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The Determinants of IPO Withdrawal - Evidence from Europe

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Abstract

Why do companies not follow through with an IPO after filing for one? This question is investigated by examining common stock IPOs for the largest countries in Europe. We cover 80% of the Western European IPO market over the 2001-2015 period. We establish that the IPO phenomenon of withdrawal is a common feature of equity markets and identify key characteristics that influence the probability of withdrawal. Findings indicate that venture capital or private equity involvement, the presence of negative news, CEO duality, or the intent to retire debt *increase* the probability of IPO withdrawal. On the other hand, higher levels of corporate governance or trading volume *decrease* the pssrobability of IPO withdrawal. We argue that imminent agency conflicts and the lack of appropriate control mechanisms can force a company to withdraw from the IPO.

Keywords: Initial Public Offering, Europe, Withdrawal, Probit

JEL Codes : G14; G24; G32

1 Introduction

The key moment in a company's life cycle is to go public: to launch an Initial Public Offering (IPO). While the benefits are clear, the IPO decision itself is always costly, financially

and organisationally. Non-financial costs such as increased oversight, or scrutiny, for instance, can act as a significant deterrent to the filing of IPOs (Bessler et al., 2017). In the light of this tradeoff, certain planned IPOs may even end up withdrawn (Helbing, 2019). The IPO process is undoubtedly linked to agency conflicts in which potential investors and IPO insiders might come to diverging IPO valuations (Lo et al., 2017; Signori, 2018) Owen-Smith et al. (2015) argue that the process is influenced by a combination of status signalling and resource and information transfer. In the light of these aspects, the issuer reserves the option to change course at any time and withdraw the IPO before its completion (Busaba et al., 2001). As Boeh and Dunbar (2013) note, an IPO withdrawal is not necessarily a negative event. If the issuer has a superior option, withdrawing can be a positive outcome, and, having withdrawn a company can reissue. Research, however, shows that an IPO withdrawal reduces the probability and issue price of a second time IPO; indeed Dunbar (1998), Dunbar and Foerster (2008) and Lian and Wang (2012) find that issuers withdrawing their IPO are unlikely to reissue.

By studying both completed *and* withdrawn IPO filings we are in a better place to understand Initial Public Offerings. Completed IPOs tell us only part of the story (Busaba et al., 2015) To date, all research on the extent and determinants of IPO withdrawal has been conducted using US data, drawing an empirical conclusion for a globalised world based on a limited sample and on a single institutional framework. The determinants of an IPO withdrawal remain, therefore, opaque, especially where Europe is concerned. How can we understand the puzzles around Initial Public Offerings if we are unaware of 12% of the pieces? This 12% approximates the IPO withdrawal rate in a sample of 2,808 IPO filings in France, Germany, Italy, Scandinavia, Spain, and the United Kingdom between 2001 and 2015. This withdrawal rate is in stark contrast to the US, where the rate is more than twice as high at 30%; this difference is possibly explained by the fact that in Europe only a few, larger, capital markets attract IPOs. From 2001 to 2015 an aggregated amount of USD 563 bn and USD 529 bn was raised in initial public offerings in Western Europe and the USA, respectively. This demonstrates that Europe was the bigger IPO market in this time period, and that investment opportunities of an accumulated USD 151 bn (Europe) and USD 152 bn (USA) were foregone as a consequence of IPO withdrawal.

Our paper contributes to and complements the existing literature on IPOs and IPO withdrawal and, therefore, aims to advance research in these areas. First, we test various concepts in explaining IPO withdrawal in a European setting. Second, we document for the first time the

extent of IPO withdrawal vs listing for the main European countries within a new database unique in its extent and depth. Third, we extend the existing US based literature to a more heterogeneous setting, both geographically and qualitatively, by including a variety of hand collected variables not previously considered in the determination of the withdrawal decision.

Most companies that withdraw blame unfavourable market conditions, however, we identify IPO offer and corporate governance characteristics to be the main drivers of IPO withdrawal. In general, we argue that IPO withdrawal is a common feature of the main markets in Europe, just as it is in the US, while the determinants of withdrawal depend on the institutional and market setting. We argue that a further planned alignment in EU legislation will harmonise differences in the determinants of IPO withdrawal.

We find that, in Europe, Venture Capital (VC) and Private Equity (PE) involvement significantly *increases* the likelihood of withdrawal which is in stark contrast to previous findings for the USA (Busaba et al., 2001, Dunbar and Foerster, 2008). Furthermore, we find that the intent to retire debt with the IPO proceeds significantly *increases* the probability of withdrawal. Issuers that face negative news or have CEO duality prior to their IPO are more likely to withdraw. When insiders agree on longer lock-up periods as well as a higher level of board independence or disclose intellectual capital, issuers are more likely to follow through with the IPO. Better corporate governance characteristics *decrease* the probability of an IPO withdrawal, while the lack of appropriate control mechanisms *increases* the chance of withdrawal. The presence of a greenshoe option introduces price stability after listing and *decreases* the probability of IPO withdrawal. These symptoms are consistent with the theories of Jensen (1986) and Baker and Gompers (2003).

From a life cycle perspective, a larger firm size *decreases* the probability of withdrawal, whereas a larger offer size *increases* the probability. In terms of market timing characteristics we find that a higher level of Rule of Law *decreases* the probability of IPO withdrawal. Only in the UK do we find evidence indicative of a window of market timing opportunity based on the decreased trading volume for withdrawn IPOs. We argue, therefore, that imminent agency conflicts and the lack of appropriate control mechanisms can force a company to withdraw from the IPO.

The remainder of the paper is structured as follows: Section 2 describes the factors influencing IPO withdrawal and the European IPO setting, and Section 3 introduces the modelling

approach as well as the dataset. Empirical evidence for the determinants of IPO withdrawal from analysing market and firm level data are presented in Section 4. Finally, Section 5 concludes this paper with a brief summary and a discussion of the implications of this research.

2. The IPO withdrawal

Three closely intertwined theoretical threads exist when examining the determinants of IPO withdrawal: agency based, life cycle and market timing theories. The agency theory assumes inherent conflicts for IPO companies between the management, who control the firm's resources, and the potential shareholders, who own the firm's resources (Jensen and Meckling, 1976). The implied adverse selection and moral hazard issues in an Initial Public Offering can stop the process and must, therefore, be addressed and mitigated (La Porta et al., 2006). Latham and Braun (2010) suggest that managerial, firm, and environmental risk factors need to be examined in order to understand the decision behind IPO withdrawal. It can be assumed that the ultimate responsibility for the decision to withdraw from the IPO is that of the CEO despite the involvement of multiple other parties along the way to going public. Agency conflicts might arise between any financial intermediaries, the company, and the potential investors (Baker and Gompers, 2003) and these must be mitigated for if an IPO is to be successful.

Chemmanur and Fulghieri (1999) hypothesise that when a firm grows sufficiently large, it implies an IPO as the conclusive step in a company's life cycle since a more dispersed ownership is required; while the IPO marks the most important public information event, opening a two-way information channel. Zingales (1995) argues that by going public, insiders facilitate the acquisition of their company. In Europe, we find an interesting institutional setting with a combination of main markets and the Alternative Investment Market (AIM) in the UK. This second market provides small and young companies with a platform for raising funds to finance growth and advance in the life cycle (Vismara et al., 2012).

Under market timing theory, and assuming asymmetric information, the valuation of an IPO company is influenced by a variety of firm and non-firm specific characteristics (Allen and Faulhaber, 1989). Using the framework of Benveniste et al. (2002) on information revelation theory, we argue that signalling generally decreases a priori uncertainty about the success of an IPO company. While strong positive signals such as certification increase the aggregate demand

for the shares of the firm going public, negative ones decrease the same (Brau and Fawcett, 2006). Chemmanur and Fulghieri (1999) argue that companies that face higher uncertainty are intrinsically more difficult to value and therefore have higher evaluation costs. Not all companies trying to go public are successful, as the equilibrium offer price is noisy. Potential investors value the IPO company on a subjective *probability* of the expectation of future success and this evaluation is derived from a network of strong, weak, positive, and negative signals represented by firm and non-firm characteristics (Owen-Smith et al., 2015) Information transfers through signalling possess a key efficiency property since signalling incurs potential welfare costs. A reliable and credible signal must be too costly to be imitated by 'bad companies' (Leland and Pyle, 1977). 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)[1]. The IPO company and the underwriter trade-off the benefits and costs of information revelation (Sherman and Titman, 2002), but the IPO company could remain private if the potential investors incur significant information acquisition costs (Allen and Faulhaber, 1989). Edelen and Kadlee (2005) argue that underpricing an IPO decreases the probability of IPO withdrawal, as the issuer 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). This introduces an option like nature for the IPO withdrawal (Busaba, 2006).

As outlined in Figure 1, firms withdraw for a variety of reasons (Boeh and Dunbar, 2013). Over the last decade it has become more common for companies to operate a 'dual track' approach (see Field and Karpoff (2002) and Ewens and Farre-Mensa (2017), or more recently Greene (2016) and Aktas et al. (2018)) whereby, concurrent with the IPO filing, trade sale or private placement opportunities are sought (Boeh and Dunbar, 2016). In most cases the existence of a dual track approach is only observable ex post, typically defined as an instance whereby a withdrawn IPO is

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

sold in a trade sale within one year of the withdrawal. The post-withdrawal experience of IPO candidates has received limited attention; much of the research has been in the area of entrepreneurial finance; see Field and Karpoff (2002) and Brau et al. (2010). More recent work has begun to evaluate the afterlife of withdrawn firms, surfacing the determinants of different post-withdrawal outcomes (Boeh and Dunbar, 2013). Of course, prior to the evaluation of a taxonomy of post-withdrawal events, it is necessary to lay the groundwork with regards to the number, and determinants, of IPO withdrawal, and this is what our paper aims to do. To the best of our knowledge there is no documentation on European IPO withdrawal; we simply do not know what determines IPO withdrawal in Europe and can only infer from previous research which is, as discussed above, based in a different institutional and regulatory setting.

2.1. The European IPO setting

In Europe, and greatly in contrast to the USA, the 'event' of an IPO withdrawal is neither formally defined nor mentioned in European Union (EU) or country specific directives. This means that the event of an IPO withdrawal cannot be identified as to the exact date, therefore any event window is very blurry. Given the reporting environment, we can only infer the event after the IPO filing date.

Compared to the US, there are established differences in regulatory and financial market particularities in Europe (see online appendix for European regulatory development), although the issuance process is comparable between the US and Europe. Generally IPO companies in Europe are more diverse and older than in the US (Ritter, 2003, Ritter et al., 2013). There are only marginal numbers of foreign listings in European markets; the IPO market in Europe can be defined as a series of domestic markets with low competition between the different exchanges (Vismara et al., 2012). When examining the decision to go public, Bancel and Mittoo (2009) find that European CFOs, in contrast to American CFOs, value outsider monitoring and the enhanced visibility as well as financial flexibility when deciding to go public. In terms of costs that come with an IPO, Bancel and Mittoo (2009) argue that American CFOs seem more concerned about both the direct and indirect costs than their European counterparts.

It is important to note that, historically, the different European financial markets were driven by national desires. This resulted in a fragmented and inflexible financial regulatory environment with a variety of regulatory structures and legal systems. In an effort to create a seamless financial market for the European Union and Economic Area (EEA), minimum standards

were introduced through EU Directives. In 1999 the European Union initiated the Financial Services Action Plan (FSAP) in an attempt to create a single financial services market (Cumming et al., 2011). In particular, EU Directives such as 2001/34/EC or 2004/109/EC as well as the Markets in Financial Instruments Directive 2004 have shifted the focus of regulations to an alignment of investor protection and compatibility of stock exchanges to international market standards (Cattaneo et al., 2015). In line with La Porta et al. (2006), it is argued that the overall change of rule structure has mitigated insider trading and increased market liquidity (Cumming et al., 2011).

As listed in Table 1, the number of required regulatory documents for the Official List is highest in the UK, and the possibility of exceptions is most pronounced in France and Italy[2]. The EU Directives are intended to establish obligatory minimum requirements in the European Economic Area in terms of listing standards, including prospectus information, controlling bodies, and transferability. Admittedly, due to the nature of the EEA, these directives are positioned in a rather generalist way ensuring a maximum of flexibility to the individual countries. The general IPO regulation is respectively homogeneous, while the details on listing standards differ marginally; for instance corporate governance, timing, fees and liability are country-specific.

A more detailed analysis is provided in the online appendix. Our paper aims to provide further empiricial evidence, in the form of statistical analysis of IPO withdrawal, on the evolution of the integrative financial markets in Europe, with a focus on the harmonisation of regulatory standards, as well as country-specific financial customs. We hypothesis that further alignments in EU legislation would harmonise differences in the determinants of IPO withdrawal. In the last few years, the major European countries have aligned their listing requirements and standards and, as shown in Table 1, exhibit only low variability. We document that the phenomenon of IPO withdrawal is a common feature of the largest equity markets in Western Europe which exhibit similar determinants.

European equity markets, except for the UK, are more illiquid in nature than that of the US.

[2] See a discussion on listing standards, market liquidity and IPO quality in Johan (2010) or Takahashi and Yamada (2015). Vismara et al. (2012) note that the majority of IPOs in Europe are domestic apart from the AIM in the UK where foreign listings constitute only a marginal number.

The Continental European IPO markets can be considered especially volatile, and, in some parts, inopportune as evidenced in the numbers of IPOs (see Table 2).

European IPO activity has been declining, albeit not as drastically as in the USA due to the popularity of the second markets such as the AIM which provide the opportunity to undertake an IPO for growth and for smaller firms (Ritter et al., 2013)[3]. These second markets represent a demand-side segmentation and are organised as exchange-regulated markets where the company's Nominated Advisor must ensure compliance (Vismara et al., 2012). This implies that, formally, these second markets are not officially regulated through the European Financial Services Directives (Espenlaub et al., 2012).

2.2. Factors influencing IPO withdrawal

An emerging, but US centred, literature tests the determinants on the decision to withdraw, starting with Busaba et al. (2001). This is extended by Dunbar and Foerster (2008) who broaden the set of possible market and firm level explanatory variables. From these, and other papers examining IPO listings, we derive and identify a number of factors which may be relevant in the IPO withdrawal issue. The measures used to proxy these features are outlined in Table 3, and discussed in more detail in the online appendix.

We can break the characteristics hypothesised to impact IPO withdrawal into a number of sets representing market, offer, and firm characteristics. **Market characteristics** can then be further broken down into three subcategories. The predominant theoretical concept represented is based on market timing theories.

First, we consider the level of *regulatory environment* approximated by the country specific and time variant measures of the Rule of Law, Regulatory Efficiency, and the Market Openness Index provided by the Heritage Foundation as well as a Common Law Jurisdiction dummy variable which captures the differing international regulatory environments. It is argued

[3] Vismara et al. (2012) show that the majority of IPO companies at the AIM were not eligible for the main market.

that the market-friendly and standardised disclosure, as well as liability standards, are the main benefits of common law for equity markets (La Porta et al., 2006). La Porta et al. (1997) suggest that a higher level of political stability, as well as a better legal framework, can be considered 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 as it possibly reduces imminent agency conflicts in the IPO process (La Porta et al., 2006).

Second, we use the change in the country's quarterly Gross Domestic Product (ΔGDP), the monthly yield of ten-year government bonds, and the credit spread to represent *economic conditions* (Bergbrant et al., 2017). We expect a favourable economic environment and credit conditions to decrease the probability of IPO withdrawal.

Third, we examine equity *market conditions* since a multiplicity of research on market timing suggests that companies go public given favourable market conditions, therefore exploiting investor sentiment (Lowry, 2003). The change in the main stock market index (ΔIndex) signals positive information spillovers for potential issues. Since IPOs tend to come in waves (Nguyen Thanh, 2019), we examine a hotness dummy, as well as a trading volume dummy (Chemmanur and He, 2011). Recent research on market sentiment theorises that negative public news affects stock returns (Shi et al., 2016)[4]. Finally, we rely upon the end of the month market estimate of volatility (VIX) to further approximate investor sentiment (Busaba et al., 2015).

Firm characteristics can be categorised into three areas. First, the *offer characteristics* include the offer size and the intent to retire debt with the IPO proceeds. From an agency based perspective, leverage reduces managerial opportunism (Jensen and Meckling, 1976) while an overreliance on debt can manoeuvre the company into a competitive disadvantage (Wright et al., 2000). We anticipate that a proposal to use IPO proceeds for debt retirement is a negative signal as it lowers expectations about the future success of the IPO company and therefore increases the risk for the investor (Busaba et al., 2001).

IPO research differentiates on the offer share structure, and findings on the effect of primary and secondary shares are also not unanimous (Brennan and Franks, 1997). Klein and Li (2009) postulate that secondary shares send a negative signal as insiders cash out. In addition, we also include the greenshoe option in the offer structure. Greenshoe options are considered a

[4] The negative terms are defined by the LexisNexis Negative News Search. Please refer to the online appendix.

stabilisation mechanism for the underwriter who can in turn react with enhanced flexibility on price volatility (Benveniste and Busaba, 1997). Krigman et al. (2001) identify underwriter reputation as vital to the success of issues, this is supported by the findings of Dunbar and Foerster (2008) and Boeh and Southam (2011).

Another characteristic included is venture capital involvement as the VC sponsor potentially adds value to its portfolio firms through operational gearing (Cumming et al., 2016). Given the fragmented risk capital market in Europe, we additionally include Private Equity involvement since previous research has not differentiated this. Research findings are not unanimous; under the agency theory a conflict arises as the exit of dominant shareholders may not be in the best interest for the company (Baker and Gompers, 2003). Busaba et al. (2001) and Boeh and Southam (2011) identify VC backing as a certification of the IPO company as it reduces the probability of IPO withdrawal. Similarly, Dunbar and Foerster (2008) identify venture capitalist certification as key for a successful return to a successful second time IPO. The European PE and VC market is not as developed and institutionalised as in the US market (Bessler and Thies, 2006). Given the different institutional setting in Europe, agency conflicts are imminent between these financial intermediaries and possible investors. Tykvova and Walz (2007) posit that PE and VC companies have an information advantage over investors which they will exploit. We expect that PE and VC investors pursue the most beneficial of the multiple exit routes.

Finally, as Chemmanur and Fulghieri (1999) hypothesise, the cost of information production is essential in the IPO process. We expect that higher disclosure of the company's intangible assets or competitive advantage reduces the information asymmetry between the issuer and the potential investor and, in consequence, reduces the probability of IPO withdrawal [5]. In our analysis this is denoted as intellectual capital disclosure in the IPO prospectus (IC dummy) (Singh and van der Zahn, 2007).

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 Fawcet, 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

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

investor and consequently reduces the uncertainty about the firm value prior to the IPO. Given agency related concerns when contrasting managerial and organisational risk, an overreliance of debt can lead to a competitive disadvantage (Wright et al., 2000). We consequently propose a negative signal of debt to investors as companies with too high a degree 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.

The decision to undertake an Initial Public Offering boosts potential agency problems as the ownership becomes dispersed (Latham and Braun, 2010). Consequently, we include *corporate governance characteristics* in our analysis as investors are likely to demand signals that reduce possible agency issues. To proxy these the level of retained ownership by insiders after the IPO, the lock-up period, the board size and independence, as well as the proportion of female board members are presumed to decrease the probability of IPO withdrawal (Howton et al., 2001, Djerbi and Anis, 2015, Brav and Gompers, 2003, Gao et al., 2017, Wu and Hsu, 2018). CEO duality, a role combination of the chairman and CEO, is expected to increase the likelihood of IPO withdrawal (Bhagat and Bolton, 2008). Based on agency conflicts, CEO duality may cause additional monitoring costs and limit the board's oversight ability (McGuinness, 2016, Bertoni et al., 2014). In Europe, we have an interesting setting with regards to corporate governance; EU Directives are fostering harmonisation of national corporate governance codes, hence on the EEA level there is a remarkable degree of agreement (Akyol et al., 2014). Bertoni et al. (2014) suppose a differentiation of the board structure across the life cycle. With a resource-dependency for younger companies, corporate governance acts as value creation mechanisms, whereas the agency conflicts are more prominent with mature companies where corporate governance protects value. The average age of a company that files for an IPO in Europe is 16 years (22 years excluding the AIM), hence we expect the lack of adequate corporate governance mechanisms to result in a shortage of oversight and value protection. This idea is consistent with Bancel and Mittoo (2009) who document that outside monitoring is considered a major benefit of the equity market by European CFOs. A more detailed description of the variables can be found in Table 3 and in the online appendix.

3. Methods and Data

In light of the data and following academic convention, we employ a probit model to identify the determinants of IPO withdrawal (Busaba et al., 2011). We apply a binary model, where the dependent variable y is the event of an IPO withdrawal and takes the value 1 if the IPO is withdrawn and 0 otherwise, so that our basic model is defined as:

$$Pr(y_j \neq 0 \mid x_j) = \Psi(x_j \beta) \tag{1}$$

where x_j are the independent variables listed in Table 1 with their according β coefficient, and Ψ the cumulative normal distribution.

In order to interpret results, we consider the marginal effects (ME) of changes in x on the dependent variable y, expressed by a linear function ϕ:

$$ME = \frac{\partial Pr(y \neq 1 \mid x)}{\partial x} = \phi(x\beta)\beta \tag{2}$$

Equation 2 is slightly modified in the presence of dichotomous dummies and specified as:

$$ME = \left[\Psi(x\beta \mid x^k = 1) - \Psi(x\beta \mid x^k = 0) \right] \tag{3}$$

therefore focusing on differences in the assumption that all dummies equal either 0 or 1 under a given specification.

This paper examines all IPO filings in the UK, France, Germany, Italy, Spain, and Scandinavia from January 2001 to 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 retrieve the list of IPO filings from Bloomberg and validate the accuracy with the information provided by the respective stock exchange. The IPO prospectuses are downloaded from Bloomberg, Thomson Reuters, stock exchange or company websites, or from other public sources. Our dataset covers 82% of the Western European IPO market (see Figure 2) and consists

[6] Throughout the modelling process we tested for endogeneity in our estimates. In no case was endogeneity an issue, results are available on request.

[7] As a robustness check we exclude financial and state-owned enterprises from the sample. Our findings remain broadly unchanged, results are available on request.

of a total of 2,808 companies that filed for an IPO, of which 2,474 were successful and listed whereas 334 (11.89%) withdrew.

We use public sources such as Bloomberg and Thomson Reuters for economic and market specific characteristics but hand collect the majority of variables for the offer, firm, and corporate governance variables from the individual IPO prospectuses given the lack of available information in Europe. This makes our dataset unique in its extent, detail and depth.

The majority of IPO filings, in both number and volume, are from the UK which is as expected, given the Alternative Investment Market, with 1,454 successful and 147 withdrawn IPOs overall (about 50% of the sample), followed by France and then Germany. We start in 2001 for two reasons. First, this provides us with a sample period post the dot.com bubble, 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. As outlined, the EU Directive 2001/34/EC became effective as of early 2001, explicitly requiring minimum IPO listing requirements and regulatory standards for all countries in the European Economic Area for the first time.

There is considerable variation in the level of European IPOs and IPO withdrawal as depicted in Table 2. The wave like nature of IPOs over time is evident here. The number of companies that file for an initial public offering was highest between 2004 and 2007 with a peak of 366 IPO filings in 2005. In contrast, after the latest global financial crisis erupted, there were as few as 18 filings in all countries combined in 2009. 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 3 we show the country-specific extent of withdrawal and variation over the database. As a preliminary investigation Table 4 reports 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, indicating that market timing theories might justify IPO withdrawal. Successful IPOs are

associated with higher levels of regulatory environment metrics such as Rule of Law, Regulatory Efficiency or Common Law Jurisdiction which is consistent with expectation (La Porta et al., 1998). In line with Chemmanur and Fulghieri (1999), successful IPO listings are more frequent during 'hot' markets, where the market estimate for future volatility (VIX) and the credit market conditions are low. Market conditions, approximated by the change of the lead stock market index, GDP, or trading volume, are marginally positive for successful IPOs which support the idea of market timing (Benninga et al., 2005). In addition, market sentiment seems to have an effect: it is significantly more frequent that companies withdraw their IPO, than that it is successful, following negative news coverage giving rise to agency related issues.

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). While there seems to be no variation on the offer share structure for withdrawn IPOs, greenshoe options seem to be more frequent with filed IPOs. As anticipated, withdrawn companies display significantly higher mean levels of debt and are also more likely to use the IPO proceeds to retire outstanding debt. 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 in a shorter lock-up period. This is in accordance with Brav and Gompers (2003) who establish longer lock-up periods as a positive signal. Also, withdrawn IPOs have fewer independent board members. The lack of board independence is interpreted as an absence of a critical disciplining body of management; imminent agency conflicts might be perceived as risky by investors (Djerbi and Anis, 2015). We also find that corporate governance measures fail to act as a value protection mechanism (Bertoni et al., 2014)[8]. Finally, withdrawn issuers disclose 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

[8] We have excluded these findings from reportage here but results are available in the online appendix.

Table 5 provides results of the probit analysis. We report the probit coefficient estimates, the corresponding p-values and marginal effects[9]. The results of the probit regression are largely consistent with the findings from the descriptive statistics. At a 5% significance level we find that 21 variables show explanatory power on the probability to withdraw an IPO.

For ease of interpretation, Figures 4 and 5 illustrate the principal and secondary drivers of the IPO withdrawal which are significant at the 5% significance level.

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 scepticism 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 shown in Table 6. The presence of a greenshoe option introduces price stability after the IPO listing and decreases the probability of IPO withdrawal (Benveniste and Busaba, 1997). Disclosing intellectual capital in the prospectus decreases the probability of IPO withdrawal by almost 6% (van der Zahn et al., 2007). This reduces the information asymmetry between the potential investor and the insiders and, consequently, anticipated agency conflicts.

The intent to retire debt with the proceeds of the IPO imposes potential agency conflicts on the investor (Wright et al., 2000). This is confirmed by the probit findings suggesting that debt retirement increases the probability to withdraw by as much as 3% according to the marginal effects in Table 5. 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, most companies intend to

[9] The regressions appear reasonably well specified as shown in Table 5. The HL goodness of fit test and the Pseudo- r^2 suggest an adequate model.

rebalance their accounts with the IPO in Europe. Especially when considering the role of debt in Italy or Germany, banks exert substantial control over the firms such as holding voting rights and being represented on the supervisory board (Chirinko and Elston, 2006). Despite the potential benefits of bank concentrated ownership, control dilemmas are present in this construct (Elston and Rondi, 2006).

We find that VC and PE significantly and economically increase the probability of IPO withdrawal by almost 7% and 4% respectively. We propose two marginally competing explanations. First, VC and PE partners exploit market timing. Tykova and Walz (2007) and Chen and Liang (2016) argue that venture capitalists and private equity firms have an information advantage over investors; and, as a consequence, they are more likely to withdraw from the IPO for the benefit of a more favourable option (Cumming, 2008). But, it is interesting to examine what happened to the VC or PE backed company in our sample, after the IPO withdrawal. We evaluate the aftermath of the PE and VC backed IPO withdrawal companies and find that about 63% of private equity backed, and 57% of venture capital backed, companies engaged in a presumably superior alternative. This means that the target companies went public or were sold in a trade sale or secondary buyout[10]. Our empirical evidence suggests that PE and VC partners pursue a dual track approach and try to exploit market timing. In fact, Gill and Walz (2016) argue that an IPO with venture capital backing can be interpreted as a delayed trade sale. The empirical evidence is more pronounced for private equity backed IPO companies than for venture capital ones. Still, in half of the cases, there was no superior alternative, leaving some questions about the role of PE and VC in Europe. Second, on the contrary, we query the positive intrinsic value role of VC and PE involvement for Europe, considering the ineffective certification of VC in France, for example, (Chahine and Filatotchev, 2008) combined with the fragmented European market for risk capital (Goergen et al., 2009, Groh et al., 2010). We challenge possible imminent agency conflicts of VC and PE involvement for Europe. Compared to the US, in general, the European market for venture capital and private equity is still seen as lagging behind (see, for example, Bessler and Thies (2006) and more recently Bertoni et al. (2015))[11]. Particularly in France and Germany, the exit of VC or PE investors might not be in the best interest of the IPO company, as it imposes agency

[10] A supplemental analysis can be found in the online appendix.

[11] For a trade perspective on the persistent differences and relative lagging of the European markets see Levin (2016) and Basta (2017).

conflicts between minority and dominant owners (Baker and Gompers, 2003). This can be ascribed to the relatively lower level and complexity of PE and VC performance, reputation, and consistency in Europe as argued by Tykvova and Walz (2007). 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. While France and Italy score below average on the VC/PE attractiveness index, Germany scores average due to the bank-led capital market (Groh et al., 2010). 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. VC investment varies significantly in quality and, as such, a lack of control negatively affects the performance of investments and, therefore, the certification (Cumming, 2008)[12].

Consistent with previous findings, and in accordance with the life cycle framework, the larger the firm size, the lower the probability of IPO withdrawal (Busaba et al., 2001, Boeh and Southam, 2011), as information production costs are decreased (Chemmanur and Fulghieri, 1999). While a higher level of debt statistically increases the probability of IPO withdrawal, the economic impact is marginal, however this reinforces our suggestion about the role of debt in Europe. There are several market characteristics that are statistically significant, but have no economic impact (see Table 5). Only two market characteristics have an economic impact on the probability of IPO withdrawal. First, an increased trading volume around the filing of the IPO decreases the likelihood of IPO withdrawal by about 4%. This result is mainly driven by the UK as this is the only European country where the trading volume turns out to significantly influence IPO withdrawal. We conclude that there does exist some form of opportunity window in the UK, given its liquid stock markets. We do not find evidence for this in other European countries, arguably because of the illiquid nature of stock markets. Second, as suggested by the statistical results, 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 not surprising considering the importance of market sentiment and the effect of negative signals (Shi et al., 2016). Negative news stories are easily accessible through the public press. Potential investors can incorporate this information into

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

their expectation about the IPO company's future success, which might reveal further agency conflicts. This expectation is most likely lowered when a company is mentioned negatively in the news, as this potentially decreases reputation, sales, or in the worst case, reveals fraudulent behaviour.

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 finding 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. L:atham and Braun (2010) suggest that this is because appropriate control mechanisms being in place mitigates agency conflicts and reduces agency costs. The CEO duality dummy reduces the probability of IPO withdrawal by almost 5% which is contrary to expectation (Bhagat and Bolton, 2008). In Table 6 it becomes evident that the results seem to be driven by France. We offer two competing explanations to contextualise the negative correlation between CEO duality and likelihood of IPO withdrawal. Our findings might support the stewardship theory which we deem unlikely. Instead, we identify a more compelling answer within behavioural finance. We suggest that the CEO is pushing through the IPO despite potential higher costs associated with underpricing as the diligence and control mechanisms do not function properly when the role of CEO and chairman is combined (Bertoni et al., 2014). Boulton and Campbell (2016) find evidence that managerial overconfidence is associated with higher underpricing.

We then break the sample into country-specific elements. We can establish a pronounced alignment of the country-specific determinants of IPO withdrawal. Given the harmonised European regulatory environment this is as expected. Considering the country-specific results of the probit analysis for the UK, France, Germany, Italy, and Scandinavia in Table 6 it becomes clear that corporate governance metrics reduce the probability of withdrawal. Lock-up periods are important in most of Europe, except Germany where retained ownership appears to matter more, and all countries, except France, value board independence. As outlined, the disclosure of intellectual capital or competitive advantages mitigates information asymmetries (Singh and van der Zahn, 2007). 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 frequently, imposing a higher evaluation cost on the potential investors. Information disclosure can serve as a differentiator between good and bad firms.

In summary, 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, a higher trading volume and better corporate governance *decreases* same. As becomes evident, the country-specific determinants of IPO withdrawal overwhelmingly align with the consolidated results for the European determinants of IPO withdrawal.

As a robustness check[13], we run probit regressions using dummy variables (for further explanation/information refer to the online appendix), as opposed to logarithmic values, for firm size, offer size and firm age for the whole sample as well as the country specific sub-samples. The majority of variables are significant in both specifications for the European dataset, as well as for the country specific ones. This is consistent with regulatory efforts on the European capital markets integration, further information is available in the online appendix. We also run a probit regression excluding the UK and separating the AIM IPO filings as those IPOs constitute about 52% and 40% respectively of our sample data. The results in Table 5 indicate that the probit regression remains broadly unchanged. This also applies for the results we find when separating the AIM IPO filling in the UK specific regression. Further robustness checks can be reviewed in the online appendix.

4.2. Comparison with existing findings

As established earlier in the paper, we already know that there exist differences between the European and American IPO markets (Ritter, 2003, Ritter et al., 2013). Interestingly, we can identify different empirical manifestations when examining the phenomenon of IPO withdrawal. While most results for the largest European equity markets show similarities to US-based research, some of our findings are in contrast to Busaba et al. (2001) and Dunbar and Foerster (2008) and Boeh and Southam (2011). This does not consequently lead to an overthrow of the findings for the US equity market, but it leads to the conclusion that, while a feature in European and US equity markets, the phenomenon of IPO withdrawal needs to be examined within an institutional setting.

Dunbar and Foerster (2008), as well as Boeh and Southam (2011), find that successful IPO

[13] Given the large number of variables, we compute a correlation matrix which shows that multicollinearity is not present. Results are available on request.

companies have a significantly larger offer size when descriptively analysing the differences between successful and withdrawn IPOs. While it is argued that a smaller size is riskier (Busaba et al., 2001, Dunbar and Foerster, 2008), our results contradict these US-specific findings; withdrawn IPOs are of a significantly larger filing size. Busaba et al. (2001) find a positive relation between filing size and the probability of withdrawal.

The finding that is in starkest contrast to studies of the US market is the role that venture capitalist and private equity involvement plays. Busaba et al. (2001) find that VC involvement significantly reduces the probability of IPO withdrawal, in line with the certification hypothesis. Dunbar and Foerster (2008) identify venture capitalist involvement as key for a successful return to the equity market after IPO withdrawal. As discussed above, compared to the US, the European market for venture capital and private equity is still seen as lagging behind (Bessler and Thies, 2006). For half of the companies in our dataset that withdraw their IPO, we find that PE and VC investors are more likely to withdraw from the IPO for the benefit of a more favourable option (Cumming, 2008). We uncover further evidence to cast doubt on the causal mechanisms of certification proposed for the US consistent with Chahine and Filatotchev (2008)'s findings for France alone. Our empirical evidence suggests that PE and VC partners pursue a dual track approach and try to exploit market timing, giving rise to potential agency problems between the dominant and potential minority shareholder.

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

5. Conclusion

We analyse a dataset of all IPO filings from 2001 through 2015 in France, Germany, Italy, Scandinavia, Spain and the UK. New empirical and theoretical implications crystallise from our

results. Given the different regulatory and institutional setting, we postulate that Europe is different from the US when it comes to the level and determinants of IPO withdrawal. We do not find compelling evidence in favour of the market timing theory to explain IPO withdrawal. The level of trading volume and the presence of a greenshoe option *decrease* the probability of IPO withdrawal. The effect, however, is limited to the UK, the most liquid equity market in Europe. In line with life cycle ideas, a larger firm size reduces the probability that a company withdraws from the IPO. We find that market sentiment does matter since negative news about an issuer *increases* the probability of IPO withdrawal. Likewise, good corporate governance and the disclosure of intellectual capital reduce the probability of IPO withdrawal. We argue with managerial overconfidence in explaining why CEO duality *decreases* the likelihood of IPO withdrawal. We find that debt retirement, venture capital and private equity involvement significantly *increase* the probability of withdrawal which is driven by the German and French markets. We explain this phenomenon with the less advanced role of these in Europe compared to the US and with the dual track approach of VC and PE companies.

Drawing from the empirical evidence we can suggest the following theoretical implications of determinants of IPO withdrawal. First, we can reinforce 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 3. As to whether the IPO withdrawal itself is a negative or a positive signal, this must be uncovered in further investigations. Second, imminent agency conflicts and the lack of appropriate control mechanisms can force a company to withdraw from the IPO. Third, the dominance of firm-level determinants on the probability of withdrawal indicates that the life cycle theory is of importance. As firms grow, a more dispersed ownership from insiders is required, which is closely interlinked with potential agency conflicts (Chemmanur and Fulghieri, 1999(. Finally, we shed light on the differences and similarities of determinants of IPO withdrawal under the lens of European equity market integration. We argue that a further alignment in EU legislation will harmonise the differences in the determinants of IPO withdrawal.

Further evidence and research on the precise role played by VC and PE is required to surface the causal mechanisms. But what do the results presented here tell us? That the IPO process in a globalised world is too complex to be generalised by single country studies, and that the role of VC and PE involvement, especially, cannot be captured through broad generalisation.

Indeed, VC and PE involvement underlines the key question of the IPO withdrawal per se, as the IPO withdrawal themselves cannot be generalised. What happens with a company after it withdraws? Did the withdrawal lead to a better outcome for the company? Future research should focus on companies post-withdrawal and uncover new theories, such as that an IPO withdrawal backed by a VC or PE company might, after all, be a success dressed as a failure.

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Table 1: Differences in European Listing Requirements

	Business Activity	Market Capitalisation	Share Distribution	Working Capital	Corporate Governance
Denmark	At least three annual reports	At least million €1 million	Minimum 25% shares distributed to the public, each holding less than 10% of the shares	Sufficient working capital for at least 12 months	*compile or explain principle* with the Corporate Governance Code of Denmark
France	Two to three years financial audited accounts	At least € 2.5 million	Minimum 25% free float (5% if less than €5 million)	None	Recommendation of AFEP/MEDEF Corporate Governance Code
Germany	At least three annual reports and, if available, interm financial information	At least €1.25 million; Minimum 10,000 shares	None	None	German Corporate Governance Code, dual board system, exceptions for European Company (SE)
Italy	At least three annual reports, latest one is subject to audit	At least €40 million	Minimum 25 to 35% free float; 80% to institutional and 20% to retail investors	Sufficiency of working capital	Recommendation of Borsa Italiana S.p.A. Corporate Governance Code
Norway	At least three years of business	At least €1 to €40 million	Minimum 25% free float	Sufficient working capital for at	*compile or explain principle* with the Norwegian Code of

	activity			least 12 months	Practice for Corporate Governance
Spain	At least three annual reports	At least €6 million	Minimum 25% free float	None	*compile or explain principle* with the Spanish Corporate Governance Code
Sweden	At least three annual reports	At least €1 to €10 million	Minimum 10 to 25% free float	Sufficient financial resources for at least 12 months	Recommendation of the Swedish Corporate Governance Code
UK - Official List	At least three annual reports must represent at least 75% of its business	At least £ 700,000	Minimum 25% free float	Sufficient working capital for at least 12 months	*compile or explain principle* with the UK Corporate Governance Code
UK - AIM	Financial accounts not older than 18 months (audited), 15 months (unaudited), no minimum operating history	None	None	Sufficient working capital for at least 12 months proposed by company	UK Corporate Governance Code does not apply

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	2,474	88.11%	334	11.89%	2,808

Note: The database includes 2,808 observations from 2001 to 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 3a: Data Description and Sources - Regulatory, Economic, and Market Environment

Variable	Variable Name	**Source**	**Definition**	Predicted Effect
Regulatory Environment				
x_1	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.	Negative
x_2	Regulatory Efficiency	The Heritage Foundation	Provides annual data on how the regulatory efficiency is experienced by the general public including quantitative	Negative

			measures such as labour, business and monetary freedom.	
x_3	Market Openness	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.	Negative
x_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.	Negative
Economic Environment				
x_5	10 year Government Bond	Thomson Reuters Datastream	The basis points of the 10 year Government Bond yields are provided on a month end basis and approximate the cost of lending.	Negative
x_6	Credit Spread	Thomson Reuters Datastream	The end of the month difference between the 10 year Government Bond and the 1 year Government Bond yields signals the credit conditions.	Positive
x_7	ΔGDP – change of the Gross Domestic Product	Bloomberg	An aggregate measure of quarterly production equal to the sum of the gross	Negative

			values added of all resident, institutional units engaged in production. It provides information on the economic performance of a country.	
Market Environment				
x_8	VIX – Chicago Board Options Exchange SPX Volatility Index	Bloomberg	This index represents a market estimate of the future volatility. Month end measures are considered.	Positive
x_9	Δ Index – change of the stock market index	Bloomberg & Thomson Reuters Datastream	The monthly change of the corresponding main stock market index between the filling date and the prior month, providing information on the equity market (bull or bear market).	Negative
x_{10}	Hotness Dummy	Bloomberg	The rolling averages of the number of filings 180 days prior to the specific IPO filing date 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.	Negative
x_{11}	Trading Volume	Bloomberg	The rolling averages of the	Negative

	Dummy		trading volume 180 days prior to the specific IPO filing date are computed.* If the company files for an IPO during intensive trading, the dummy variable takes a value of 1 and 0 otherwise.	
x_{12}	Negative News Dummy	LexisNexis (handpicked)	If the IPO company is mentioned in the same paragraph with specific negative terms given by the LexisNexis Negative News Search one year prior to the IPO or withdrawal, the dummy takes the value of 1 and 0 otherwise.+	Positive

*: Indicates that the variable has been constructed back to 6 months prior to the IPO *filing* date.

+: Indicates that the variable has been constructed back to 12 months prior to the IPO *withdrawal* date.

Please refer to the Online Appendix for more details.

Table 3b: Data Description and Sources - Offer Characteristics

Variable	Variable Name	**Source**	**Definition**	Predicted Effect
Offer Characteristics				
x_{13_a}	Offer Size	Prospectus / Bloomberg	The natural logarithm of the company's offer size is computed.	Positive
x_{13_b}	Offer Size Dummy	Prospectus / Bloomberg	The 180 days rolling averages of the offer sizes prior to the IPO filling date are computed.* This dummy takes	Positive

			the value of 1 if the size of the offer is above average and 0 otherwise.	
x_{14}	Primary Shares	Prospectus	The percentage of newly created shares being sold in the IPO.	Negative
x_{15}	Secondary Shares	Prospectus	The percentage of existing shares being sold in the IPO.	Negative
x_{16}	Greenshoe Option	Prospectus	The percentage of extra shares that the underwriter is granted to sell additionally in the IPO depending on the demand.	Negative
x_{17}	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.	Positive
x_{18}	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.	Positive
x_{19}	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.	Positive
x_{20}	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.	Negative

x_{21}	Underwriter	Prospectus / Bloomberg	The underwriter reputation is classified according to the European ranking of 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.	Negative

*: Indicates that the variable has been constructed back to 6 months prior to the IPO *filing* date. Please refer to the Online Appendix for more details.

Table 3c: Data Description and Sources - Firm Characteristics

Variable	Variable Name	**Source**	**Definition**	Predicted Effect
Firm Characteristics				
x_{22_a}	Firm Size	Prospectus / Bloomberg	The natural logarithm of the company's total assets is computed.	Negative
x_{22_b}	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.	Negative
x_{23_a}	Age	Prospectus / Bloomberg	The natural logarithm of the company's age is computed.	Negative
x_{23_b}	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.	Negative
x_{24}	CapEx	Prospectus / Bloomberg	The position of capital expenditures is divided by the	Negative

			total assets of the IPO company to get the CapEx ratio.	
x_{25}	Return on Assets	Prospectus / Bloomberg	The position of net income is divided by the total assets of the IPO company to get the return on assets.	Negative
x_{26}	Leverage	Prospectus / Bloomberg	The position of total debt is divided by the total assets to compute the level of leverage of the IPO company.	Positive
x_{27}	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 definiton.	Positive
x_{28}	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.	Negative

Please refer to the Online Appendix for more details.

Table 3d: Data Description and Sources - Corporate Governance Characteristics

Variable	Variable Name	**Source**	**Definition**	Predicted Effect
Corporate Governance Characteristics				
x_{29}	Retained Ownership	Prospectus	The proportion of ownership in shares hold by insiders post IPO (Djerbi and Anis, 2015).	Negative
x_{30}	Lock-up	Prospectus	Number of days the pre-IPO owners agree not to sell their shares.	Negative
x_{31}	Board Size	Prospectus	This variable accounts for the absolute number of board members.	Negative
x_{32}	Board Independence	Prospectus	This variable accounts for the ratio of board members that have no link to the IPO company.	Negative
x_{33}	Female Board Members	Prospectus	This variable accounts for the ratio of female board members.	Negative
x_{34}	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.	Positive

Please refer to the Online Appendix for more details.

Table 4: Descriptive Statistics

	Successful IPOs		Withdrawn IPOs		
Variable	**Mean**	**SD**	**Mean**	**SD**	p-value successful vs. Withdrawn IPO
Regulatory Environment					
x_1 Rule of Law	81.82	11.10	78.15	13.88	0.0000

x_2 Regulatory Efficiency	79.35	5.95	78.47	5.89	0.0109
x_3 Market Openness	78.92	8.46	78.55	7.62	0.4533
x_4 Common Law	0.53	0.50	0.44	0.50	0.0025
Economic Environment					
x_5 10yr Government Bond	3.89	1.19	3.86	1.18	0.6443
x_6 Credit Spread	0.88	1.17	1.23	1.22	0.0000
x_7 ΔGDP	0.02	0.01	0.02	0.01	0.0737
Market Environment					
x_8 VIX	17.04	5.55	18.66	6.28	0.0000
x_9 ΔIndex	0.00	0.03	0.00	0.04	0.0003
x_{10} Market Hotness	0.63	0.48	0.58	0.49	0.0661
x_{11} Trading Volume	24.80	21.30	20.50	18.70	0.0005
x_{12} Negative News	0.07	0.25	0.31	0.46	0.0000
Offer Characteristics					
x_{13} Offer Size (mn)	175	2,529	505	2,913	0.0281
x_{14} Primary Shares	0.78	0.34	0.76	0.34	0.2100
x_{15} Secondary Shares	0.22	0.34	0.24	0.34	0.2724
x_{16} Greenshoe Option	0.05	0.08	0.04	0.08	0.0519
x_{17} Debt Retirement	0.14	0.35	0.27	0.45	0.0000
x_{18} Private Equity	0.16	0.37	0.24	0.43	0.0003
x_{19} Venture Capital	0.06	0.23	0.10	0.30	0.0033
x_{20} Intellectual Capital	0.34	0.47	0.19	0.39	0.0000
x_{21} Underwriter	0.24	0.26	0.25	0.27	0.7456
Firm Characteristics					

x_{22} Firm Size (mn)	1,683	16,821	6,645	59,782	0.0011
x_{23} Age (years)	16	26	22	34	0.0001
x_{24} CapEx	0.20	4.43	0.13	1.28	0.7780
x_{25} Return on Assets	-0.07	6.48	0.55	13.81	0.1700
x_{26} Debt	0.62	1.22	3.07	40.08	0.0025
x_{27} High-Tech	0.24	0.43	0.21	0.41	0.2878
x_{28} Multinationality	0.29	0.18	0.31	0.20	0.1832
Corporate Governance Characteristics					
x_{29} Retained Ownership	0.56	0.26	0.52	0.29	0.0033
x_{30} Lock-up (days)	251	175	127	165	0.0000
x_{31} Board Size	5.62	2.63	5.87	3.91	0.1160
x_{32} Board Independence	0.26	0.27	0.15	0.22	0.0000
x_{33} Female Board Members	0.09	0.14	0.09	0.15	0.5873
x_{34} CEO Duality	0.15	0.36	0.14	0.35	0.6840

Note: The database includes 2,474 observations of successful IPOs and 334 withdrawn IPOs. This table reports the means and standard deviations for 34 variables broken down by successful and withdrawn IPO filings. All variable definitions can be found in Table 1.

Table 5: Determinants of IPO Withdrawal

	Europe				**Continental Europe**			
	Levels		**Dummy Variable**		**Levels**		**Dummy Variable**	
Variable	**Coef.**	Marg. Effect %	**Coef.**	Marg. Effect %	**Coef.**	Marg. Effect %	**Coef.**	Marg. Effect %
Intercept	9.994	145.67	4.696	70.83	133.500	2,103.77	128.800	2,055.37

Regulatory Environment								
x_1 Rule of Law	-0.009**	-0.13	-0.010**	-0.15	-0.009*	-0.14	-0.009*	-0.15
x_2 Regulatory Efficiency	0.005**	0.07	0.004*	0.06	0.004	0.06	0.003	0.05
x_3 Market Openness	0.014***	0.20	0.016***	0.24	0.015***	0.24	0.017***	0.27
x_4 Common Law	-0.709***	-10.33	-0.751***	-11.32	N/A	N/A	N/A	N/A
Economic Environment								
x_5 10yr Gov. Bond	0.001**	0.02	0.001*	0.01	0.003***	0.05	0.003***	0.05
x_6 Credit Spread	0.001**	0.02	0.001**	0.02	0.001	0.01	0.001	0.01
x_7 ΔGDP	0.006**	0.09	0.006**	0.09	0.006*	0.09	0.006*	0.10
Market Environment								
x_8 VIX	0.003***	0.04	0.002***	0.04	0.002	0.03	0.001	0.02
x_9 ΔIndex	0.001*	0.02	0.001	0.01	0.001	0.02	0.001	0.01
x_{10} Market Hotness	0.081	1.18	0.075	1.13	-0.028	-0.43	-0.038	-0.60
x_{11} Trading Volume	-0.248***	-3.62	-0.239***	-3.60	-0.241**	-3.80	-0.235**	-3.75
x_{12} Negative News	0.897***	13.08	0.939***	14.17	1.064***	16.77	1.151***	18.37
Offer Characteristics								
x_{13} Offer Size (mn)	0.002***	0.03	0.375***	5.66	0.002***	0.03	0.396***	6.32
x_{14} Primary Shares	-0.015	-0.21	-0.008	-0.12	-0.269	-4.24	-0.260	-4.14
x_{15} Secondary	-0.015	-0.22	-0.008	-0.12	-0.269	-4.23	-0.259	-4.13

Shares								
x_{16} Greenshoe Option	-0.001***	-0.01	-0.001***	-0.01	-0.001***	-0.02	-0.001***	-0.02
x_{17} Debt Retirement	0.237**	3.46	0.226**	3.41	0.318**	5.02	0.354***	5.64
x_{18} Private Equity	0.264***	3.85	0.259***	3.90	0.217*	3.42	0.229*	3.65
x_{19} Venture Capital	0.488***	7.12	0.502***	7.57	0.663***	10.44	0.654***	10.43
x_{20} Intellectual Capital	-0.405***	-5.90	-0.395***	-5.97	-0.285**	-4.50	-0.277**	-4.42
x_{21} Underwriter	-0.001	-0.02	-0.001	-0.01	0.000	0.00	0.000	0.01
Firm Characteristics								
x_{22} Firm Size (mn)	-0.001***	-0.02	-0.298**	-4.50	-0.001***	-0.02	-0.467***	-7.45
x_{23} Age (years)	0.002	0.03	-0.082	-1.24	0.002	0.03	-0.068	-1.08
x_{24} CapEx	-0.002	-0.02	-0.001	-0.01	0.004	0.07	0.004	0.06
x_{25} Return on Assets	0.000	0.00	0.000	0.00	-0.001	-0.02	-0.001	-0.01
x_{26} Debt	0.002**	0.03	0.003***	0.04	0.000	0.01	0.001	0.01
x_{27} High-Tech	0.029	0.42	0.013	0.19	0.061	0.96	0.010	0.16
x_{28} Multinationality	0.030	0.44	0.047	0.71	0.039	0.61	0.066*	1.05
Corporate Gov. Characteristics								
x_{29} Retained	0.000	0.00	-0.001	-0.02	-0.003	-0.04	-0.004**	-0.07

Ownership								
x_{30} Lock-up (days)	-0.002***	-0.04	-0.002***	-0.04	-0.002***	-0.03	-0.002***	-0.03
x_{31} Board Size	-0.014	-0.21	0.007	0.10	-0.012	-0.19	0.015	0.24
x_{32} Board Independence	-0.018***	-0.26	-0.018***	-0.27	-0.014***	-0.23	-0.014***	-0.23
x_{33} Female Board Members	-0.003	-0.04	-0.001	-0.01	-0.004	-0.06	-0.002	-0.03
x_{34} CEO Duality	-0.342***	-4.98	-0.288***	-4.35	-0.724***	-11.42	-0.752***	-11.99
HL Statistic	16.592 (0.0347)		8.309 (0.4039)		3.722 (0.8813)		12.697 (0.1227)	
McFadden R^2	0.275		0.249		0.286		0.280	

Note: The dependent variable equals 1 for IPO withdrawal and 0 otherwise. *, ** and *** denote significance at 10%, 5% and 1% respectively. 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 the 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, with the p-value reported in brackets. The database includes 2,808 observations.

Table 6: Determinants of IPO Withdrawal - By Country

	United Kingdom				**France**				**Germany**				**Italy**				**Scandinavia**			
	Levels		**Dummy**		**Levels**		**Dummy**		**Levels**		**Dummy**		**Levels**		**Dummy**		**Levels**		**Dummy**	
Variable	**Coef.**	Mar	**Coef.**	Mar	**Coef.**	Mar	**Coef.**	Mar	**Coe**	Mar	**Coef.**	ME	**Coef.**	Ma	**Coef.**	ME	**Coef.**	Mar	**Coef.**	ME

		g. Effect %		g. Effect %		g. Effect %		g. Effect %	f.	g. Effect %		in %		rg. Effect %		in %		g. Effect %		in %
Intercept	1.303	15.58	0.725	9.14	-3.267	-33.53	2.179	24.38	-139.900	-1506.000	-139.300	-1420.71	1.252	13.38	1.494	15.73	-2.358*	-30.27	-3.205**	-40.68
Regulatory Environment																				
x_1 Rule of Law	0.021	0.25	0.021	0.27	-0.188**	-1.93	-0.129*	-1.44	0.099	1.07	0.189	1.93	-0.111	-1.18	-0.118*	-1.24	-0.067	-0.86	-0.053	-0.68
x_2 Regulatory Efficiency	-0.005	-0.06	-0.005	-0.07	0.032	0.33	-0.038	-0.43	0.046	0.50	0.021	0.22	-0.118	-1.26	-0.130	-1.37	0.053**	0.68	0.049**	0.62
x_3 Market Openness	0.008	0.10	0.015	0.19	0.064	0.65	0.033	0.37	-0.043	-0.47	-0.075	-0.76	-0.098	-1.05	-0.106	-1.12	0.000	0.00	0.014	0.17
Economic Environment																				
x_5	-0.00	-0.	-0.00	-0.	-0.01	-0.	-0.00	-0.	0.00	0.05	0.006	0.06	0.010	0.1	0.010	0.1	0.007	0.0	0.006	0.0

10yr Gov. Bond	4	04	5	06	3	13	7	07	5					1		0		9		7
x_6 Credit Spread	0.003	0.04	0.003	0.04	-0.0004	-0.04	-0.004	-0.04	0.003	0.03	0.006	0.07	0.008	0.09	0.001	0.01	0.012***	0.15	0.012***	0.15
x_7 ΔGDP	0.017	0.20	0.022	0.27	0.049	0.51	0.067	0.75	0.011	0.12	0.004	0.04	0.014	0.15	0.005	0.005	-0.007	-0.08	-0.003	-0.04
Market Environment																				
x_8 VIX	0.004**	0.04	0.003**	0.04	0.008	0.08	0.000	0.00	0.007	0.08	0.006	0.06	0.002	0.02	0.007	0.07	0.003	0.04	0.005	0.06
x_9 ΔIndex	0.006	0.07	0.005	0.06	0.007	0.07	0.004	0.04	0.006	0.07	0.007	0.07	0.006	0.07	0.011	0.12	0.000	0.00	-0.001	-0.01
x_{10} Market Hotness	0.098	1.18	0.068	0.86	-0.273	-2.80	-0.133	-1.49	-0.631	-6.79	-0.996*	-10.16	-0.556	-5.95	-0.347	-3.66	0.224	2.88	0.237	3.01
x_{11} Trading Volume	-0.264**	-3.16	-0.258**	-3.25	0.035	0.36	0.060	0.67	-0.436	-4.70	-0.341	-3.48	-0.266	-2.85	-0.198	-2.09	-0.073	-0.94	-0.028	-0.35
x_{12}	0.828	9.9	0.843	10.	0.980	10.	0.904	10.	1.32	14.2	1.535	15.6	1.653	17.	1.944	20.	2.911	37.	2.975	37.

Neg. News	***	0	***	63	***	06	***	12	1***	2	***	5	***	68	***	47	***	37	***	76
Offer Characteristics																				
x_{13} Offer Size (mn)	0.002***	0.03	0.372**	4.68	0.0123***	0.13	0.986***	11.04	0.005	0.05	0.419	4.27	0.001	0.01	-1.032*	-10.86	0.002	0.02	0.194	2.46
x_{14} Primary Shares	-0.008	-0.10	-0.0066	-0.08	0.014	0.14	-0.0100	-0.11	0.999	10.75	0.991	10.10	0.003	0.03	0.005	0.05	-0.001	-0.01	0.000	0.00
x_{15} Secondary Shares	-0.009	-0.11	-0.007	-0.09	0.015	0.16	-0.008	-0.09	0.997	10.73	0.990	10.09	0.012	0.13	0.016	0.17	N/A	N/A	N/A	N/A
x_{16} Greenshoe Option	-0.002	-0.03	-0.003	-0.03	-0.002	-0.02	0.000	0.000	-0.008**	-0.09	-0.011**	-0.11	-0.018**	-0.19	-0.018**	-0.19	-0.002	-0.03	-0.002	-0.03
x_{17} Debt Retirement	0.238	2.85	0.142	1.80	0.555*	5.69	0.669**	7.49	0.965**	10.39	1.111**	11.33	0.762*	8.15	1.009**	10.63	-0.248	-3.18	-0.437	-5.55
x_{18}	0.3	3.	0.2	3.	0.1	1.	0.3	4.	0.	7.	0.7	7.	-0.	-	0.0	0.	0.5	6.	0.5	6.

Private Equity	30	95	66*	35	81	86	62	05	664*	14	18*	32	006	0.06	83	87	35	87	49	97
x_{19} Venture Capital	0.444**	5.531	0.461**	5.81	0.685	7.03	0.851*	9.53	2.635***	28.36	2.769***	28.23	1.177*	12.58	1.482*	15.60	0.167	2.14	0.159	2.02
x_{20} Intellectual Capital	-0.957***	-11.45	-0.925***	-11.65	-0.686**	-7.04	-1.002***	-11.21	-0.274	-2.95	-0.123	-1.26	-0.930*	-9.94	-0.939**	-9.89	0.085	1.09	0.164	2.08
x_{21} Underwriter	0.001	0.01	0.000	0.00	-0.012*	-0.12	-0.007	-0.08	0.009	0.10	0.013	0.14	0.020*	0.21	0.027**	0.29	0.081	1.04	0.061	0.78
Firm Characteristics																				
x_{22} Firm Size (mn)	-0.002***	-0.03	0.017	0.22	-0.001	-0.01	0.030	0.33	-0.004*	-0.05	-1.452***	-14.80	0.006	0.06	0.489	5.15	-0.009***	-0.12	-1.404***	-17.82
x_{23} Age (years)	-0.001	-0.01	-0.156	-1.97	-0.010	-0.11	-0.504	-5.63	-0.005	-0.05	-0.641	-6.53	0.000	-0.01	0.844*	8.88	0.006	0.08	0.018	0.22
x_{24} Cap Ex	-0.010*	-0.1	-0.007	-0.0	-0.008	-0.0	-0.006	-0.0	0.074*	0.80	0.063**	0.64	-0.132*	-1.4	-0.128*	-1.3	0.015	0.20	0.014	0.18

		2		9		9		7	**		*		*	1	*	5				
x_{25} Return on Assets	0.001	0.01	0.001	0.01	-0.003	-0.04	-0.002	-0.02	-0.002	-0.03	0.003	0.04	0.014	0.15	0.022	0.23	0.001	0.01	0.002	0.03
x_{26} Debt	0.003**	0.04	0.004***	0.05	0.005	0.05	0.000	0.000	0.003	0.04	0.006	0.06	0.007	0.07	0.009	0.10	-0.004	-0.05	-0.002	-0.03
x_{27} High-Tech	0.071	0.84	0.100	1.26	-0.116	-1.19	-0.169	-1.89	-0.332	-3.57	-0.424	-4.32	-0.002	-0.03	-0.001	-0.01	0.116	1.49	0.161	2.04
x_{28} Multinationality	0.045	0.54	0.035	0.44	0.066	0.67	0.104	1.16	0.186*	2.00	0.287***	2.93	-0.097	-1.04	-0.079	-0.83	-0.150	-1.92	-0.158	-2.00
Corp. Gov. Characteristics																				
x_{29} Retained Ownership	0.003*	0.04	0.002	0.03	-0.008	-0.08	-0.011*	-0.12	-0.012*	-0.12	-0.014**	-0.14	-0.014	-0.15	-0.019	-0.20	0.001	0.01	0.000	0.00
x_{30} Lock-up (days)	-0.003***	-0.03	-0.003***	-0.03	-0.005***	-0.05	-0.003**	-0.04	-0.001	-0.01	-0.001	-0.01	-0.005***	-0.05	-0.006***	-0.06	-0.002**	-0.03	-0.002**	-0.03

x_{31} Board Size	-0.002	-0.003	-0.004	-0.004	-0.130**	-1.334	-0.075	-0.083	0.064	0.68	0.1105**	1.07	0.017	0.18	-0.004	-0.04	0.154**	1.98	0.147*	1.86
x_{32} Board Independence	-0.043***	-0.552	-0.049***	-0.61	-0.029	-0.29	-0.031	-0.34	-0.030*	-0.32	-0.037**	-0.38	-0.027	-0.29	-0.022	-0.23	-0.052***	-0.66	-0.053***	-0.68
x_{33} Female Board Members	0.003	0.04	0.007	0.09	-0.010	-0.10	-0.015	-0.17	-0.034	-0.36	-0.003	-0.03	-0.047*	-0.50	-0.046	-0.48	0.028	0.36	0.025	0.31
x_{34} CEO Duality	0.119	1.43	0.149	1.88	-0.639***	-6.56	-0.616**	-6.89	N/A	N/A	N/A	N/A	-0.302	-3.23	-0.503	-5.29	-5.775	-74.14	-5.610	-71.22
HL Statistic	8.457 (0.3901)		11.775 (0.1616)		1.577 (0.9913)		12.636 (0.1250)		71.612 (0.0000)		35.253 (0.0000)		1.470 (0.9932)		1.367 (0.9947)		4.021 (0.8553)		8.953 (0.3463)	
McFadden R^2	0.335		0.299		0.409		0.359		0.534		0.561		0.649		0.656		0.308		0.313	

Note: The dependent variable equals 1 for IPO withdrawal and 0 otherwise. *, ** and *** denote significance at 10%, 5% and 1% respectively. 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 the 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, with the p-value reported in brackets. The database includes 2,808 observations.

Figure 1: A Taxonomy of Withdrawal Theories, Boeh and Dunbar (2013)

Figure 2: Coverage of our Hand Collected IPO Data

Figure 3: Percentage of listed vs. withdrawn IPOs

Figure 4: Prinicpal Determinants of IPO Withdrawal

Figure 5: Secondary Determinants of IPO Withdrawal

Appendix - Data Description and Sources

We provide an extension to Table 1 in order to describe the database creation process and to shed more light on the data and the sources. Given poor information quality for European IPO filings from 2001 to 2015, we construct our own database to assure data reliability which makes this study unique in its extent and depth of information on IPO filings and IPO withdrawal in Europe. We retrieve the list of IPO filings as well as the status of the listing from Bloomberg and validate the accuracy with the information provided by the respective stock exchanges. We categorise the status of the listing into successful which means that the IPO company listed, regardless if public trading develops; and withdrawn which entails that the IPO company did not issue shares despite its intent. In contrast to the USA, the event of an IPO withdrawal is not formerly defined or mentioned in EU or country-specific directives. This means the event of an IPO withdrawal cannot be linked to an exact date. One minimum listing requirement is generally audited accounts that are

not older than two years. Henceforth, we can categorise a pending IPO filing as withdrawn after two years. In some cases, we can also infer the IPO withdrawal from the information provided by the stock exchanges, Bloomberg, Thomson Reuters or through news articles in the LexisNexis database. That is the primary reason why we cannot posit an exact IPO withdrawal date as any event window is rather blurry and inconsistent. IPO prospectuses are downloaded from Bloomberg, Thomson Reuters, stock exchange websites or through other internet sources. Based on these data, our data frame consists of a total of 2,808 companies that filed for an IPO between 2001 and 2015, of which 2,474 were successful and listed whereas 334 (11.89%) withdrew. Our dataset covers 82% of the Western European IPO market. We arrange the variables in our dataset into six environments: Regulatory, Economic, Market, Offer, Firm, and Corporate Governance. We use monthly observations, due to data restriction in Europe.

The **Regulatory Environment** includes yearly changing data on the country-specific Rule of Law, Regulatory Efficiency, and Open Markets. This information is provided by the Heritage Foundation[14] and captures the overall regulatory environment in a given year and country. Rule of Law describes the perception by the general public of law enforcement (property rights, freedom from corruption etc.) in the given country. Regulatory Efficiency is an estimate of how this is experienced by the general public including dimensions such as labour, business, and monetary freedom. Market Openness describes how the openness of markets is perceived by the general public considering trade, investment, and financial freedom. The countries in our database experience yearly changes and differences. A Common Law dummy is also included where the value of 1 is assigned to countries in common law jurisdiction and 0 otherwise.

The **Economic Environment** includes monthly variables such as the 10 year Government Bond, the Credit Spread, and the quarterly change of the Gross Domestic Product. Monthly basis points for country-specific 10 year Government Bonds approximate the cost of lending. We define the respective Credit Spread as the difference in basis points between the 10 year and the 1 year Government Bond yield in the month of the corresponding IPO filing. The change of the Gross Domestic Product is provided on a quarterly basis and is the aggregated measure of production equal to the sum of the gross values added of all residents and institutional units engaged in production. The two points in time for the GDP are quarterly changes between the quarter of the IPO filing date and the previous quarter.

[14] https://www.heritage.org/index/

The **Market Environment** includes monthly variables such as the VIX. The Chicago Board Options Exchange SPX Volatility Index implies the market estimate of future volatility. Given that there is no equivalent index in Europe, we rely on the VIX arguing that equity markets are contagious. The monthly change of the main stock market index is a country-specific variable and reflects changes in equity prices of the country where the IPO is filed. In regard to the two points in time for the market index, we rely on monthly changes between the month of the IPO filing date and the previous month. The following market indices are used: for France the CAC 40 Index, for Germany the DAX, for Italy the FTSE MIB, for Spain the IBEX 35 and for the UK the FTSE 100 is used. The monthly Hotness Dummy indicates the number of IPO filings in the specific country. The Trading Volume Dummy measures the monthly trading volume of the country-specific main stock market index. Both dummies are created as follows: the country-specific rolling averages of the number of filings (Hotness) or of the trading volume 180 days prior to the month of the IPO filing are computed. If the IPO filing takes place in a month where there is a higher number of IPO filings than the 180 days average, the company faces higher competition and the Hotness Dummy takes the value of 1. This dummy is not complimentary to a coldness dummy. If the IPO filing is in a month with higher than average trading volume, the Trading Volume Dummy takes the value of 1. Finally, the Negative News Dummy takes the value of 1 if the IPO company is subject to negative news one year prior to the IPO filing month. Here we use of the LexisNexis database including main international and national newspapers, practitioner journals, and announcements. LexisNexis provides negative terms and we manually search for the appearance of the IPO company in connection with those negative terms in English as well as the country-specific language. We translate the negative search string code to the respective language for France, Germany, Italy and Spain. [15]

The **Offer Characteristics** are hand collected from the IPO prospectus. We account for the Offer Size with the logarithmised offer size value while also creating an Offer Size Dummy to mitigate possible inflation influences. The 180 days rolling average of the country-specific offer sizes is computed where the Offer Size Dummy takes the value of 1 if the firm specific offer size value is larger than the average. The offer structure is approximated with the percentage of newly

[15] The code for the English LexisNexis negative terms is available here: `http://help.lexisnexis.com/tabula-rasa/lninexis/searchnegativecompanyinfo_hdi-task?lbu=GB&locale=es_ES&audience=business`.

created shares for the IPO represented by Primary Shares, while the percentage of existing shares being sold in the IPO are measured by the Secondary Shares. The percentage of the extra shares to the total shares offered in the IPO is measured with the Greenshoe Option. The Debt Retirement Dummy accounts for the intention of the IPO company to use the IPO funds to deleverage, and takes the value of 1 if this is stated in the IPO prospectus or otherwise. The Intellectual Capital Disclosure Dummy accounts for supplemental information provided by the IPO company. It takes the value of 1 if the company discloses its competitive advantage, patents, licenses or any other form of intellectual capital in the IPO prospectus. The Private Equity likewise Venture Capital Dummy takes the value of 1 if the IPO company is backed by private equity or venture capital respectively during the IPO filing. The Underwriter variable measures the underwriters' reputation in the European countries using the Vismara (2014) list which ranges from 0 to the highest reputation of 1.

The **Firm Characteristics** are hand collected from the IPO prospectus. We account for the Firm Size with the logarithmised firm size value while also creating a Firm Size Dummy to mitigate possible inflation influences. The 180 days rolling average of the country-specific firm sizes is computed where the Firm Size Dummy takes the value of 1 if the specific firm size value is larger than the average. The Age is measured through the natural logarithm of the IPO company's age since foundation. We also create an Age Dummy alike the other dummies. The 180 days rolling average of the country-specific age is computed where the Age Dummy takes the value of 1 if the IPO company is older than the sample average. The Capital Expenditure is a ratio of the position of capital expenditure to the total assets of the IPO company. The Return on Assets is ratio of the IPO company's net income to total assets. Debt is the ratio of total leverage to total assets. The High-Tech Dummy takes the value of 1 if the IPO company is categorised as high-tech based on the Eurostat NACE code. Finally, the degree of Multinationality is measured by the scale of Aggarwal et al. (2011) which includes for instance foreign assets or the revenue created abroad. The scale differentiates between seven categories of multinationality where the highest level of all classification is 1.

The **Corporate Governance Characteristics** are hand collected from the IPO prospectus and approximate the potential agency conflicts inherent in a public company post the IPO. We include Retained Ownership which is the proportion of ownership in shares hold by insiders post IPO, in other words: how much control do insiders retain. The Lock-Up period is measured in days

and accounts for the period that insiders agree to not dispose of any shares. The Board Size measures the total number of members on the board post the IPO. Board Independence is the ratio of defined independent board members that do not have a link to the IPO company. The variable Female Board Members measures the ratio of female board members post the IPO. The CEO Duality Dummy takes the value of 1 if both the roles of CEO and chairman reside with the CEO of the IPO company.

Highlights

- IPO withdrawal has been relatively understudied
- We extend the limited research from the US to the European setting and much forward in time
- We surface significant new evidence of the role of Venture Capital in a different institutional setting to heretofore
- We also find new evidence on the role board structure

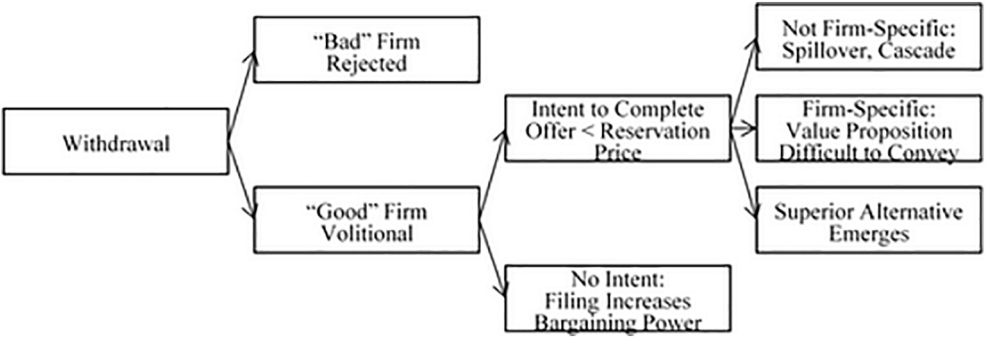
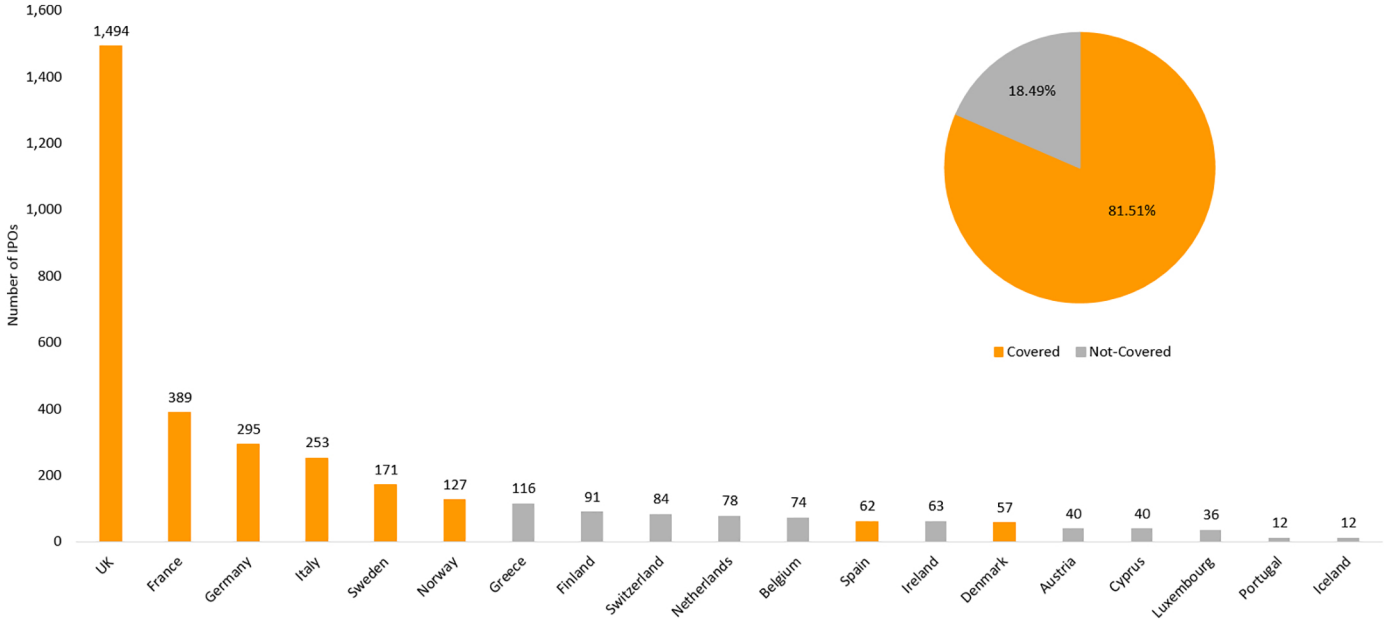

Withdrawal
"Bad" Firm Rejected
"Good" Firm Volitional
Intent to Complete Offer < Reservation Price
No Intent: Filing Increases Bargaining Power
Not Firm-Specific: Spillover, Cascade
Firm-Specific: Value Proposition Difficult to Convey
Superior Alternative Emerges

Figure 1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171
127
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84
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62
63
57
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40
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12
12
UK
France
Germany
Italy
Sweden
Norway
Greece
Finland
Switzerland
Netherlands
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Denmark
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Cyprus
Luxembourg
Portugal
Iceland
18.49%
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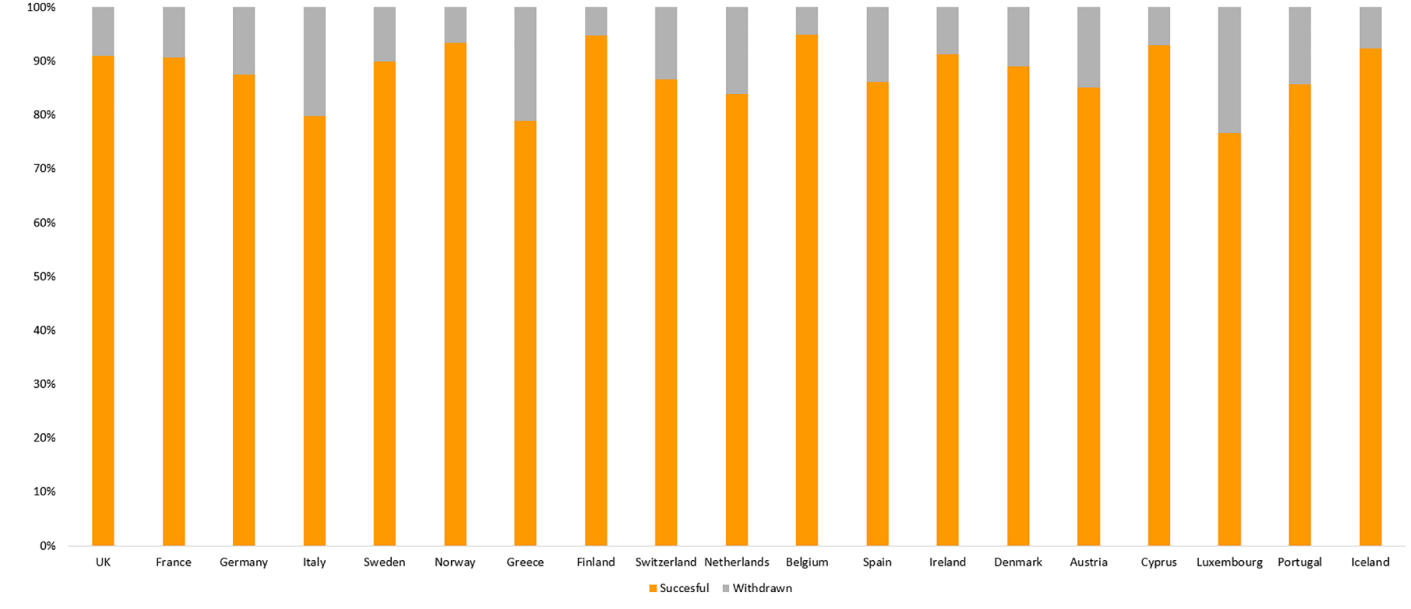
Not-Covered

Figure 2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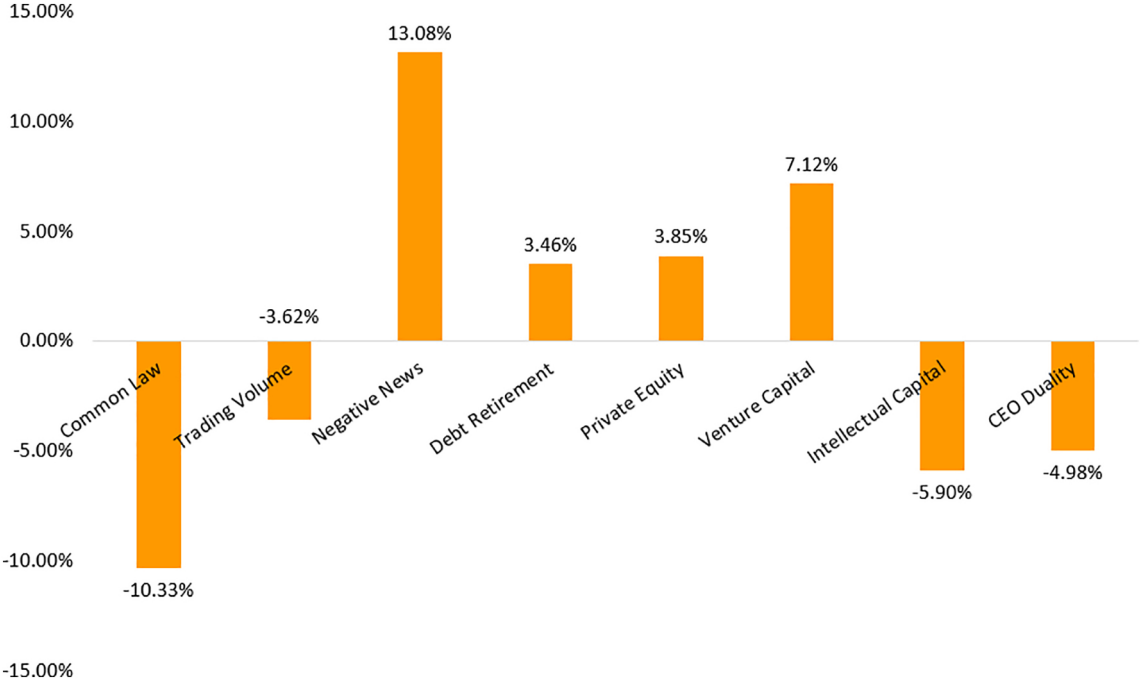
Portugal
Iceland
Succesful
Withdrawn

Figure 3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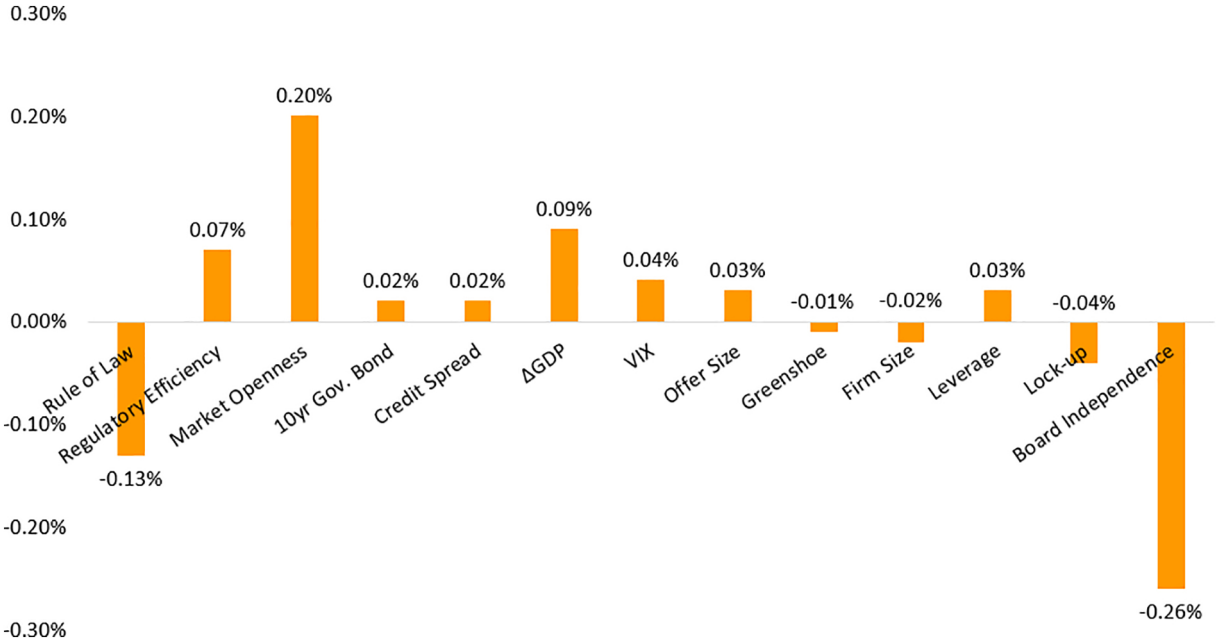
Common Law
Trading Volume
Negative News
Debt Retirement
Private Equity
Venture Capital
Intellectual Capital
CEO Duality

Figure 4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0.03%
-0.04%
-0.26%
Rule of Law
Regulatory Efficiency
Market Openness
10yr Gov. Bond
Credit Spread
ΔGDP
VIX
Offer Size
Greenshoe
Firm Size
Leverage
Lock-up
Board Independence

Figure 5