ln(x+1)$). Huber/White robust standard errors clustered by industry and year are presented in parentheses. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	EO: BB		EO≥5%	
	Largest block	Largest outside block	Largest block	Largest outside block
	I	II	III	IV
EO	**-0.020***	**-0.004**	**-0.012**	**-0.006**
	(0.012)	**(0.004)**	**(0.023)**	**(0.007)**
VC-backing	-0.000	0.017*	0.021	0.029*
	(0.015)	(0.010)	(0.021)	(0.016)
Reverse-LBO	0.026*	0.015***	0.024	0.011*
	(0.014)	(0.004)	(0.019)	(0.006)
Carve-out	0.013	0.015***	0.027	0.019***
	(0.014)	(0.005)	(0.019)	(0.007)
Overhang	0.003	-0.001	0.007***	-0.001
	(0.002)	(0.001)	(0.002)	(0.001)
Total assets	0.005	-0.003***	0.004	-0.004***
	(0.004)	(0.001)	(0.006)	(0.001)
Debt ratio	0.062**	0.010	0.065	0.006
	(0.030)	(0.010)	(0.043)	(0.017)
Tangibility	0.004	0.016*	0.017	0.035**
	(0.030)	(0.009)	(0.056)	(0.016)
Firm volatility	0.758	-0.075	1.791**	0.113
	(0.503)	(0.136)	(0.782)	(0.295)
Industry FE	X	X	X	X
Country FE	X	X	X	X
N	792	792	364	364
R^2	0.082	0.204	0.164	0.249

Appendix A. List of Variables

Table A.1: List of Variables
This table presents a list and definition of the variables used within this paper.

Variable	Description
Main Variables	
EO: BB	Dummy equal to 1 if broad-based EO entailing equity participation was introduced prior to the IPO.
EO	Dummy equal to 1 if any (also executive-only) EO entailing equity participation was introduced prior to the IPO.
EO$\geq$5%	Dummy equal to 1 if firm had broad-based EO plan holding at least 5 % of total market capitalisation prior to the IPO.
Underpricing	Percent change between firm's IPO offer price and its first closing price: $\frac{First\ closing\ price - Offer\ price}{Offer\ price}$.
Total (corporate) outside block ownership	Natural logarithm $(ln(x+1))$ of the sum of all blockholdings expressed as the percentage of total shares. The *corporate* specification of this variable disregards blockholdings held by individuals or trusts on behalf of individuals.
Largest (corporate) outside block	Natural logarithm $(ln(x+1))$ of the largest percent (corporate) blockholding. The *corporate* specification of this variable disregards blockholdings held by individuals or trusts on behalf of individuals.
Number of (corporate) outside blocks	Natural logarithm $(ln(x+1))$ of the number of (corporate) blockholdings exceeding 5% of total shares. The *corporate* specification of this variable disregards blockholdings held by individuals or trusts on behalf of individuals.
Underpricing control variables	
Lag of sales	Natural logarithm $(ln(x+1))$ of net sales (in USD) in the financial year preceding a firm's IPO, control for ex-ante uncertainty.
30-day industry return	Continuous 30-day return of Fama-French 48 industries, using data from Kenneth French. Control for industry information spillovers.
30-day NASDAQ return	Continuous 30-day NASDAQ return, control for bull markets.
Overhang	Ratio of shares retained to shares offered, control for wealth gains incurred by IPO underpricing: $\frac{Shares\ retained}{Shares\ offered}$, where *Shares retained = Pre–IPO shares outstanding − Secondary shares offered.*.
VC-backing	Dummy equal to 1 if firm has venture capital backing.
Reverse-LBO	Dummy equal to 1 if firm was subject to a leveraged buy-out.
Carve-out	Dummy equal to 1 if IPO corresponds to a carve-out.
Offer price revision	Percent difference between offer price and mean of indicative price range, control for investor information: $\frac{Offer\ price - Mean\ filing\ range}{Mean\ filing}$, where *Mean filing* $= \frac{Offer\ price\ range\ high + Offer\ price\ range\ low}{2}$.

Variable	Description
Ownership control variables	
Total assets	Natural logarithm ($ln(x+1)$) of total assets (in USD) in the financial year succeeding a firm's IPO, control for firm size.
Debt ratio	Ratio of book debt to book equity, control for leverage.
Tangibility	Ratio of fixed (i.e., property, plant, equipment) to total assets, control for agency costs.
Firm volatility	Standard deviation of returns in the year after the IPO, control for volatility.

Appendix B. Robustness test with year fixed effects

Table B.2: EO and IPO underpricing including year fixed effects
The dependent variable measures the percent difference between a firm's first closing price and its offer price. EO is a dummy indicating the presence of EO prior to the IPO. Huber/White robust standard errors clustered by industry and year are presented in parentheses. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	I	II	III	IV
	Underpricing	Underpricing	Underpricing	Underpricing
	EO: BB	*EO: BB*	*EO: BB*	*EO:BB*
EO: BB	**-0.031***	**-0.022**	**-0.023**	**-0.024**
	(0.011)	**(0.011)**	**(0.010)**	**(0.011)**
Lag of sales		-0.003**	-0.001	-0.003*
		(0.002)	(0.002)	(0.002)
30-day industry return		0.213	0.075	
		(0.175)	(0.191)	
30-day NASDAQ return		0.188	0.264	
		(0.173)	(0.188)	
Overhang		-0.000	0.002	-0.000
		(0.001)	(0.002)	(0.001)
VC-backing		0.002	0.018	0.004
		(0.020)	(0.021)	(0.019)
Reverse-LBO		-0.023*	-0.008	-0.022*
		(0.013)	(0.014)	(0.013)
Carve-out		-0.020	-0.014	-0.020
		(0.014)	(0.015)	(0.014)
Offer price revision			0.291	
			(0.187)	
Industry FE	X	X	X	X
Country FE	X	X	X	X
Year FE	X	X	X	X
N	838	838	626	838
R^2	0.114	0.150	0.212	0.132

Appendix C. Robustness test with size-matched control group

Table C.3: Univariate size-matched sample analysis
Sample means for the main explanatory variable across the two groups of EO (*EO:BB=1*) and non-EO (*EO:BB=0*) of the size-matched sample. A t-test comparing equivalence of sample means is conducted using Huber/White robust standard errors clustered by industry and year. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

| | *EO:BB=0* | | *EO:BB=1* | | |
	N	Mean	N	Mean	Difference
Underpricing	177	0.083	255	0.066	-0.016
Lag of sales	177	19.592	255	19.637	0.046
30-day industry return	177	0.011	255	0.010	-0.001
30-day NASDAQ return	177	0.010	255	0.010	-0.000
Overhang	177	2.792	255	2.431	-0.361
VC-backing	177	0.113	255	0.141	0.028
Reverse-LBO	177	0.220	255	0.271	0.050
Carve-out	177	0.254	255	0.286	0.032

Table C.4: EO and IPO underpricing: size-matched sample
This table repeats the regression analyses of Table 3 using the size-matched sample. The dependent variable measures the percent difference between a firm's first closing price and its offer price. EO is a dummy indicating the presence of broad-based EO prior to the IPO. Huber/White robust standard errors clustered by industry and year are presented in parentheses. ***, ** and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	I	II	III
	Underpricing	Underpricing	Underpricing
	EO: BB	*EO: BB*	*EO: BB*
EO	**-0.025***	**-0.024****	**-0.033*****
	(0.013)	**(0.012)**	**(0.012)**
Lag of sales		-0.003	-0.001
		(0.003)	(0.004)
30-day industry return		0.246	0.294
		(0.171)	(0.199)
30-day NASDAQ return		0.239*	0.107
		(0.124)	(0.125)
Overhang		0.000	0.000
		(0.001)	(0.001)
VC-backing		-0.009	0.006
		(0.018)	(0.018)
Reverse-LBO		-0.038***	-0.014
		(0.013)	(0.012)
Carve-out		-0.013	-0.010
		(0.014)	(0.014)
Offer price revision			0.460***
			(0.070)
Industry FE	X	X	X
Country FE	X	X	X
N	430	430	341
R^2	0.092	0.155	0.304

Table D.5: Continuous EO and Ownership

This table repeats the regression analyses of Tables 6, 7, and 8 by redefining the main explanatory variable as a continuous variable expressing the percent of total market capitalisation held by a broad-based EO plan in the year prior to the IPO. Columns I-II, III-IV, and V-VI utilise the sum of all blockholdings expressed as a percentage of total shares, the number of blockholdings, and the percent holding of the largest blockholder, respectively. Columns I, III, and V define blockholders as those shareholders holding at least 5% of shares who are not employed by the firm and are not mentioned on the prospectus. Columns II, IV, and VI add the restriction that the shareholder must not be an individual or trust held on behalf of an individual. All dependent variables are transformed using the natural logarithm ($ln(x+1)$). Huber/White robust standard errors clustered by industry and year are presented in parentheses. ***, **, and * indicate significance on the 1%-, 5%- and 10%-levels, respectively. For a definition of variables see Table A.1.

	Total block ownership	Total outside block ownership	Number of blocks	Number of outside blocks	Largest block	Largest outside block
	I	II	III	IV	V	VI
EO	-0.171***	-0.042**	-0.455*	-0.357**	-0.078	-0.022*
	(0.059)	(0.020)	(0.226)	(0.150)	(0.048)	(0.012)
VC-backing	0.084***	0.023	0.365***	0.048	0.013	0.018
	(0.024)	(0.017)	(0.073)	(0.094)	(0.019)	(0.013)
Reverse-LBO	0.052**	0.032***	0.142**	0.183***	0.033*	0.010*
	(0.022)	(0.012)	(0.068)	(0.068)	(0.018)	(0.006)
Carve-out	0.011	0.024***	-0.016	0.153***	0.021	0.018**
	(0.023)	(0.009)	(0.068)	(0.051)	(0.018)	(0.007)
Overhang	0.008***	-0.004**	0.002	-0.029**	0.006***	-0.001
	(0.003)	(0.002)	(0.008)	(0.012)	(0.002)	(0.001)
Total assets	-0.001	-0.007***	-0.055**	-0.046***	0.007	-0.004***
	(0.006)	(0.002)	(0.021)	(0.017)	(0.005)	(0.001)
Debt ratio	0.100**	0.006	0.328**	0.063	0.051	0.005
	(0.047)	(0.033)	(0.143)	(0.201)	(0.041)	(0.016)
Tangibility	-0.043	0.033	-0.049	0.223	0.007	0.036**
	(0.072)	(0.025)	(0.172)	(0.160)	(0.054)	(0.015)
Firm volatility	2.269**	-0.108	0.946	-1.207	2.041***	0.039
	(0.939)	(0.467)	(2.639)	(3.126)	(0.770)	(0.286)
Industry FE	X	X	X	X	X	X
Country FE	X	X	X	X	X	X
N	413	413	413	413	413	413
R^2	0.209	0.213	0.228	0.203	0.171	0.228