The Determinants of IPO Withdrawal - Evidence from Europe

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Abstract

Why do companies, having filed for an IPO and incurred the costs thereof, not follow through? We investigate this by examining all common stock IPO's for the largest countries in Europe over the 2001-2015 period, covering more than 80% of the Western European IPO market by number and value. We identify key characteristics that influence the probability of withdrawal. Negative signals include venture capital or private equity involvement, the presence of negative news or the intent to retire debt. A number of these are in contrast to previous, US based, research, which highlights the importance of institutional and legal characteristics in research replication for Europe.

Keywords: Integration, Initial Public Offering, Europe, Withdrawal, Probit

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1. Introduction

Arguably one of the most important decisions in a company's life cycle is the decision to go public, to launch an initial public offering (IPO). [2]

Despite clearly understood benefits, there are costs to the decision to pursue an initial public offering. It is well accepted that the overt and hidden costs of going public - increased oversight, increased scrutiny etc - can act as a significant deterrent to IPOs (Bessler et al., 2017).

Identifying information asymmetries during the price discovery process, potential investors and IPO insiders might come to diverging IPO valuations. Owen-Smith et al. (2015) argue that this process is influenced by a composition of status signalling as well as a combination of resource and information transfer. The IPO company together with the underwriter is thus trading-off the costs and benefits of the optimal level of information revelation so as to increase the accuracy of price discovery (Sherman and Titman, 2002).

The issuer always reserves an option to change course at any time and withdraw the IPO before its completion. Particularly when the ex-ante uncertainty around a firm value is high, the propensity for negative information perception by investors is higher and as a consequence likewise for withdrawal (Busaba et al., 2001). As Boeh and Dunbar (2013) note, an IPO withdrawal can be a positive as well as a negative event. If the issuer has a superior option for cashing out or otherwise obtaining objectives, compared

[2]The decision to go public has been thoroughly researched and it is suggested that an IPO is undertaken to finance future endeavours when gaining access to the equity market (Benninga et al., 2005). While exploiting temporary favourable overvaluation, companies may go public to adjust their capital structure (Baker and Wurgler, 2002). The successful IPO company can increase its publicity as well as reputation and in consequence enhance firm value. Also, an IPO can represent an attractive exit for insiders such as for venture capitalists and facilitate future acquisition activity (Brau and Fawcett, 2006). Bancel and Mittoo (2009) argue that, once public, the company is exposed to outsider monitoring which is considered a substantial benefit by European companies.

to an IPO, the withdrawal can be a positive. Having withdrawn, a company can reissue. Research has however shown that an IPO withdrawal is negatively priced into a retry value and probability of a second time round IPO. Dunbar (1998) and Lian and Wang (2012) find that issuers withdrawing their IPO are mostly unlikely to return.

To date the determinants of an IPO withdrawal remain opaque - especially in Europe. How can we understand the puzzles around initial public offerings if we are unaware of 12% of the pieces? These 12% represent the approximated IPO withdrawal rate in Europe represented by a sample of 2808 IPO filings in France, Germany, Italy, Spain, Scandinavia and the United Kingdom that have filed for an IPO during 2001 and 2015. In contrast to the USA where the withdrawal rate is closer to 20%, in Europe only a few large capital markets attract IPOs.

. This paper therefore aims to advance research in three areas. First, we document for the first time the extent of IPO withdrawal vs listing for the main European countries. Second, we extent the existing US based literature, both geographically as noted and also by including a variety of hand collected variables and variables not previously considered in the determination of the withdrawal decision. Third, having surfaced a number of findings that are at variance with the existing literature we deploy a battery of robustness checks not heretofore used in this literature, with the main findings remaining solid.

We find that venture capital (VC) and private equity (PE) involvement significantly *increases* the likelihood of withdrawal which is in stark contrast to previous findings in the USA (Dunbar and Foerster, 2008). We find that the intent to retire debt with the IPO proceeds also significantly *increases* the probability of withdrawal. A larger firm size *decreases* the probability of withdrawal, whereas a larger offer size *increases* same. Most companies that withdraw blame unfavourable market conditions. Here we identify IPO offer characteristics to be the main driver of IPO withdrawal. Given the empirical

evidence we hypothesise that the costs to mimic good firm's signals or to drown out negative signals lead companies in the last instance to withdraw their IPO. Issuers that face negative news prior to their IPO are more likely to withdraw. When insiders agree on longer lock-up periods as well as a higher board independence or disclose intellectual capital, issuers are more likely to follow through with the IPO. Also, a higher level of Rule of Law in the country decreases the probability of IPO withdrawal.

The remainder of the paper is structured as follows. In section 2 the factors influencing IPO withdrawal are described. In section 3 the modeling approach as well as the dataset are introduced. The descriptive statistics and empirical evidence for the determinants of IPO withdrawals from analysing market and firm level data are presented in section 4. Finally, the paper is concluded with a brief summary and discussion about the implication of this research.

2. Factors Influencing IPO Withdrawal

The valuation of an IPO company is influenced by a variety of firm and non-firm specific characteristics (Allen and Faulhaber, 1989). As Benveniste et al. (2002) argue, the IPO marks the most important public information event in the company's life cycle, opening a two-way information channel. Using their framework of information revelation theory, signals in general decrease a priori uncertainty about the success of an IPO company. While strong, positive signals such as *certification* increase the aggregate demand for the IPO firm's shares, negative ones decrease same (Brau and Fawcett, 2006). Chemmanur and Fulghieri (1999) argue that companies that face higher uncertainty intrinsically are more difficult to value and therefore have higher evaluation costs. However, not all the companies trying to go public are successful, as the equilibrium offer price is noisy. Potential investors value the IPO company based on a *probability* of future success derived from a network of strong and weak positive as well as negative signals represented

by firm and non-firm characteristics (Owen-Smith et al., 2015).

According to Rock (1986) information can be revealed directly through the IPO prospectus or indirectly through price. In consequence, the IPO company can (falsely) signal the unobservable quality to the potential investor via observable proxies in the IPO prospectus or during the bookbuilding process for instance (Connelly et al., 2010).[3] While the IPO company and the underwriter trade-off the benefits and costs of information revelation (Sherman and Titman, 2002). The IPO company remains private if the potential investors incur significant information acquisition costs (Allen and Faulhaber, 1989). Edelen and Kadlec (2005) argue that underpricing an IPO decreases the probability of IPO withdrawal, where the issuer henceforth must trade-off the proceeds from the underpriced IPO against the probability of IPO withdrawal. This implies that IPOs are withdrawn when the equilibrium offer price is below a certain issuer's fundamental value threshold (Chemmanur and Fulghieri, 1999).

As outlined in Figure 6, firms withdraw for a variety of reasons (Boeh and Dunbar, 2013). A clear complication in evaluating IPO withdrawals is therefore intent. Over the last decade it has become more common for companies to operate a "dual track" approach (Field and Karpoff, 2002, Ewens and Farre-Mensa, 2017), and more recently Aktas et al. (2017) and Greene (2016) whereby concurrent with the IPO filing trade sale opportunities are also sought. In most cases the existence of a dual tracking approach is only observable ex post, typically defined as an instance whereby a withdrawn IPO is sold in a trade sale within one year of the withdrawal. The post withdrawal experience of IPO candidates has received limited attention. Much of this research has been in the areas of entrepreneurial finance, with papers such as Brau et al. (2010), Field and Karpoff (2002). More recent work

[3]Literature on the IPO bookbuilding process in terms of information revelation cast doubt in the actual information production during same in Europe (Jenkinson and Jones, 2004).

begins to evaluate the afterlife of withdrawn firms, surfacing the determinants of different post-withdrawal outcomes (see Boeh and Dunbar (2013)). Of course, prior to evaluation of a taxonomy of post withdrawal events it is necessary to lay groundwork in terms of numbers and determinants of withdrawals, as we do here.

An emerging literature tests the determinants on the decision to withdraw, starting with Busaba et al. (2001). This is extended by Dunbar and Foerster (2008) who broadens the set of possible market and firm level explanatory variables. From these and other papers we can derive and identify a number of factors which may be relevant in the IPO withdrawal phenomenon. Details of the measures used to proxy these features are contained in Table 1. We can break the characteristics hypothesised to impact the IPO withdrawal into a number of larger sets representing market, firm and offer characteristics.

Market characteristics can be broken into three subcategories. First, we consider the level of *regulatory environment* approximated by measures of the Rule of Law, Regulatory Efficiency as well as the Market Openness Index provided by the Heritage Foundation as well as a common law jurisdiction dummy variable. La Porta et al. (1997) suggest that a higher level of political stability as well as legal framework can be considered as a favourable environment for investors. As the regulatory environment influences the uncertainty prior to an IPO (Engelen and van Essen, 2010), we expect that a better environment decreases the probability of withdrawal. Second, we use the change in the country's Gross Domestic Product (dGDP), the monthly yield for the ten-year government bond, and the credit spread to represent the (credit) *economic conditions* (Bergbrant et al., 2015). Third, we examine equity *market conditions* since a multiplicity of research on market timing suggests that companies go public given favourable market conditions, exploiting investor sentiment (Lowry, 2003). The change in the main stock market index (dINDEX) likewise signals positive information spill-

overs for potential issues. Since IPOs tend to come in waves, we examine a hotness dummy (Chemmanur and He, 2011). Recent research on market sentiment supports that (negative) news affects stock returns (Shi et al., 2016).[4] Finally, we introduce the market estimate of volatility (VIX) to further approximate the investor sentiment.

Firm characteristics can be categorized into three areas. First, the *offer characteristics* include the offer size and the intent to retire debt with the IPO proceeds. We anticipate that a proposal to use IPO proceeds for debt retirement is a negative signal and increases the risk for the investor (Busaba et al., 2001). Krigman et al. (2001) identify the underwriter reputation as vital to the success of issues which is supported by the findings of Busaba et al. (2001), Dunbar and Foerster (2008), Boeh and Southam (2011). Another characteristic included is venture capital involvement. We additionally include private equity involvement since previous research has not differentiated same. Research findings are not unanimous. Busaba et al. (2001) find that VC-backed companies that withdrew their IPO were less likely to succeed in a second-time IPO. While Boeh and Southam (2011) find that venture capitalists are more inclined to withdraw an IPO. In contrast, Dunbar and Foerster (2008) identify venture capitalist involvement as key for a successful return to the equity market due to its significant, positive certification. Considering the ineffective certification of VC in, for example, France (Chahine and Filatotchev, 2008) combined with the fragmented European market for risk capital, we query this proposition (Goergen et al., 2009, Groh et al., 2010). Finally, as Chemmanur and Fulghieri (1999) hypothesise, cost of information production is essential in the IPO process. IPO insiders need to trade-off the benefit from disclosing relevant

[4]The negative terms defined by the Lexis Nexis Negative News Search. The code in the different languages is available upon request. `http://help.lexisnexis.com/tabula-rasa/lninexis/searchnegativecompanyinfo_hdi-task?lbu=GB&locale=es_ES&audience=business`

information to potential investors to the costs of doing so. Drawing from this framework, higher disclosure of the company's intangible assets or competitive advantage reduces the information asymmetry between issuer and potential investor.[5] This is denoted as intellectual capital disclosure in the IPO prospectus (IC dummy) in our analysis (Singh and van der Zahn, 2007).

Second, the *firm characteristics* include the firm size and age as we expect that larger and older issuers reduce the uncertainty about the long-term success of the IPO issue through positive signalling (Brau and Fawcett, 2006, Engelen and van Essen, 2010). We also include variables for a higher level of capital expenditure and net income (Lowry, 2003). Barry and Mihov (2015) state that financial intermediaries involvement such as bank debt-financing provides information to the investor and consequently reduces the uncertainty about the firm value prior to the IPO. However, we propose a negative signal of debt to investors as companies with too high a degreee of leverage might also face costs of financial distress which increases the risk to investors. In addition, we suggest that the level of uncertainty prior to the IPO for high-tech companies will typically be more pronounced due to greater uncertainty in IPO issue valuation (Engelen and van Essen, 2010). Lastly, we expect more multinational companies to be perceived as less risky by investors due to the inherent operational hedge conferred by multinationality.

Third, the decision to undertake an initial public offering boosts potential agency problems as the ownership is dispersed. Consequently, we include *Corporate Governance characteristics*. Investors are likely to demand signals that reduce possible agency issues. To proxy these, the level of retained ownership by shareholders prior to IPO, the lock-up period, the board size and independence, the proportion of female board members as well as the CEO duality role are presumed to influence the probability of IPO with-

[5]Patent quality and extant is discussed comprehensively in Bessler and Bittelmeyer (2008), who shows positive valuation and financing effects.

drawal (Howton et al., 2001, Djerbi and Anis, 2015, Brav and Gompers, 2003, McGuiness, 2016). A more detailed description of the variables can be found in Table 1.

3. Methods and Data

As is common we employ a probit model to identify the determinants of IPO withdrawals (Dunbar and Foerster, 2008, Busaba et al., 2001). We apply a binary model, where the dependent variable is 1 if the IPO is withdrawn and 0 otherwise. This paper examines all IPO filings in France, Germany, Italy, Spain, Scandinavia and the UK from January 2001 until December 2015. [6] Following usual practice in IPO literature (Ritter, 1987), we examine all common stock IPOs and therefore exclude Real Estate Investment Trusts (REITs), American Depositary Receipts (ADRs), closed-end or mutual funds, special purpose entities and rights issuance. Unlike other studies financial companies remain in the sample.[7] We use public sources such as Bloomberg or Thomson Reuters for much data but hand collect multiple variables from IPO prospectuses for most. Our data and sources are described in more detail in Table 1.

Our data frame consists of a total of 2808 companies that filed for an IPO from 2001 to 2015 of which 2474 were successful and listed whereas 334 (11.89%) withdrew their IPO. Our dataset covers 82% of the Western European IPO market (see Figure 2). The majority of IPO filings in number and volume are in the UK given the Alternative Investment Market with 1454 successful and 147 withdrawn IPOs overall (about 50% of sample), followed by France and then Germany. We commence in 2001 for two reasons. First,

[6] Throughout the modeling process we tested for endogeneity in our estimates. We do not show these results here, for space reasons. Results are available on request but in no case was endogeneity an issue.

[7] As a robustness check we excludes financial and state-owned enterprises from the sample. Our findings remained broadly unchanged. Results are available on request.

this provides us with a sample period post the dot.com period yet covering at least two full economic cycles in Europe. Second given the significant changes in regulation, European integration, and corporate governance we felt that moving back into the 1990s and beyond would result in a dataset of considerably greater than needed heterogeneity.

There is considerable variation in the level of European IPOs as depicted in Table 2. The wave like nature of IPO's over time is evident here. The number of companies that file for an initial public offering were highest between 2004 and 2007 with a peak of 366 IPO filings in 2005. In contrast, after the global financial crisis erupted in 2007, there were as low as 18 filings in all countries together in 2009. In terms of IPO withdrawals, Europe is characterised by high variation, too. The lowest IPO withdrawal rate is about 3.5% in 2003 with a peak of 22% in 2011. Significant variation is also evident across countries. In Figure 6 we show the extent of withdrawals and variation over the database, by country. Typically between 10 and 20% of all filed IPOs do not subsequently list. As a preliminary investigation, in Table 3 we report the means and standard deviations of the variables, according to IPO status. We also provide a test for differences in means across status. The majority of companies withdrawing typically blame unfavourable market conditions. Successful IPOs are associated with higher levels of regulatory environment metrics such as the Rule of Law, Regulatory Efficiency or Common Law Jurisdiction which is consistent with previous findings (La Porta et al., 1998). Consistent with Chemmanur and Fulghieri (1999), successful IPO listings are during "hot"markets, the market estimate for future volatility (VIX) and the credit market conditions are lower. In contrast, market conditions, approximated with the change of the lead stock market index or GDP, are marginally positive for successful IPOs which supports the idea of market timing (Benninga et al., 2005). In addition, market sentiment seems to have an effect - negative news coverage is significantly more frequent for companies that withdraw their IPO than

for successful companies.

The offer size of withdrawn IPOs is significantly larger which enforces the claim that potential investors and IPO insiders have diverging views on the offer price and size (Benveniste and Spindt, 1989). As anticipated, withdrawn companies display significantly higher mean levels of debt and also are more likely to use the IPO proceeds to retire outstanding debts. We find a surprising result when we examine the role of private equity and venture capital. Withdrawals are more likely to have had PE or VC involvement than successful IPOs.

Besides this, consistent with Boeh and Southam (2011), withdrawn IPOs tend to have poorer corporate governance which is represented firstly in a shorter lock-up period. This is consistent with Brav and Gompers (2003) who establish longer lock-up periods as a positive signal. Also, withdrawn IPOs have fewer independent board members. While the lack of board independence is interpreted as an absence of a critical disciplining body of management, this might be perceived as risky by investors (Djerbi and Anis, 2015). Finally, withdrawn issues disclosed their intellectual capital and competitive advantage less often which is consistent with previous findings (Singh and van der Zahn, 2007).

4. The Determinants of IPO Withdrawal

4.1. General findings

In Table 4 the results of a probit analysis are given. We report the probit coefficient estimates and the corresponding p-values. We also provide the marginal effects which accounts for the impact of a unit change given one standard deviation of the variable on the probability of withdrawal (Aldrich and Nelson, 1984).[8] The results of the probit regression are largely consistent

[8]The regressions appear reasonably well specified as shown in Table 4. The HL goodness of fit test and the Pseudo-r^2 suggest an adequate model.

with the findings from the descriptive statistics. At a 5% significance level we find that 16 variables show explanatory power on the probability to withdraw an IPO.

Four offer characteristics come up as positive and significant. We find that the larger the offer size, the higher the probability of withdrawal. As mentioned above, one possibility is that larger issues are more likely to be withdrawn when they face skepticism at the aggregated demand from potential investors (Benveniste et al., 2002). We assume that this finding is driven by the determinants of IPO withdrawal in the UK and France as is shown in Tables 6 and 7.

The intent to retire debt with the proceeds of the IPO has negative signalling power to the investor (Owen-Smith et al., 2015). This is confirmed by the probit findings suggesting that debt retirement has net negative signals and increases the probability to withdraw as much as 4% according to the marginal effects in Table 4. Dunbar and Foerster (2008) hypothesise that debt signals the availability of alternative sources of finance, leading to a higher propensity of IPO withdrawal. In the European context, one can more likely conclude that debt and debt retirement serve as negative signals on the future success of the company. As Pagano et al. (1998) evidence that most companies intend to rebalance their accounts with the IPO in Europe. The objective of capital adjustment raises the level of risks perceived by the investor due to inefficiencies in the consequent capital structure or too leveraged position after all - which might lead to a lack of demand for the set offer price. Especially when considering the role of debt in Italy or Germany, banks exert substantial control over the firms such as being represented in the supervisory board or holding voting rights (Chirinko and Elston, 2006). Despite potential benefits of bank concentrated ownership, control dilemmas are presents in this construct (Elston and Rondi, 2006). Consequently moral hazard might arise, imposing a risk on future successes of the IPO company. Investors demand higher compensation which in com-

bination causes the company to be more likely to withdraw.

We find that VC and PE significantly and economically increases the probability of IPO withdrawal by almost 6% and 3%, respectively. We interpret this as evidence that the risk capital providers are not perceived as a certification of a strong positive signal to the issuer in Europe. On the contrary, it almost seems as if issues with VC and PE backing for Germany and Italy are seen as riskier. This can be lead back to the relatively lower level and complexity of PE and VC performance, reputation, and consistency in Europe as argued by Tykvova and Walz (2007). Compared to the USA, in general, the European market for venture capital and private equity is still seen as lagging behind, see as a discussion Bessler and Thies (2006), and more recently Bertoni et al. (2015). For a trade perspective on the persistent differences and relative lagging of the European markets, see Levin (2016), Basta (2017).

Proksch et al. (2017) undertake a qualitative analysis of German venture capital companies' business documentation showing that venture capital activity is rather heterogeneous in terms of value added activity within backed firms. There is clear evidence of financial but less clear evidence of operational value adding components. While France and Italy score below average on the VC/PE attractiveness index, Germany scores average due to the bank-led capital market. The UK scores highest on VC/PE attractiveness index given the depth of capital market but is still a fraction of the US market (Groh et al., 2010). Tykvova and Walz (2007) posit that venture capitalists and private equity firms have an information advantage over investors and will exploit this in IPOs. They find evidence that VC-backed IPOs face more severe underpricing in Germany, acting as an up front fee, for this exploitation hazard. Venture capital investment varies significantly in quality such as a lack of control negatively affecting the performance of same and henceforth the certification (Cumming, 2008). Some evidence to back this is also provided in Oehler et al. (2016) who note that there

is scant evidence of PE backed German IPO companies showing superior (short-term) out performance.[9] We can identify that this finding is mainly driven by the Italian and by the German IPO filings as the results in Tables 9 and 8 depict. Scribano (2015) notes that Italian companies with more prestigious underwriting syndicates and / or PE backing do not outperform.

Klein et al. (2016) attribute the banking system in Germany as the cornerstone of its capital market. PE and VC might not be independent from banks and thus be perceived as a riskier form of credit financing only. Moreover, risk capitalists pursue several exit alternatives alongside the IPO and as a consequence are more likely to withdraw the IPO for the benefit of a more favourable option (Cumming, 2008). In fact, Gill and Walz (2016) argue that an IPO with venture capital backing can be interpreted as a delayed trade sales which decreases the probability of future success for the IPO company. Reber (2017) analyse US evidence on the effect of VC backing on IPO downside risk, finding no evidence that it is mitigated.

Consistent with previous findings (Busaba, 2006, Dunbar and Foerster, 2008) the larger the firm size, the lower the probability of IPO withdrawal as information production costs are decreased (Chemmanur and Fulghieri, 1999). Two market characteristics positively influence the probability of IPO withdrawal. First, the market estimate of future volatility (VIX) increases the probability to withdrawal which is as expected as the uncertainty of the IPO company's future success increases. As suggested by the descriptive statistics, the presence of negative news prior to an IPO increases the probability to withdraw by as much as 14% which is a remarkably large effect. This result is by all means unsurprising, considering the importance of market sentiment and the effect of negative signals (Shi et al., 2016).

[9] As proposed by Nahata (2008), time-variant venture capital quality and consistency seems to be a piece to the risk capital puzzle. Given the sample size of VC-backed IPOs in Europe from 2001-2015 a qualitative approach seems most adequate which is beyond the limits of this paper.

The corporate governance metrics of lock-up period, board independence and CEO duality prove to be of significant explanatory power in accordance with the descriptive statistics. This supports the findings of Boeh and Southam (2011) that good corporate governance is a positive signal to investors and reduces the IPO company's uncertainty and likewise the probability to withdraw. We then break the sample into country specific elements. Considering the country specific results of the probit analysis for the UK, France, Germany, Italy, and Scandinavia in Tables 6, 7 and 8, 9, 10 it becomes clear that corporate governance metrics indeed reduce the probability of withdrawal. Lock-up periods are important in Europe, while in Germany retained ownership appears to matter more. All countries except France value independence of the board. As outlined the disclosure of intellectual capital or competitive advantages mitigates information asymmetries (Singh and van der Zahn, 2007). This holds to be true since our findings suggest that IC disclosure reduces the probability of withdrawal by about 6%. In particular this result provides reasonable evidence for the benefits of information revelation. Companies that withdraw their IPOs disclose their intellectual capital or competitive advantage less frequent imposing a higher evaluation cost on the potential investors. We conclude that the benefit of information disclosure reducing the uncertainty of the IPO company is exceeding the cost of same. Information disclosure can serve as a differentiator between good and bad firms. Bad firms would face high costs mimicking the same level of information disclosure by the good firms, leaving the bad ones to withdraw their IPO.

The only market condition that decreases the probability of IPO withdrawal is the Rule of Law, as expected by literature (La Porta et al., 1997). Only in the European probit model underwriter quality has a positive statistical explanatory power, while the economical effect is diminishing. Contextualising this finding, which seems to be driven by the French sample data

(see Table 7), [10] the country specific probit analyses even show a positive relationship between underwriter reputation and the probability to withdraw (see Tables 6, 8, 9, 10). In Germany, Italy, Scandinavia and the United Kingdom, more reputable underwriters are contracted for issues that were withdrawn. This outcome might well be driven by the German, Italian and Scandinavian IPO filings since the banking system can be considered quite different from the rest of the countries.

Summarizing, the following characteristics are of statistical and economical power: While the presence of negative news, venture capital or private equity backing and debt retirement increases the probability of IPO withdrawal, the disclosure of intellectual capital and better corporate governance decreases same. Consolidating our findings into the categories, the regulatory environment is net neutral in its statistical and economical signalling power, likewise the economic and market conditions. Whereas the offer characteristics statistically and economically show with a net negative signal. Firm characteristics and corporate governance characteristics might have a consolidated statistical net negative or positive signal and increase/ decrease the probability of withdrawal respectively, but lack the economical power . As it becomes evident, the country specific determinants of IPO withdrawal overwhelmingly coincide with the consolidated results for the European determinants of IPO withdrawal.

4.2. Comparison with US-findings

We already know that there exist differences between the European and American IPO markets (Ritter, 2003). Interestingly we can identify different empirical manifestations when examining the IPO phenomenon of withdrawal. While most results for the largest European equity markets show similarities to the US-based research, some of our findings are in contrast to Busaba et al. (2001), Dunbar and Foerster (2008), Boeh and Southam

[10] In the Extreme Bounds Analysis underwriter quality is statistically insignificant.

(2011). Previous studies (Busaba, 2006, Dunbar and Foerster, 2008) found that for successful IPO companies the offer size was significantly larger than for withdrawals. The results at hand contradict these US-findings. Withdrawn IPOs are of a significantly larger filing size. Busaba et al. (2001) points out that a larger offer size might reveal more information and thus reduces uncertainties. While this may be the case for US IPOs it does not seem to carry through to the European market.

The finding that is in starkest contrast to US studies is the role that venture capitalist and private equity involvement plays. Busaba et al. (2001) find that VC-backed companies that withdrew their IPO were less likely to succeed in a second-time IPO. In contrast, Dunbar and Foerster (2008) identify venture capitalist involvement as key for a successful return to the equity market. As already pointed out, compared to the USA, in general, the European market for venture capital and private equity is still seen as lagging behind (Bessler and Thies, 2006). Tykvova and Walz (2007) posit that venture capitalists and private equity firms have an information advantage over investors and will exploit this in IPOs. We uncover further evidence to cast doubt on the causal mechanisms of certification proposed for the USA consistent with Chahine and Filatotchev (2008) finding for France alone.

The variables that do not appear as significant are also of interest in comparison to previous US studies. Carter and Manaster (1990) and Krigman et al. (2001) established the positive signalling effect of the underwriters' reputation for the USA. Unlike in the study of withdrawals for the US market by Dunbar and Foerster (2008) reputation does not appear to matter in the European market. Klein et al. (2016) argue that companies chose their underwriter not on reputation as proposed by Krigman et al. (2001) but by previous linkages. Therefore, the certification role of underwriters that is observed in the USA does not apply to Germany, Italy, Scandinavia or the UK due to the specific universal operations of banks. A preexisting lend-

ing relationship with the underwriter bank may facilitates access to further credits (Klein et al., 2016).

4.3. Robustness checks

As a robustness check [11], we run probit regressions using dummy variables (where firm values are contrasted as above/below median sample values), as opposed to logarithmic values, for certain firm characteristics such as the firm size, offer size and firm age for the European sample as well as the country specific ones in Tables 4, 6, 7, 8, 9, 10 and 11. The majority of variables are significant in both specifications for the European dataset as well as for the country specific ones. We also run a probit regression excluding the UK as those IPOs constitute about 52% of our sample data. The results in Table 5 indicate that the probit regression remains broadly unchanged.

As a further robustness test we employ Extreme Bounds analysis following Sala-I-Martin (1997). The analysis allows us to surface the extent to which each variable influences the probability of IPO withdrawal across a wide variety of possible specifications. When evaluating the coefficients of the elements, we test whether these variables retain statistical significance across a wide range of the estimated models. As depicted in Table 12 and Figure 6 we can see that the significant variables from the probit regression of the European sample in Table 4 mostly retain significance in the EBA formulation. For instance, the Extreme Bound analysis makes evident that the presence of negative news, venture capital or private equity, a higher level of debt or the intent to retire debt with the IPO proceeds as well as a higher credit spread increases the probability of IPO withdrawal. Whereas higher levels of Rule of Law or Corporate Governance as well as disclosure

[11] Given the large number of possible variables that influence the probability of IPO withdrawal, we compute a correlation matrix which shows that multicollinearity is not present

of intellectual capital are significantly decreasing the probability of same. While the significant finding of the role of the underwriter in Table 4 does not retain statistical significance in the Extreme Bound analysis in Table 12 confirming our claim.

We run a stepwise probit regression, the results of which are shown in Table 11 using all 30 variables defined in Table 1. We see that all of the significant variables in the probit regression in Table 4 are likewise significant in the stepwise probit regression at a 5% significance level. Comparing the stepwise probit regression using the dummy variables for firm size, offer size and age in Table 11, our findings using the logarithmised values of same are confirmed. We also included a series of dummy variables which represent the OECD estimated recession periods for OECD members. Results are available on request but the dummy variables were not significant nor were there material changes in the estimated coefficients. All tests and databases are available upon request.

5. Conclusion

This study analyses a dataset of all IPO filings from 2001 through 2015 in the France, Germany, Italy, Scandinavia, Spain and the UK. What are the implications of our results? We postulate that Europe is different from the USA when it comes to the level and determinants of IPO withdrawals. We find that market sentiment does matter since negative news about an issuer or the level of estimated market volatility increase the probability of IPO withdrawal. While good corporate governance and the disclosure of intellectual capital decrease same. We find that venture capital and private equity involvement significantly *increases* the probability of withdrawal which is driven by the German and Italian markets. We explain this phenomenon with the less advanced role of these in Europe compared to the USA. We argue that investors perceive a large offer size, a higher level of debt and the intent to retire debt as risky. Drawing from the empirical evidence we can

suggest the following theoretical implications of determinants of IPO withdrawal within an information asymmetric framework. First, we can enforce the argument by Owen-Smith et al. (2015) that the process of IPO withdrawal is affected by a network of strong, weak, positive and negative signals of the determinants defined in Table 1. Overall, The costs to mimic good firms' signals such as the information disclosure or to drown out negative signals such as the negative news leave companies to withdraw their IPO. As to whether the IPO withdrawal itself is a negative or positive signal, this must be uncovered in further investigations. Second, the signalling power and direction of the determinants of IPO withdrawal within this network differ in the European compared to the USA market. Especially, we show that US-American findings such as the signalling effect of the underwriter as well as PE or VC involvement cannot be taken to automatically hold true for Europe. Third, we shed light on the difference and similarities of determinants of IPO withdrawal under the lens of European equity market integration.

Further evidence and research on the precise role played by VC and PE would be required to surface the causal mechanisms, however. We also identify the IPO allocation process and mechanism in the light of IPO withdrawal to be a interesting future research topic likewise extending this analysis to Asian IPO markets. Furthermore, an extension of the empirical and theoretical implication of IPO withdrawal on the IPO valuation and survival of matched IPO companies would be highly insightful.

6. References

Aggarwal, R., J. Berrill, E. Hutson, and C. Kearney (2011). What is a multinational corporation? Classifying the degree of firm-level multinationality. *International Business Review 20*(5), 557–577.

Aktas, N., C. Andres, and A. Ozdakak (2017). The interplay of IPO and M&A markets: The many ways one affects the other. In *Forthcoming in Oxford Handbook of IPOs edited by Douglas Cumming and Sofia Johan*, pp. 1–32.

Aldrich, J. H. and F. D. Nelson (1984). *Linear Probability, Logit, and Probit Models*. Iowa City: Sage QASS Series.

Allen, F. and G. R. Faulhaber (1989). Signaling by Underpricing in the IPO Market. *Journal of Financial Economics 23*, 303–323.

Baker, M. and J. Wurgler (2002). Market Timing and Capital Structure. *The Journal of Finance 57*(1).

Bancel, F. and U. R. Mittoo (2009). Why Do European Firms Go Public? *European Financial Management 15*(4), 844–884.

Barry, C. B. and V. T. Mihov (2015). Debt financing, venture capital, and the performance of initial public offerings. *Journal of Banking & Finance 58*, 144–165.

Basta, V. (2017). Venture investing in the US and Europe are totally different industries.

Benninga, S., M. Helmantel, and O. Sarig (2005). The timing of initial public offerings. *Journal of Financial Economics 75*, 115–132.

Benveniste, L. M., W. Y. Busaba, and W. J. Wilhelm (2002). Information Externalities and the Role of Underwriters in Primary Equity Markets. *Journal of Financial Intermediation 11*(1), 61–86.

Benveniste, L. M. and P. A. Spindt (1989). How investment bankers determine the offer price and allocation of new issues. *Journal of Financial Economics 24*(2), 343–361.

Bergbrant, M. C., D. Bradley, and D. M. Hunter (2015). Does bank loan supply affect the supply of equity capital? Evidence from new share issuance and withdrawal. *Journal of Financial Intermediation 29*, 32–45.

Bertoni, F., M. G. Colombo, and A. Quas (2015). The patterns of venture capital investment in Europe. *Small Business Economics 45*(3), 543560.

Bessler, W. and C. Bittelmeyer (2008). Patents and the performance of technology firms: Evidence from initial public offerings in Germany. *Financial Markets and Portfolio Management 22*(4), 323–356.

Bessler, W., C. Schneck, and J. Zimmermann (2017). Growth Strategies of Initial Public Offerings in Europe. *Working Paper*.

Bessler, W. and S. Thies (2006). Initial Public Offerings, Subsequent Seasoned Equity Offerings, and Long-Run Performance: Evidence from IPOs in Germany. *The Journal of Entrepreneurial Finance and Business Ventures 11*(3), 1–37.

Boeh, K. K. and C. G. Dunbar (2013). Post IPO Withdrawal Outcomes. *Working Paper*.

Boeh, K. K. and C. Southam (2011). Impact of initial public offering coalition on deal completion. *Venture Capital 13*(4), 313–336.

Brau, J. C. and S. Fawcett (2006). Initial public offerings: An analysis of theory and practice. *The Journal of Finance 61*(1), 399–436.

Brau, J. C., N. K. Sutton, and N. W. Hatch (2010). Dual-track versus single-track sell-outs: An empirical analysis of competing harvest strategies. *Journal of Business Venturing 25*(4), 389–402.

Brav, A. and P. Gompers (2003). The Role of Lockups in Initial Public Offerings. *Review of Financial Studies 16*(1), 1–29.

Busaba, W. Y. (2006). Bookbuilding, the option to withdraw, and the timing of IPOs. *Journal of Corporate Finance 12*(2), 159–186.

Busaba, W. Y., L. M. Benveniste, and R.-J. Guo (2001). The option to withdraw IPOs during the premarket: empirical analysis. *Journal of Financial Economics 60*, 73–102.

Carter, R. and S. Manaster (1990). Initial Public Offerings and Underwriter Reputation. *The Journal of Finance 45*(4), 1045–1067.

Chahine, S. and I. Filatotchev (2008). The effects of venture capitalist affiliation to underwriters on short- and long-term performance in French IPOs. *Global Finance Journal 18*(3), 351–372.

Chemmanur, T. J. and P. Fulghieri (1999). A Theory of the Going-Public Decision. *The Review of Financial Studies 12*(2), 249–279.

Chemmanur, T. J. and J. He (2011). IPO waves, product market competition, and the going public decision: Theory and evidence. *Journal of Financial Economics 101*(2), 382–412.

Chirinko, R. S. and J. A. Elston (2006). Finance, control and profitability: the influence of German banks. *Journal of Economic Behavior & Organization 59*, 69–88.

Connelly, B. L., S. T. Certo, D. Ireland, and C. R. Reutzel (2010). Signaling theory: A review and assessment. *Journal of Management 37*(1), 39–67.

Cumming, D. (2008). Contracts and Exits in Venture Capital Finance. *The Review of Financial Studies 21*(5), 1947–1982.

Djerbi, C. and J. Anis (2015). Boards, retained ownership and failure risk of French IPO firms. *Corporate Governance: The international journal of business in society 15*(1), 108–121.

Dunbar, C. G. (1998). The Choice between Firm-Commitment and Best-Efforts Offering Methods in IPOs: The Effect of Unsuccessful Offers. *Journal of Financial Intermediation 90*, 60–90.

Dunbar, C. G. and S. R. Foerster (2008). Second time lucky? Withdrawn IPOs that return to the market. *Journal of Financial Economics 87*(3), 610–635.

Edelen, R. M. and G. B. Kadlec (2005). Issuer surplus and the partial adjustment of IPO prices to public information. *Journal of Financial Economics 77*, 347–373.

Elston, J. A. and L. Rondi (2006). Shareholder Protection and the Cost of Capital. *Working Paper CERIS-CNR 3-24*.

Engelen, P. J. and M. van Essen (2010). Underpricing of IPOs: Firm-, issue- and country-specific characteristics. *Journal of Banking and Finance 34*(8), 1958–1969.

Ewens, M. and J. Farre-Mensa (2017). *The Evolution of the Private Equity Market and the Decline in IPOs*.

Field, L. C. and J. M. Karpoff (2002). Takeover defenses of IPO firms. *Journal of Finance 57*(5), 1857–1889.

Gill, A. and U. Walz (2016). Are VC-backed IPOs delayed trade sales? *Journal of Corporate Finance 37*, 356–374.

Goergen, M., A. Khurshed, and L. Renneboog (2009). Why are the French so different from the Germans? Underpricing of IPOs on the Euro New Markets. *International Review of Law and Economics 29*(3), 260–271.

Greene, M. (2016). Sale or IPO? Some Companies Take the Dual Route.

Groh, A. P., H. von Liechtenstein, and K. Lieser (2010). The European Venture Capital and Private Equity country attractiveness indices. *Journal of Corporate Finance 16*, 205–224.

Howton, S. D., S. W. Howton, and G. T. Olson (2001). Board Ownership and IPO Returns. *Journal of Economics and Finance 25*(1), 100–114.

Jenkinson, T. and H. Jones (2004). Bids and Allocations in European IPO Bookbuilding. *The Journal of Finance 54*(5), 2309–2338.

Klein, P. G., R. Wuebker, and K. Zoeller (2016). Relationship banking and conflicts of interest: Evidence from German initial public offerings. *Journal of Corporate Finance 39*, 210–221.

Krigman, L., W. H. Shaw, and K. L. Womack (2001). Why do firms switch underwriters? *Journal of Financial Economics 60*, 254–284.

La Porta, R., F. Lopez-de Silanes, A. Shleifer, and R. W. Vishny (1997). Legal Determinants of External Finance. *The Journal of Finance 52*(3), 1131–1151.

La Porta, R., F. Lopez-de Silanes, A. Shleifer, and R. W. Vishny (1998). Law and Finance. *The Journal of Political Economy 106*(6), 1113–1155.

Levin, E. (2016). Why Europe lags behind the US in VC investment.

Lian, Q. and Q. Wang (2012). Acquisition valuations of withdrawn IPOs: When IPO plans turn into mergers. *Journal of Banking & Finance 36*, 1424–1436.

Lowry, M. (2003). Why does IPO volume fluctuate so much? *Journal of Financial Economics 67*, 3–40.

McGuiness, P. B. (2016). IPO Firm Performance and Its Link with Board Officer Gender, Family-Ties and Otjer Demographics. *Journal of Business Ethics 43*, 197–212.

Migliorati, K. and S. Vismara (2014). Ranking underwriters of European IPOs. *European Financial Management 20*(5), 891–925.

Nahata, R. (2008). Venture capital reputation and investment performance. *Journal of Financial Economics 90*, 127–151.

Oehler, A., T. A. Herberger, M. Horn, and H. Schalkowski (2016). IPOs, the Level of Private Equity Engagement and Stock Performance Matters: Empirical Evidence from Germany. *Corporate Ownership and Control 15*, 72–82.

Owen-Smith, J., N. C. Cotton-Nessler, and H. Buhr (2015). Network effects on organizational decision-making: Blended social mechanisms and IPO withdrawal. *Social Networks 41*, 1–17.

Pagano, M., F. Panetta, and L. Zingales (1998). Why do companies go public? An empirical analysis. *The Journal of Finance 53*(1), 27–64.

Proksch, D., W. Stranz, N. Röhr, C. Ernst, A. Pinkwart, and M. Schefczyk (2017). Value-adding activities of venture capital companies: a content analysis of investors original documents in Germany. *Venture Capital 19*(3), 129–146.

Reber, B. (2017). Does mispricing, liquidity or third-party certification contribute to IPO downside risk? *International Review of Financial Analysis 51*, 25–53.

Ritter, J. R. (1987). The costs of going public. *Journal of Financial Economics 19*, 269–281.

Ritter, J. R. (2003). Differences between European and American IPO Markets. *European Financial Management 9*(4), 421–434.

Rock, K. (1986). Why New Issues are Underpriced. *Journal of Financial Economics 15*, 187–212.

Sala-I-Martin, X. X. (1997). I Just Ran Two Million Regressions. *American Economic Review 87*(2), 178–183.

Scribano, F. (2015). The Impact of Third- Party Certification on Italian Initial Public Offerings. *Working Paper*.

Sherman, A. E. and S. Titman (2002). Building the IPO order book: Underpricing and participation limits with costly information. *Journal of Financial Economics 65*(1), 3–29.

Shi, Y., W. M. Liu, and K. Y. Ho (2016). Public news arrival and the idiosyncratic volatility puzzle. *Journal of Empirical Finance 37*, 159–172.

Singh, I. and J.-L. van der Zahn (2007). Does intellectual capital disclosure reduce an IPO's cost of capital? The case of underpricing. *Journal of Intellectual Capital 8*(3), 494–516.

Tykvova, T. and U. Walz (2007). How important is participation of different venture capitalists in German IPOs? *Global Finance Journal 17*(3), 350–378.

Table 1: Data Definition and Sources

Variable	Variable Name	Source	Definition	Predicted Effect
a_1	ROL - Rule of Law	The Heritage Foundation	Provides annual data on how the rule of law and its enforcement is experienced by the general public including dimensions such as property rights and freedom from corruption.	-
a_2	Regulatory Efficiency	The Heritage Foundation	Provides annual data on how the regulatory efficiency is experienced by the general public including quantitative measures such as labour, business and monetary freedom.	-
a_3	Open Markets	The Heritage Foundation	Provides annual data on how the openness of the markets is experienced by the general public including dimensions such as trade, investment and financial freedom.	-
a_4	Common Law Dummy	Prospectus	This dummy variable takes the value of 1 if the IPO is in a common law jurisdiction and 0 otherwise.	-
Economic	**Environment**			
a_5	10 yr Government Bond	Thomson Reuters Datastream	The basis points of the 10 year Government Bond yields are provided on a monthly basis and approximate the cost of lending.	-

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Table 1 – continued from previous page

Variable	Variable Name	Source	Definition	Predicted Effect
a_6	Credit Spread	Thomson Reuters Datastream	The monthly difference between the 10 yr Government Bond and the 1 year Government Bond yields signals the credit conditions.	+
a_7	dGDP - change of the Gross Domestic Product	Bloomberg	An aggregate measure of production equal to the sum of the gross values added of all resident, institutional units engaged in production. It provides information on the economic performance of a country.	-
Market	**Environment**			
a_8	dIndex - change of the stock market index	Bloomberg/ Thomson Reuters Datastream	It is the change of the corresponding main stock market index providing information on the equity market (bull or bear market).	-
a_9	VIX - Chicago Board Options Exchange SPX Volatility Index	Bloomberg	This index represents a market estimate of the future volatility.	+

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Table 1 – continued from previous page

Variable	Variable Name	Source	Definition	Predicted Effect
a_{10}	Hotness Dummy	Bloomberg	The rolling averages of the number of filings 180 days prior to the IPO are computed. If the company faces a higher competition than average, the dummy variable takes a value of 1 and 0 otherwise. This dummy is not complimentary to a coldness dummy.	-
a_{11}	Negative News Dummy	Lexis Nexis (handpicked)	If the IPO company is mentioned in the same paragraph with specific negative terms given by the Lexis Nexis Negative News Search one year prior to the IPO or withdrawal, the dummy takes the value of 1 and 0 otherwise. The negative terms defined by the Lexis Nexis Negative News Search as well as the code in the different languages is available upon request. `http://help.lexisnexis.com/tabula-rasa/lninexis/searchnegativecompanyinfo_hdi-task?lbu=GB&locale=es_ES&audience=business`	+
Offer	**Characteristics**			
a_{12}	Offer Size	Prospectus/ Bloomberg	The natural logarithm of the company's offer size is computed.	+

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Table 1 – continued from previous page

Variable	Variable Name	Source	Definition	Predicted Effect
	Offer Size Dummy	Prospectus/ Bloomberg	The rolling averages of the offer sizes are computed. This dummy takes the value of 1 if the size of the offer is above average and 0 otherwise.	+
a_{13}	Debt Retirement Dummy	Prospectus	This dummy variable takes the value of 1 if the IPO company intends to retire debt with the IPO proceeds and 0 otherwise.	+
a_{14}	IC - Intellectual Capital Dummy	Prospectus	This dummy variable takes a value of 1 if the company discloses the intellectual capital or its competitive advantage in the prospectus and 0 if the IC is not mentioned or disclosed.	-
a_{15}	PE - Private Equity Dummy	Prospectus	This dummy variable takes a value of 1 if the company mentions private equity involvement in the prospectus and 0 otherwise.	+
a_{16}	VC - Venture Capital Dummy	Prospectus	This dummy variable takes a value of 1 if the company mentions venture capital involvement in the prospectus and 0 otherwise.	+

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Table 1 – continued from previous page

Variable	Variable Name	Source	Definition	Predicted Effect
a_{17}	Underwriter	Prospectus/ Bloomberg	The underwriter reputation is classified according to the European ranking of Migliorati and Vismara (2014) which ranges from 0 to the highest reputation of 1. In case of a consortium of underwriters, the average of the underwriter reputation is taken.	-
Firm	**Characteristics**			
a_{18}	Firm Size	Prospectus/ Bloomberg	The natural logarithm of the company's total assets is computed.	-
	Firm Size Dummy	Prospectus/ Bloomberg	The rolling averages of the firm sizes measured by total assets are computed. This dummy takes the value of 1 if the size of the company is above average and 0 otherwise.	-
a_{19}	Age	Prospectus/ Bloomberg	The natural logarithm of the company's age is computed.	-
	Age Dummy	Prospectus/ Bloomberg	The rolling averages of the firm ages are computed. The dummy takes a value of 1 if the firm age is above average and 0 otherwise.	-
a_{20}	CapEx - Capital Expenditures	Prospectus/ Bloomberg	The position of capital expenditures is divided by the total assets to get the CapEx ratio.	-

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Table 1 – continued from previous page

Variable	Variable Name	Source	Definition	Predicted Effect
a_{21}	NI - Net Income	Prospectus/ Bloomberg	The position of net income is divided by the total assets to get the return on assets.	-
a_{22}	Debt	Prospectus/ Bloomberg	The position of debt is divided by the total assets to compute the level of leverage of the IPO company.	+
a_{23}	High-tech Dummy	Prospectus/ Company Register	This dummy variable takes the value of 1 if the IPO company belongs to the high-tech industry and 0 otherwise. The categorisation of high-tech is based on the Eurostat definition and includes the following NACE codes (nomenclature statistique des activits conomiques dans la Communaut europenne): 21, 26, 59, 60, 61, 62, 63, 72.	+
a_{24}	MNAT- Multinationality	Prospectus	The scale of Aggarwal et al. (2011) is taken to quantify the degree of multinationality which includes for instance the revenue created abroad or foreign assets. In case no country-level information can be gathered, the presence of subsidiaries are taken. The scale differentiates between seven categories of multinationality where the highest level of MNAT is the cumulation of all classifications up to the value of 1.	-

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Table 1 – continued from previous page

Variable	Variable Name	Source	Definition	Predicted Effect
Corporate Governance		**Characteristics**		
a_{25}	Retained Ownership	Prospectus	The proportion of ownership in shares hold by insiders post IPO (Djerbi and Anis, 2015).	-
a_{26}	Lock-Up	Prospectus	The days after the filing which the pre-IPO owners have agreed on not to sell their shares.	-
a_{27}	Board Size	Prospectus	This variable accounts for the absolute number of board members.	-
a_{28}	Board Independence	Prospectus	This variable accounts for the ratio of board members that have no link to the IPO company.	-
a_{29}	Female Board Members	Prospectus	This variable accounts for the ratio of female board members.	-
a_{30}	CEO Duality Dummy	Prospectus	This dummy variable takes the value of 1 if the roles of a CEO and chairman are combined and 0 otherwise.	-

Table 2: Withdrawn and successful IPOs 2001 - 2015

	Successful IPOs		Withdrawn IPOs		
Year	Absolute	Percentage	Absolute	Percentage	Total
2001	192	83.48%	38	16.52%	230
2002	112	84.21%	21	15.79%	133
2003	81	96.43%	3	3.57%	84
2004	261	91.90%	23	8.10%	284
2005	366	91.73%	33	8.27%	399
2006	360	89.11%	44	10.89%	404
2007	283	91.00%	28	9.00%	311
2008	88	82.24%	19	17.76%	107
2009	16	88.89%	2	11.11%	18
2010	112	81.16%	26	18.84%	138
2011	99	77.95%	28	22.05%	127
2012	58	85.29%	10	14.71%	68
2013	95	89.62%	11	10.38%	106
2014	175	87.94%	24	12.06%	199
2015	176	88.00%	24	12.00%	200
Total	2474	88.11%	334	11.89%	2808

The database includes 2808 observations from 2001-2015. This table reports the absolute number and percentage of IPO filings for each year in Denmark, France, Germany, Italy, Norway, Spain, Sweden, and the United Kingdom.

Table 3: Descriptive Statistics

Variable	Successful IPOs Mean	St.D.	Withdrawn IPOs Mean	St.D.	p-value successful vs. withdrawn
Regulatory Environment					
α1 Rule of Law	81.82	11.10	78.15	13.88	0.0000
α2 Regulatory Efficiency	79.35	5.95	78.47	5.89	0.0109
α3 Open Markets	78.92	8.46	78.55	7.62	0.4533
α4 Common Law Dummy	0.53	0.50	0.44	0.50	0.0025
Economic Environment					
α5 10yr Government Bond	3.89	1.19	3.86	1.18	0.6443
α6 Credit Spread	0.88	1.17	1.23	1.22	0.0000
α7 dGDP	0.02	0.01	0.02	0.01	0.0737
Market Environment					
α8 dINDEX	0.00	0.03	0.00	0.04	0.0003
α9 VIX	17.04	5.55	18.66	6.28	0.0000
α10 Hotness Dummy	0.63	0.48	0.58	0.49	0.0661
α11 Negative News Dummy	0.07	0.25	0.31	0.46	0.0000
Offer Characteristics					
α12 Offer Size (€mn)	174.71	2529.41	504.96	2912.79	0.0281
α13 Debt Retirement Dummy	0.14	0.35	0.27	0.45	0.0000
α14 Intellectual Capital Dummy	0.34	0.47	0.19	0.39	0.0000
α15 Private Equity Dummy	0.16	0.37	0.24	0.43	0.0003
α16 Venture Capital Dummy	0.06	0.23	0.10	0.30	0.0033
α17 Underwriter	0.24	0.26	0.25	0.27	0.7456
Firm Characteristics					
α18 Firm Size (€mn)	1683.34	16820.81	6645.30	59782.44	0.0011
α19 Age	15.55	26.39	21.98	33.84	0.0001
α20 CapEx	0.20	4.43	0.13	1.28	0.7780
α21 Net Income	-0.07	6.48	0.55	13.81	0.1700
α22 Debt	0.62	1.22	3.07	40.08	0.0025
α23 High-tech Dummy	0.24	0.43	0.21	0.41	0.2878
α24 Multinationality	0.29	0.18	0.31	0.20	0.1832
Corporate Governance Characteristics					
α25 Retained Ownership	0.56	0.26	0.52	0.29	0.0033
α26 Lock-Up (days)	250.74	175.13	126.64	164.79	0.0000
α27 Board Size	5.62	2.63	5.87	3.91	0.1160
α28 Board Independence	0.26	0.27	0.15	0.22	0.0000
α29 Female Board Members (%)	0.09	0.14	0.09	0.15	0.5873
α30 CEO Duality	0.15	0.36	0.14	0.35	0.6840

The database includes 2474 observations for successful IPOs and 334 for withdrawn IPOs. This table reports the means and standard deviations for 30 variables broken down by successful and withdrawn IPO filing. All variable definitions can be found in Table 1.

Table 4: Determinants of IPO Withdrawal

	Probit Regression (Levels)		Probit Regression (Dummy Variables)	
Variable	Coef	Marginal Effect (pct)	Coef	Marginal Effect (pct)
Regulatory Environment				
α1 Rule of Law	-0.0163***	-0.25	-0.0157***	-0.24
α2 Regulatory Efficiency	0.0014	0.02	0.0010	0.01
α3 Open Markets	0.0079***	0.12	0.0093***	0.14
α4 Common Law Dummy	-0.2781	-4.22	-0.3445*	-5.34
Economic Environment				
α5 10yr Government Bond	-0.0001	0.00	-0.0002	0.00
α6 Credit Spread	-0.0001	0.00	0.0000	0.00
α7 dGDP	0.0003	0.00	0.0003	0.01
Market Environment				
α8 dINDEX	-0.0001	0.00	-0.0002	0.00
α9 VIX	0.0019*	0.03	0.0015	0.02
α10 Hotness Dummy	0.0243	0.37	0.0264	0.41
α11 Negative News Dummy	0.8967***	13.61	0.9148***	14.192
Offer Characteristics				
α12 Offer Size / Dummy	0.0004***	0.01	0.3541***	5.49
α13 Debt Retirement Dummy	0.2739***	4.16	0.2565**	3.98
α14 Intellectual Capital Dummy	-0.3644***	-5.53	-0.3478***	-5.40
α15 Private Equity Dummy	0.1974*	3.00	0.1780	2.76
α16 Venture Capital Dummy	0.3186**	4.83	0.3403**	5.28
α17 Underwriter	-0.0006**	-0.01	-0.0005*	-0.01
Firm Characteristics				
α18 Firm Size / Dummy	-0.0004***	-0.01	-0.2934**	-4.55
α19 Age / Dummy	0.0023	0.03	-0.0592	-0.92
α20 CapEx	-0.0002***	0.00	-0.0002***	0.00
α21 Net Income	-0.0001*	0.00	-0.0001	0.00
α22 Debt	0.0001	0.00	0.0001	0.00
α23 High-tech Dummy	0.0227	0.34	0.0163	0.25
α24 Multinationality	0.0158	0.24	0.0288	0.45
Corporate Governance Characteristics				
α25 Retained Ownership	-0.0001	0.00	-0.0001*	0.00
α26 Lock-Up	-0.0025***	-0.04	-0.0025***	-0.04
α27 Board Size	-0.0179	-0.27	-0.0019	-0.03
α28 Board Independence	-0.0081***	-0.12	-0.0084***	-0.13
α29 Female Board Members	-0.0030	-0.05	-0.0023	-0.04
α30 CEO Duality	-0.4277***	-6.49	-0.3758***	-5.83
HL Statistic	13.47		19.79	
McFadden-R^2	0.2458		0.2287	

The dependent variable equals 1 for IPO withdrawals and 0 otherwise. Marginal Effects are defined as follows. The probit employs normalisation that fixes the standard deviation of the error term to 1 where each coefficient represents the marginal effect of a unit change on the probability that the dependent variable takes the value of 1 (IPO withdrawal) given that all other independent variables are constant (Aldrich and Nelson, 1984). The McFadden R-squared is defined as 1 less the log likelihood for the estimated model divided by the log likelihood for a model with only an intercept as an independent variable. While the Hosmer-Lemeshow Statistic represents the goodness of fit that observed events match estimated events in ten subgroups of the model population. The database includes 2808 observations. Other goodness of fit variables for the probit regression using all 30 variables defined in Table 1 include the p-value HL 0.0967 and for the second regression using the dummy variables for firm size, offer size and firm age we get a p-value HL 0.0113.

Table 5: Determinants of IPO Withdrawal excl. UK

	Probit Regression (Levels)		Probit Regression (Dummy Variables)	
Variable	Coef	Marginal Effect (pct)	Coef	Marginal Effect (pct)
Regulatory Environment				
α1 Rule of Law	-0.0191***	-0.32	-0.0187***	-0.32
α2 Regulatory Efficiency	0.0009	0.02	0.0004	0.01
α3 Open Markets	0.0097***	0.16	0.0108***	0.18
Economic Environment				
α4 10yr Government Bond	0.0007	0.01	0.0007	0.01
α5 Credit Spread	-0.0004	-0.01	-0.0003	-0.01
α6 dGDP	0.0009	0.01	0.0007	0.01
Market Environment				
α7 dINDEX	-0.0003	-0.01	-0.0004	-0.01
α8 VIX	0.0010	0.02	0.0005	0.01
α9 Hotness Dummy	-0.1001	-1.68	-0.1005	-1.70
α10 Negative News Dummy	1.0490***	17.63	1.0934***	18.47
Offer Characteristics				
α11 Offer Size / Dummy	0.0007***	0.01	0.3428**	5.79
α12 Debt Retirement Dummy	0.3625**	6.09	0.3752***	6.34
α13 Intellectual Capital Dummy	-0.2526**	-4.24	-0.2272*	-3.84
α14 Private Equity Dummy	0.1378	2.32	0.1371	2.32
α15 Venture Capital Dummy	0.5274***	8.86	0.5072***	8.57
α16 Underwriter	-0.0009*	-0.02	-0.0008	-0.01
Firm Characteristics				
α17 Firm Size / Dummy	-0.0006***	-0.01	-0.4034**	-6.81
α18 Age / Dummy	0.0022	0.04	-0.0451	-0.76
α19 CapEx	-0.0002	0.00	-0.0002	0.00
α20 Net Income	-0.0003*	0.00	-0.0002	0.00
α21 Debt	0.0000	0.00	0.0000	0.00
α22 High-tech Dummy	0.0415	0.70	0.0079	0.13
α23 Multinationality	0.0218	0.37	0.0432	0.73
Corporate Governance Characteristics				
α24 Retained Ownership	-0.0005**	-0.01	-0.0006***	-0.01
α25 Lock-Up	-0.0023***	-0.04	-0.0024***	-0.04
α26 Board Size	-0.0148	-0.25	0.0049	0.08
α27 Board Independence	-0.0074***	-0.12	-0.0072***	-0.12
α28 Female Board Members	-0.0039	-0.07	-0.0034	-0.06
α29 CEO Duality	-0.8098***	-13.61	-0.8171***	-13.80
HL Statistic	11.26		5.67	
McFadden-R^2	0.2429		0.2395	

The dependent variable equals 1 for IPO withdrawals and 0 otherwise. Marginal Effects are defined as follows. The probit employs normalisation that fixes the standard deviation of the error term to 1 where each coefficient represents the marginal effect of a unit change on the probability that the dependent variable takes the value of 1 (IPO withdrawal) given that all other independent variables are constant (Aldrich and Nelson, 1984). The McFadden R-squared is defined as 1 less the log likelihood for the estimated model divided by the log likelihood for a model with only an intercept as an independent variable. While the Hosmer-Lemeshow Statistic represents the goodness of fit that observed events match estimated events in ten subgroups of the model population. The French, German, Italian, Scandinavian and Spanish database includes 1354 observations. Other goodness of fit variables for the probit regression using all 29 variables defined in Table 1 include the p-value HL 0.1876 and for the second regression using the dummy variables for firm size, offer size and firm age the p-value HL 0.6836.

Table 6: Determinants of IPO Withdrawal - UK

	Probit Regression (Levels)		Probit Regression (Dummy Variables)	
Variable	Coef	Marginal Effect (pct)	Coef	Marginal Effect (pct)
Regulatory Environment				
α1 Rule of Law	-0.0336	-0.40	-0.0329	-0.41
α2 Regulatory Efficiency	-0.0215	-0.25	-0.0209	-0.26
α3 Open Markets	-0.0193	-0.23	-0.0115	-0.14
Economic Environment				
α4 10yr Government Bond	-0.0009	-0.01	-0.0016	-0.02
α5 Credit Spread	0.0001	0.00	0.0003	0.00
α6 dGDP	-0.0142	-0.17	-0.0097	-0.12
Market Environment				
α7 dINDEX	0.0010	0.01	0.0007	0.01
α8 VIX	0.0017	0.02	0.0015	0.02
α9 Hotness Dummy	0.0243	0.29	0.0051	0.06
α10 Negative News Dummy	0.8231***	9.73	0.8487***	10.58
Offer Characteristics				
α11 Offer Size / Dummy	0.0009***	0.01	0.2666	3.32
α12 Debt Retirement Dummy	0.3004*	3.55	0.2403	3.00
α13 Intellectual Capital Dummy	-0.9934***	-11.75	-0.9710***	-12.11
α14 Private Equity Dummy	0.3565	4.22	0.2452	3.06
α15 Venture Capital Dummy	0.1916	2.27	0.2334	2.91
α16 Underwriter	0.0001	0.00	-0.0001	0.00
Firm Characteristics				
α17 Firm Size / Dummy	-0.0010***	-0.01	-0.0455	-0.57
α18 Age / Dummy	0.0012	0.01	-0.1042	-1.30
α19 CapEx	-0.0008***	-0.01	-0.0008***	-0.01
α20 Net Income	-0.0001	0.00	0.0000	0.00
α21 Debt	0.0002	0.00	0.0002	0.00
α22 High-tech Dummy	0.0564	0.67	0.0817	1.02
α23 Multinationality	0.0409	0.48	0.0282	0.35
Corporate Governance Characteristics				
α24 Retained Ownership	0.0003	0.00	0.0002	0.00
α25 Lock-Up	-0.0026***	-0.03	-0.0025***	-0.03
α26 Board Size	0.0046	0.05	0.0073	0.09
α27 Board Independence	-0.0310***	-0.37	-0.0345***	-0.43
α28 Female Board Members	-0.0012	-0.01	0.0005	0.01
α29 CEO Duality	0.1754	2.07	0.2064	2.57
HL Statistic	9.54		10.92	
McFadden-R^2	0.3405		0.3048	

The dependent variable equals 1 for IPO withdrawals and 0 otherwise. Marginal Effects are defined as follows. The probit employs normalisation that fixes the standard deviation of the error term to 1 where each coefficient represents the marginal effect of a unit change on the probability that the dependent variable takes the value of 1 (IPO withdrawal) given that all other independent variables are constant (Aldrich and Nelson, 1984). The McFadden R-squared is defined as 1 less the log likelihood for the estimated model divided by the log likelihood for a model with only an intercept as an independent variable. While the Hosmer-Lemeshow Statistic represents the goodness of fit that observed events match estimated events in ten subgroups of the model population. The UK database includes 1454 observations. Other goodness of fit variables for the probit regression using all 29 variables defined in Table 1 include the p-value HL 0.2991 and for the second regression using the dummy variables for firm size, offer size and firm age the p-value HL 0.2061.

Table 7: Determinants of IPO Withdrawal - France

	Probit Regression (Levels)		Probit Regression (Dummy Variables)	
Variable	Coef	Marginal Effect (pct)	Coef	Marginal Effect (pct)
Regulatory Environment				
α1 Rule of Law	-0.1948**	-2.01	-0.1241*	-1.37
α2 Regulatory Efficiency	0.0016	0.02	-0.0522	-0.58
α3 Open Markets	0.0503	0.52	0.0571	0.63
Economic Environment				
α4 10yr Government Bond	-0.0094	-0.10	-0.0009	-0.01
α5 Credit Spread	-0.0038	-0.04	-0.0026	-0.03
α6 dGDP	0.0381	0.39	0.0779*	0.86
Market Environment				
α7 dINDEX	0.0043	0.04	0.0032	0.04
α8 VIX	0.0059	0.06	-0.0002	0.00
α9 Hotness Dummy	-0.3256	-3.36	-0.1337	-1.48
α10 Negative News Dummy	1.0793***	11.13	0.9626***	10.64
Offer Characteristics				
α11 Offer Size / Dummy	0.0074***	0.08	1.0410**	11.51
α12 Debt Retirement Dummy	0.6484*	6.69	0.6922**	7.65
α13 Intellectual Capital Dummy	-0.6174	-6.37	-1.0080***	-11.14
α14 Private Equity Dummy	0.0970	1.00	0.3043	3.36
α15 Venture Capital Dummy	0.7907	8.15	0.8974**	9.92
α16 Underwriter	-0.0084*	-0.09	-0.0046	-0.05
Firm Characteristics				
α17 Firm Size / Dummy	-0.0002	0.00	-0.0069	-0.08
α18 Age / Dummy	-0.0057	-0.06	-0.4904	-5.42
α19 CapEx	-0.0015	-0.01	-0.0010	-0.01
α20 Net Income	-0.0015	-0.02	-0.0008	-0.01
α21 Debt	0.0007	0.01	-0.0001	0.00
α22 High-tech Dummy	-0.1852	-1.91	-0.1914	-2.12
α23 Multinationality	0.0899	0.93	0.1459	1.61
Corporate Governance Characteristics				
α24 Retained Ownership	-0.0015	-0.02	-0.0020	-0.02
α25 Lock-Up	-0.0043***	-0.04	-0.0032**	-0.04
α26 Board Size	-0.1505***	-1.55	-0.0922	-1.02
α27 Board Independence	-0.0180	-0.19	-0.0218	-0.24
α28 Female Board Members	-0.0139	-0.14	-0.0158	-0.17
α29 CEO Duality	-0.7038**	-7.26	-0.6589**	-7.28
HL Statistic	0.96		12.25	
McFadden-R^2	0.4251		0.3942	

The dependent variable equals 1 for IPO withdrawals and 0 otherwise. Marginal Effects are defined as follows. The probit employs normalisation that fixes the standard deviation of the error term to 1 where each coefficient represents the marginal effect of a unit change on the probability that the dependent variable takes the value of 1 (IPO withdrawal) given that all other independent variables are constant (Aldrich and Nelson, 1984). The McFadden R-squared is defined as 1 less the log likelihood for the estimated model divided by the log likelihood for a model with only an intercept as an independent variable. While the Hosmer-Lemeshow Statistic represents the goodness of fit that observed events match estimated events in ten subgroups of the model population. The French database includes 398 observations. Other goodness of fit variables for the probit regression using all 29 variables defined in Table 1 include the p-value HL 0.9985 and for the second regression using the dummy variables for firm size, offer size and firm age the p-value HL 0.1406.

Table 8: Determinants of IPO Withdrawal - Germany

	Probit Regression (Levels)		Probit Regression (Dummy Variables)	
Variable	Coef	Marginal Effect (pct)	Coef	Marginal Effect (pct)
Regulatory Environment				
α1 Rule of Law	-0.0372	-0.44	0.0038	0.04
α2 Regulatory Efficiency	-0.0392	-0.46	-0.0588	-0.70
α3 Open Markets	-0.0786	-0.93	-0.1088	-1.29
Economic Environment				
α4 10yr Government Bond	-0.0026	-0.03	-0.0014	-0.02
α5 Credit Spread	-0.0051	-0.06	-0.0045	-0.05
α6 dGDP	0.0081	0.10	-0.0005	-0.01
Market Environment				
α7 dINDEX	-0.0063	-0.07	-0.0078	-0.09
α8 VIX	0.0091	0.11	0.0088	0.10
α9 Hotness Dummy	-0.2988	-3.53	-0.4932	-5.84
α10 Negative News Dummy	1.4770***	17.46	1.3600***	16.09
Offer Characteristics				
α11 Offer Size / Dummy	0.0032	0.04	0.4612	5.46
α12 Debt Retirement Dummy	0.6841	8.09	0.8448*	10.00
α13 Intellectual Capital Dummy	-0.1927	-2.28	-0.1003	-1.19
α14 Private Equity Dummy	0.8406**	9.94	0.8219**	9.72
α15 Venture Capital Dummy	2.8850***	34.11	2.8060***	33.21
α16 Underwriter	0.0002	0.00	0.0009	0.01
Firm Characteristics				
α17 Firm Size / Dummy	-0.0066***	-0.08	-1.2100**	-14.32
α18 Age / Dummy	-0.0029	-0.03	-0.5675	-6.71
α19 CapEx	0.0039**	0.05	0.0018	0.02
α20 Net Income	0.0000	0.00	0.0008	0.01
α21 Debt	0.0021	0.03	0.0019	0.02
α22 High-tech Dummy	-0.3894	-4.60	-0.5607	-6.63
α23 Multinationality	0.1583	1.87	0.2453**	2.90
Corporate Governance Characteristics				
α24 Retained Ownership	-0.0045**	-0.05	-0.0047**	-0.06
α25 Lock-Up	-0.0012	-0.01	-0.0015	-0.02
α26 Board Size	0.0673	0.80	0.0826**	0.98
α27 Board Independence	-0.0468**	-0.55	-0.0465**	-0.55
α28 Female Board Members	-0.0169	-0.20	-0.0102	-0.12
α29 CEO Duality	-5.4940	-64.95	-5.6260	-66.56
HL Statistic	6.06		3.73	
McFadden-R^2	0.4714		0.4723	

The dependent variable equals 1 for IPO withdrawals and 0 otherwise. Marginal Effects are defined as follows. The probit employs normalisation that fixes the standard deviation of the error term to 1 where each coefficient represents the marginal effect of a unit change on the probability that the dependent variable takes the value of 1 (IPO withdrawal) given that all other independent variables are constant (Aldrich and Nelson, 1984). The McFadden R-squared is defined as 1 less the log likelihood for the estimated model divided by the log likelihood for a model with only an intercept as an independent variable. While the Hosmer-Lemeshow Statistic represents the goodness of fit that observed events match estimated events in ten subgroups of the model population. The German database includes 295 observations. Other goodness of fit variables for the probit regression using all 29 variables defined in Table 1 include the p-value HL 0.6400 and for the second regression using the dummy variables for firm size, offer size and firm age the p-value HL 0.8802.

Table 9: Determinants of IPO Withdrawal - Italy

	Probit Regression (Levels)		Probit Regression (Dummy Variables)	
Variable	Coef	Marginal Effect (pct)	Coef	Marginal Effect (pct)
Regulatory Environment				
α1 Rule of Law	-0.1436*	-1.67	-0.1626**	-1.89
α2 Regulatory Efficiency	-0.0606	-0.70	-0.0361	-0.42
α3 Open Markets	-0.0700	-0.81	-0.0317	-0.37
Economic Environment				
α4 10yr Government Bond	0.0087	0.10	0.0102	0.12
α5 Credit Spread	0.0073	0.08	-0.0018	-0.02
α6 dGDP	0.0058	0.07	0.0017	0.02
Market Environment				
α7 dINDEX	0.0031	0.04	0.0068	0.08
α8 VIX	0.0058	0.07	0.0071	0.08
α9 Hotness Dummy	-0.4044	-4.69	-0.2654	-3.09
α10 Negative News Dummy	1.3630***	15.82	1.6600***	19.32
Offer Characteristics				
α11 Offer Size / Dummy	0.0035	0.04	-0.7298	-8.49
α12 Debt Retirement Dummy	0.6737	7.82	0.7784	9.06
α13 Intellectual Capital Dummy	-0.9649***	-11.20	-1.0210***	-11.88
α14 Private Equity Dummy	0.0095	0.11	0.0625	0.73
α15 Venture Capital Dummy	1.4280**	16.57	1.6580**	19.30
α16 Underwriter	0.0098	0.11	0.0135**	0.16
Firm Characteristics				
α17 Firm Size / Dummy	0.0036	0.04	0.4119	4.79
α18 Age / Dummy	0.0001	0.00	0.6501	7.57
α19 CapEx	-0.0132***	-0.15	-0.0124***	-0.14
α20 Net Income	0.0010	0.01	0.0019	0.02
α21 Debt	0.0028	0.03	0.0035	0.04
α22 High-tech Dummy	0.4078	4.73	0.3712	4.32
α23 Multinationality	-0.0387	-0.45	0.0077	0.09
Corporate Governance Characteristics				
α24 Retained Ownership	0.0004	0.00	0.0001	0.00
α25 Lock-Up	-0.0044***	-0.05	-0.0049***	-0.06
α26 Board Size	0.0323	0.37	0.0391	0.46
α27 Board Independence	-0.0337	-0.39	-0.0261	-0.30
α28 Female Board Members	-0.0099	-0.12	-0.0072	-0.08
α29 CEO Duality	-0.2782	-3.23	-0.5105	-5.94
HL Statistic	2.27		3.21	
McFadden-R^2	0.6173		0.6152	

The dependent variable equals 1 for IPO withdrawals and 0 otherwise. Marginal Effects are defined as follows. The probit employs normalisation that fixes the standard deviation of the error term to 1 where each coefficient represents the marginal effect of a unit change on the probability that the dependent variable takes the value of 1 (IPO withdrawal) given that all other independent variables are constant (Aldrich and Nelson, 1984). The McFadden R-squared is defined as 1 less the log likelihood for the estimated model divided by the log likelihood for a model with only an intercept as an independent variable. While the Hosmer-Lemeshow Statistic represents the goodness of fit that observed events match estimated events in ten subgroups of the model population. The Italian database includes 242 observations. Other goodness of fit variables for the probit regression using all 29 variables defined in Table 1 include the p-value HL 0.9705 and for the second regression using the dummy variables for firm size, offer size and firm age the p-value HL 0.9208.

Table 10: Determinants of IPO Withdrawal - Scandinavia

	Probit Regression (Levels)		Probit Regression (Dummy Variables)	
Variable	Coef	Marginal Effect (pct)	Coef	Marginal Effect (pct)
Regulatory Environment				
α1 Rule of Law	-0.0375	-0.50	-0.0114	-0.15
α2 Regulatory Efficiency	0.0379*	0.50	0.0262	0.35
α3 Open Markets	-0.0181	-0.24	-0.0089	-0.12
Economic Environment				
α4 10yr Government Bond	0.0009	0.01	-0.0011	-0.01
α5 Credit Spread	0.0062**	0.08	0.0052*	0.07
α6 dGDP	-0.0122	-0.16	-0.0117	-0.16
Market Environment				
α7 dINDEX	-0.0018	-0.02	-0.0031	-0.04
α8 VIX	0.0000	0.00	0.0010	0.01
α9 Hotness Dummy	0.1066	1.41	0.0469	0.63
α10 Negative News Dummy	2.8190***	37.28	2.9050***	38.75
Offer Characteristics				
α11 Offer Size / Dummy	0.0003	0.00	0.0690	0.92
α12 Debt Retirement Dummy	-0.1549	-2.05	-0.2277	-3.04
α13 Intellectual Capital Dummy	0.0459	0.61	0.0627	0.84
α14 Private Equity Dummy	0.5183	6.85	0.4705	6.28
α15 Venture Capital Dummy	0.2291	3.03	0.2537	3.38
α16 Underwriter	0.0371**	0.49	0.0325	0.43
Firm Characteristics				
α17 Firm Size / Dummy	-0.0077***	-0.10	-1.2750***	-17.01
α18 Age / Dummy	0.0096	0.13	0.0529	0.71
α19 CapEx	0.0015	0.02	0.0008	0.01
α20 Net Income	-0.0005	-0.01	-0.0003	0.00
α21 Debt	-0.0015	-0.02	-0.0013	-0.02
α22 High-tech Dummy	0.0002	0.00	0.0218	0.29
α23 Multinationality	-0.1479	-1.96	-0.1466	-1.96
Corporate Governance Characteristics				
α24 Retained Ownership	-0.0011	-0.01	-0.0010	-0.01
α25 Lock-Up	-0.0024***	-0.03	-0.0026***	-0.04
α26 Board Size	0.1307	1.73	0.0939	1.25
α27 Board Independence	-0.0406***	-0.54	-0.0417***	-0.56
α28 Female Board Members	0.0077	0.10	-0.0005	-0.01
α29 CEO Duality	-6.0560	-80.09	-6.3840	-85.17
HL Statistic	4.08		9.01	
McFadden-R^2	0.2929		0.2829	

The dependent variable equals 1 for IPO withdrawals and 0 otherwise. Marginal Effects are defined as follows. The probit employs normalisation that fixes the standard deviation of the error term to 1 where each coefficient represents the marginal effect of a unit change on the probability that the dependent variable takes the value of 1 (IPO withdrawal) given that all other independent variables are constant (Aldrich and Nelson, 1984). The McFadden R-squared is defined as 1 less the log likelihood for the estimated model divided by the log likelihood for a model with only an intercept as an independent variable. While the Hosmer-Lemeshow Statistic represents the goodness of fit that observed events match estimated events in ten subgroups of the model population. The Scandinavian database includes 357 observations. Other goodness of fit variables for the probit regression using all 29 variables defined in Table 1 include the p-value HL 0.8503 and for the second regression using the dummy variables for firm size, offer size and firm age the p-value HL 0.3415.

Table 11: Determinants of IPO Withdrawal: Stepwise Probit Regression on full sample

	Probit Regression (Levels)		Probit Regression (Dummy Variables)	
Variable	Coef	Marginal Effect (pct)	Coef	Marginal Effect (pct)
Regulatory Environment				
α1 Rule of Law	-0.0144	-0.29	-0.0141	-0.34
α3 Open Markets	0.0469	0.14	0.0493	0.18
α Common Law Dummy	-0.5636	-2.66	-0.6143	-4.73
Economic Environment				
α4 10yr Government Bond	0.0780	0.00	-	-
α5 Credit Spread	-	-	0.0762	-0.01
α6 dGDP	9.1614	-0.01	8.8826	-0.01
Market Environment				
α8 VIX	0.0222	0.02	0.0200	0.02
α10 Negative News Dummy	0.9563	13.89	0.9379	14.26
Offer Characteristics				
α11 Offer Size	0.1244	0.01	0.3479	4.86
α12 Debt Retirement Dummy	0.2624	4.12	0.2460	3.74
α13 Intellectual Capital Dummy	-0.4307	-6.11	-0.4038	-5.84
α14 Private Equity Dummy	-	-	0.1891	1.81
α15 Venture Capital Dummy	0.3684	3.98	0.3892	5.68
Firm Characteristics				
α17 Firm Size	-0.1045	-0.01	-0.2981	-4.62
α21 Debt	-	-	0.0513	0.00
Corporate Governance Characteristics				
α25 Lock-Up	-0.0026	-0.04	-0.0026	-0.05
α27 Board Independence	-1.2641	-0.14	-1.2691	-0.14
α30 CEO Duality	-0.3470	-8.07	-0.3157	-7.79
HL Statistic	14.94		5.42	
McFadden-R^2	0.2614		0.2456	

The database includes 2808 observations. Other goodness of fit variables for the stepwise probit regression include the p-value HL 0.0604. This stepwise probit regression is executed at a 0.05 significance level and started off including all 30 variables outlined in Table 1. Other goodness of fit variables include the p-value HL 0.7124. This stepwise probit regression is including the variables outlined in Table 1 while using the dummies for firm size, offer size and age instead of the logarithmised values.

Table 12: Determinants of IPO Withdrawal - Extreme Bound Analysis

Variable	Normal Negative	Normal Positive	General Negative	General Positive
Intercept	0.08	99.92	7.36	92.64
Regulatory Environment				
α1 Rule of Law*	100.00	0.00	99.90	0.10
α2 Regulatory Efficiency	88.25	11.75	73.86	26.14
α3 Open Markets	14.88	85.12	38.44	61.57
Economic Environment				
α4 10yr Government Bond	42.86	57.14	46.42	53.58
α5 Credit Spread*	0.00	100.00	0.18	99.82
α6 dGDP	71.44	28.56	67.30	32.70
Market Environment				
α7 dINDEX*	99.94	0.06	99.53	0.47
α8 VIX*	0.00	100.00	0.01	99.99
α9 Hotness Dummy	84.37	15.63	80.42	19.58
α10 Negative News Dummy*	0.00	100.00	0.00	100.00
Offer Characteristics				
α11 Offer Size / Dummy*	0.00	100.00	0.01	99.99
α12 Debt Retirement Dummy*	0.00	100.00	0.00	100.00
α13 Intellectual Capital Dummy*	100.00	0.00	100.00	0.00
α14 Private Equity Dummy*	0.29	99.71	2.20	97.80
α15 Venture Capital Dummy*	0.18	99.82	0.25	99.75
α16 Underwriter	66.40	33.60	64.50	35.50
Firm Characteristics				
α17 Firm Size / Dummy*	99.00	1.00	81.82	18.18
α18 Age / Dummy*	0.93	99.07	6.40	93.60
α19 CapEx	61.45	38.56	61.25	38.75
α20 Net Income	17.80	82.21	20.14	79.86
α21 Debt*	0.22	99.78	0.24	99.76
α22 High-tech Dummy	76.68	23.32	72.97	27.03
α23 Multinationality	18.11	81.90	25.67	74.33
Corporate Governance Characteristics				
α24 Retained Ownership*	99.73	0.27	97.85	2.15
α25 Lock-Up*	100.00	0.00	100.00	0.00
α26 Board Size	20.75	79.26	32.15	67.85
α27 Board Independence*	100.00	0.00	100.00	0.00
α28 Female Board Members	86.38	13.62	78.84	21.17
α29 CEO Duality	91.97	8.03	86.09	13.91

Following Sala-I-Martin (1997) the Extreme Bound analysis identifies the extent to which each variable influences the probability on IPO withdrawal across 621,180 possible specifications. The EBA tests whether these variables retain statistical significance across 100,000 of estimated models. Variables marked with a * are statistically significant at a 0.05 significance level. Normal Negative/Positive represents the % of occurrences of the coefficient on the variable being negative or positive, given that the error terms are normally distributed. While General is the same, except with the error terms following a General Error Distribution.

Figure 1: Why Firms Withdraw from IPO's, Boeh and Dunbar (2013)

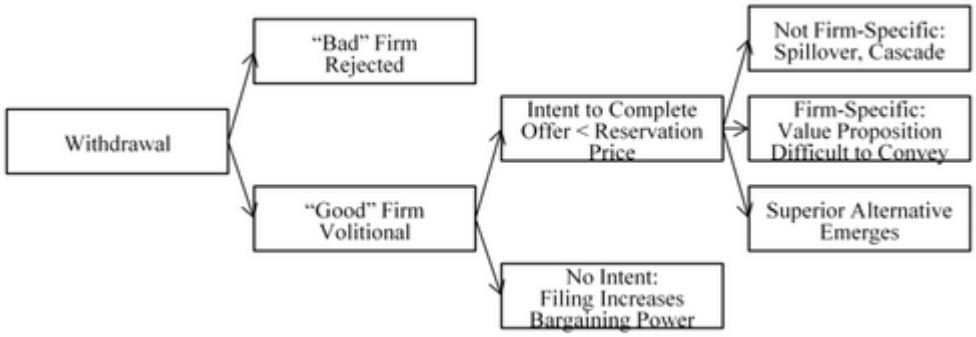
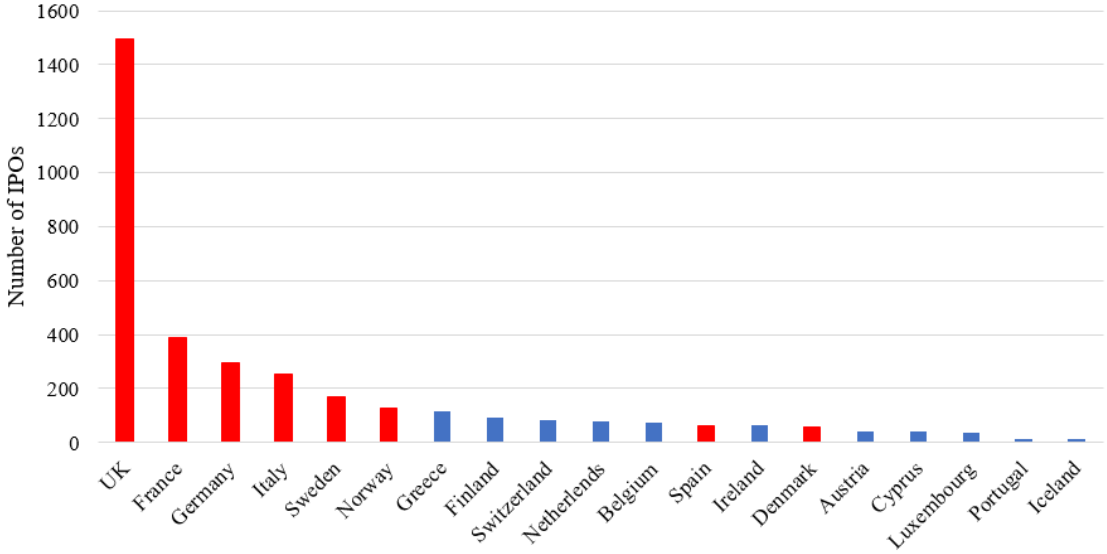
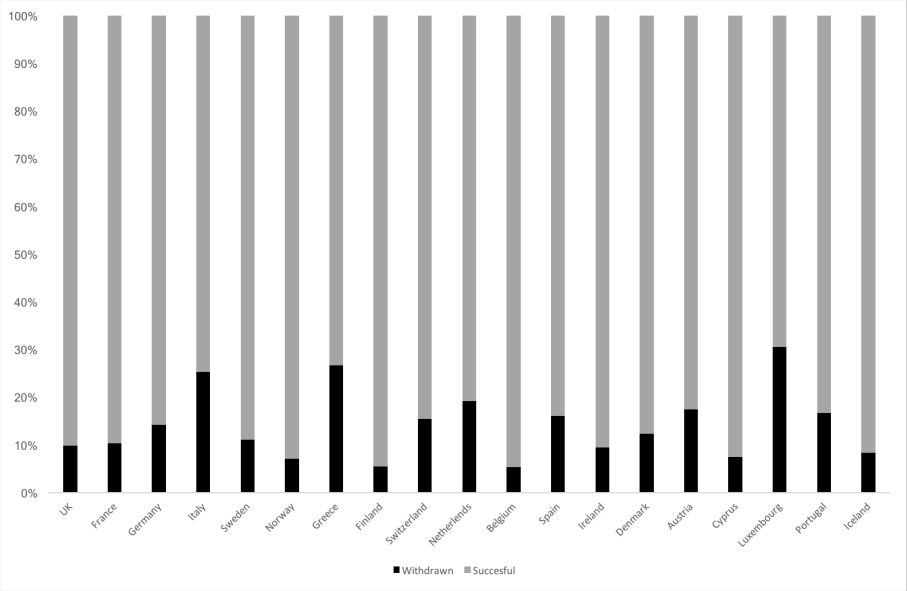


Figure 2: 82% coverage of Western European IPOs from 2001-2015. Source: Bloomberg



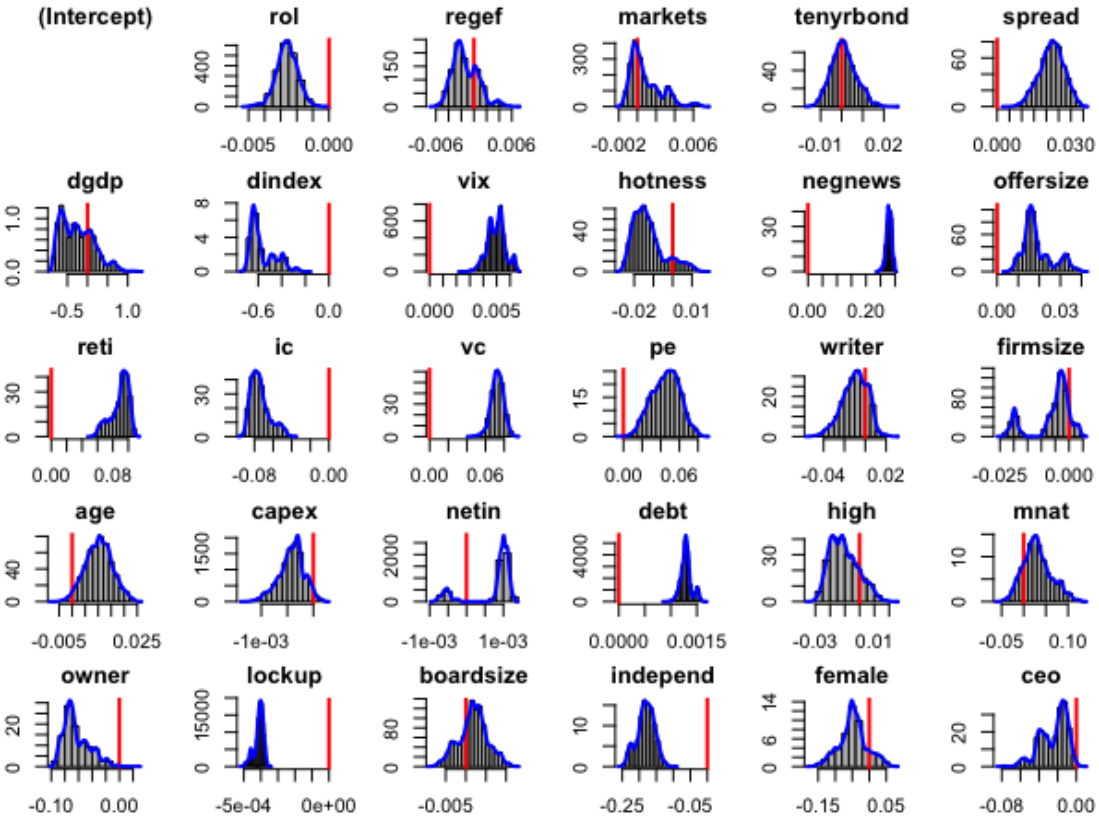
The chart shows the absolute numbers of IPO filings in Western Europe from 2001-2015. The red columns represent the collected IPO data covering 82% of Western European.

Figure 3: Percentage of listed vs. withdrawn IPOs



The chart shows the % distribution of companies, finally listed and withdrawn, by country in Western Europe from 2001-2015.

Figure 4: Extreme Bounds Analysis



Following Sala-I-Martin (1997) the Extreme Bound analysis identifies the extent to which each variable influences the probability on IPO withdrawal across 621,180 possible specifications. The EBA tests whether these variables retain statistical significance across 100,000 estimated models. The grey columns are the bins for the estimated coefficients, the red vertical line is at zero, facilitating easy visual inspection of the sign of the coefficient.