

The Exit Choices of European Private Firms: A Dynamic Empirical Analysis

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Abstract

Using a large dataset of European private firms, we undertake a dynamic empirical analysis of their exit decisions, previously modeled as a one-time choice between IPOs and acquisitions. We use a sequential logit analysis to study how post-IPO considerations, such as the benefits from potential post-IPO acquisitions at higher valuations and the costs from potential post-IPO delistings at lower valuations, alter private firms' initial exit trade-off between IPOs and acquisitions. Our analysis generates several new insights regarding the drivers of private firms' exit decisions in the European setting, and quantify the benefits and costs to firms under alternative post-IPO scenarios.

1. Introduction

The choice between IPOs and acquisitions as exit mechanisms for private firms has recently received considerable attention, both among academics and practitioners. Part of the reason for the above interest is due to the fact that, in recent years, a private firm has been much more likely to be acquired than to go public: see, e.g., Gao, Ritter, and Zhu (2013) who show the significant decline in the number of IPOs in the U.S. over the last decade. Existing empirical analyses of IPOs versus acquisitions treat private firms' exit decisions as a one-time choice between the two (Brau, Francis and Kohers, 2003; Poulsen and Stegemoller, 2008; Chemmanur et al., 2012). However, in reality, a significant proportion of firms (roughly 17%) first go public and are then acquired within three years of their IPO. Further, another significant fraction of firms may be delisted not long after IPO. If firms making their initial exit choice between IPOs and acquisitions factor in the above possibilities of being acquired or delisted subsequent to an IPO, this may modify their initial trade-off between the various factors driving their initial exit decision. In other words, the choice between IPOs and acquisitions may be a dynamic rather than a one-time decision. The objective of this paper is to empirically analyze the above dynamic choice between IPOs and acquisitions for the first time in the literature.

The single-stage choice between IPOs and acquisitions has been analyzed in the theoretical model of Bayar and Chemmanur (2011). In their setting, an entrepreneur, with private information about the viability of his firm's business model against product market competitors (and therefore about its future cash flows) makes his firm's exit choice between IPO and acquisition by either selling (a fraction) of his equity in the IPO market or to a potential acquirer. A crucial factor driving the above choice is that, while a stand-alone firm has to fend for itself after going public, an acquirer is able to provide considerable support to the target firm, thus increasing its chances of succeeding and establishing itself in the product market. Two other factors affecting the IPO versus acquisition decision in their setting are the fact that the entrepreneur will be able to retain control of his firm in the event of an IPO (and enjoy the benefits arising from control), whereas he will lose such control in the event his firm is acquired, and the extent of information asymmetry faced by atomistic investors in an IPO, who may be at an informational disadvantage (and therefore less able to assess the true value of the firm) compared to potential acquirers in the same industry. Bayar and Chemmanur

(2011) predict that, in equilibrium, a larger fraction of the more viable firms will go public, while a similar fraction of the less viable firms will be acquired.

Consider now the situation where an entrepreneur making his firm's exit choice in a setting similar to that analyzed by Bayar and Chemmanur (2011) accounts for the possibility of a post-IPO acquisition: i.e., of first going public and being acquired or delisted shortly thereafter. In this case, the entrepreneur's initial trade-off will be affected by the benefits of being acquired or the costs arising from being delisted shortly after the IPO (say, within three years). One important benefit of first going public and then being acquired is that, by successfully going through the due diligence process associated with an IPO, the firm may be able to reduce the asymmetric information faced by potential acquirers, thus enabling it to obtain a higher valuation in a post-IPO acquisition, compared to the valuation it can obtain in a direct acquisition as a private firm. A second important benefit of such a post-IPO acquisition is that the firm may be able to invest the external capital raised in the IPO in its growth opportunities and thus obtain higher valuations in an eventual post-IPO acquisition, compared to the scenario where it is acquired as a private firm, in which case its valuation may be lower due to the inability to fully implement its growth opportunities because of the financial constraints faced as private firm. On the other hand, there may also be several costs associated with a post-IPO acquisition compared to a direct acquisition. The first important cost may arise from the product market: the support a potential acquirer can provide to the firm against product market competition will be reduced if the acquisition is delayed, since the firm will be competing as a stand-alone firm in the interval between its IPO and subsequent acquisition. The second important cost may arise from the financial market: if the firm's IPO is not a significant success, and its post-IPO performance in the financial market is not satisfying (e.g., in terms of post-IPO stock returns or stock market liquidity), this may result in the firm being delisted from the stock market.

In our empirical analysis, we quantify these benefits arising from a potential post-IPO acquisition at a higher valuation over a direct acquisition; and the costs arising from a potential delisting at a lower valuation post-IPO, which, in turn, will allow us to draw implications for a firm's dynamic choice between IPOs and acquisitions. The magnitudes of these potential costs and benefits allow us to determine whether the possibility of being acquired or delisted post-IPO does indeed affect a firm's initial choice between IPOs and acquisitions. Thus, if the benefits arising from being acquired at a higher valuation after the IPO

dominate the expected costs arising from being unable to survive as a publicly traded firm and consequently delisted (and obtaining a much lower valuation subsequently, either in a private sale or in a liquidation), then this will alter the private firm's initial trade-off, pushing it further toward an IPO (over and above its single-period initial exit considerations). On the other hand, if the expected costs arising from a post-IPO delisting are greater than the expected benefits from a potential post-IPO acquisition, then few firms that would have otherwise chosen to be acquired directly (i.e., as a private firm) will be driven to undertake an IPO due to post-IPO considerations. Figure 1 depicts the four possible scenarios faced by a private firm at the point of making its initial exit decision.

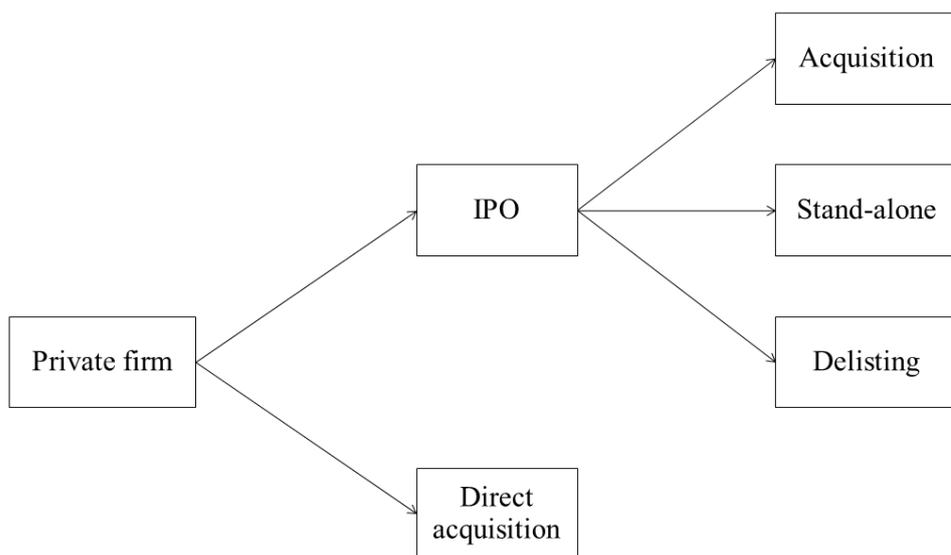


Figure 1: Scenarios faced by a private firm at its initial exit decision

It is not our view that the bulk of firms eventually going through a post-IPO acquisition intentionally go public in order to be subsequently acquired. While some firms going through a post-IPO acquisition might indeed have gone public with a view to being acquired after the IPO, it is possible that most firms that end up being acquired originally hoped to remain as stand-alone firms, but later chose to be acquired either because they got an acquisition offer at a good valuation (which overcame their benefits from remaining as stand-alone firms), or because remaining as stand-alone firms was no longer viable. Similarly, no firm would choose to go public anticipating that they would be delisted soon after, though insiders are likely to be aware at the time of initial exit that delisting is one possible post-IPO scenario. For the arguments we make here regarding the effects of a post-IPO acquisition or a delisting on a firm's original exit decision to go through,

the original intentions of firm insiders are unimportant. All we require is that insiders be aware, at the time of their firm's initial exit decision, that, in addition to remaining a stand-alone firm after the IPO, there are various other post-IPO scenarios, such as being acquired at a higher valuation after the IPO, or being delisted at a valuation discount because their firm is no longer viable as a stand-alone public firm. In this paper, we quantify the costs and benefits accruing to an entrepreneur from each of these alternative scenarios.

Our empirical analysis is structured as follows. Given that the choices we analyze here are in practice sequential, in the first part of our empirical analysis we estimate sequential logit regressions. The sequential logit model consists of estimating logistic regressions for each step or decision for the sample that is relevant for making the decision. This implies an additional logistic regression that estimates the likelihood of a firm choosing among the three post-IPO alternatives: remain stand-alone, be acquired, or be delisted, conditional on the firm having chosen an IPO in the first stage.¹ Thus, a sequential logit model estimates the unconditional sensitivities of the likelihood of IPOs versus acquisitions as a function of firm and market characteristics, and then the likelihoods, conditional on an IPO being chosen, of remaining stand-alone, being acquired, or being delisted (within three years). In the second part of our empirical analysis, we assess the payoffs, in terms of firm valuation, associated with each of the possible exit scenarios, and compute the valuation premium a firm receives by selling in a post-IPO acquisition over a direct acquisition, and the valuation discount a firm incurs by being delisted post-IPO relative to a direct acquisition. We also investigate the determinants of the valuation premium realized by firms acquired after the IPO and of the valuation discount borne by firms delisted after the IPO.

Since most of the existing literature on a firm's exit decision is U.S.-based, focusing on the European context is of interest due to important differences between the institutional settings in the U.S. and Europe, especially given the fact that European Union countries collectively constitute the second largest economy in the world (after the U.S.). For instance, Europe is characterized by the presence of exchange-regulated markets, i.e. loosely regulated markets designed to provide small firms with an easier access to public equity

¹ We use a sequential logit model instead of a simultaneous choice multinomial model because multinomial logit assumes that the random errors for each choice are independent (independence of the irrelevant alternatives assumption, or IIA). This assumption implies that the choice between two alternatives is independent of other choices, while in our setting firms choosing a direct acquisition at the first level do not face any other subsequent choice. Although it allows us to relax the IIA assumption between groups of alternatives, we also rule out using a nested logit model because in our case choices at different levels are observed at different points in time (sequential) instead of being jointly determined (nested).

capital (Vismara, Paleari and Ritter, 2012). The most notable example is London's Alternative Investment Market (AIM), whose remarkable success in attracting new listings has recently raised concerns about the competitiveness of the NYSE (Doidge, Karolyi and Stulz, 2009). Another important difference resides in the ownership structure of firms, with the presence of families and the separation between voting and cash flow rights being more pronounced in the European setting compared to the U.S.² This is the first paper in the literature focusing on the exit decisions of European firms (even in the context of a one-shot exit choice).³

We conduct our empirical analysis by investigating the exit behavior of European firms during the period 1995-2012. We first start by modeling a private firm's choice between being directly acquired as private or going public. Then, among firms that decided to go public, we distinguish those that remained independent, were acquired, or were delisted within three years of the IPO. We obtain data from several databases. Our main sources of information are the Thomson Financial SDC database, that allows us to identify the sample of firms that were directly acquired as private and that of firms acquired after going public, and the EurIPO database, that includes data on the population of European IPOs and their characteristics. We also rely on Amadeus to integrate financial data for European private firms choosing an acquisition as initial exit mechanism, and I/B/E/S to gather analyst coverage information for IPO firms.

The results of our empirical analysis can be summarized as follows. The first stage of our sequential logit model highlights the first important difference between the exit behavior of European and U.S. firms, since we find that firm size does not affect the likelihood of going public. While the evidence that being a large firm increases the probability to conduct an IPO is well established in the U.S. (see, e.g., Chemmanur, He and Nandy, 2010), this is not the case in Europe because of the presence of exchange-regulated markets that facilitate small firm IPOs. Similar to the U.S., the viability of the firm in the product market is important in explaining the likelihood of choosing an IPO over a direct acquisition. We find that firms experiencing a greater rate of sales growth and with a larger market share are more likely to choose an IPO as their initial exit mechanism, arguably because these firms are better able to fend for themselves against product market competition and do not necessarily need the immediate support of an acquirer. Firms operating in industries

² In the U.S., families exercise a significant degree of control over a third of the largest corporations (Villalonga and Amit, 2006), while approximately half of Western European firms are family controlled (Faccio and Lang, 2002). See Adams and Ferreira (2008) for an empirical review of the use of control-enhancing mechanisms across countries.

³ An important exception is Pagano, Panetta, and Zingales (1998), who focus on the going public decisions of private firms in a single European country, namely, Italy, using a sample of 168 Italian firms.

characterized by the presence of a big player are less likely to go public, since they may need the help of a potential acquirer to compete successfully against the big player in the product market. Another important factor influencing a firm's initial exit choice is the extent of private benefits of control accruing to the firm's top management. We find that firms operating in industries characterized by larger private benefits of control (which would be lost in the case of an acquisition) are more likely to choose an IPO.

The results of the second stage of our sequential logit model of an IPO firm's likelihoods of remaining stand-alone, being acquired, or being delisted within three years of the IPO can be summarized as follows. First, firms characterized by higher viability in the product market, as proxied by higher sales growth and larger growth opportunities, are more likely to draw the attention of potential acquirers and therefore become acquisition targets. Second, firms characterized by larger private benefits of control are less likely to be acquired post-IPO, consistent with the notion that entrepreneurs would keep their firms as stand-alone, given the likelihood of the loss of their private benefits after an acquisition. Third, firms characterized by a smaller extent of residual information asymmetry after the IPO, i.e. firms with greater analyst coverage and lower bid-ask spreads, are more likely to be acquired. On the other hand, firms with higher bid-ask spread and worse stock market performance are more likely to be delisted post-IPO. Firms listed on exchange-regulated markets also face a higher likelihood of post-IPO delisting, since their looser listing requirements may result in weaker firms going public. As for the influence of a firm's ownership structure, we find greater separation between ownership and control to be associated with a higher likelihood of post-IPO acquisition, suggesting that pyramidal or cross-held groups may use the IPO as a mechanism to facilitate divestitures. Finally, we find that family firms are more likely to remain stand-alone, given that they may place greater weight on the benefits to the family of remaining in control.

Of course, the expected benefits to a private firm of being acquired post-IPO depend not only on the probability of obtaining such a bid, but also on the valuation premium to the firm upon receiving such a bid. Similarly, the expected costs arising from being delisted not only depend upon the probability of being delisted, but also on the magnitude of the valuation losses arising from such a delisting. We therefore empirically assess these valuation benefits and discounts as well. Our propensity score matching analysis shows that firms that complete a post-IPO acquisition are acquired at a valuation that is significantly higher than the one they could have obtained by choosing a direct acquisition at their initial stage. This valuation

premium comes to around 42.5%. The largest fraction of this premium (25.6%) is realized at the second stage, i.e. from the IPO to the subsequent acquisition, while the valuation premium received in an IPO over a direct acquisition is slightly lower (20.6%). On the other hand, firms that go public and are subsequently delisted incur an average valuation discount of 40.9% relative to a propensity score-matched firm choosing a direct acquisition as its initial exit mechanism. We then go on to analyze the determinants of the valuation premium and discount of post-IPO acquisitions and delisted firms, respectively. Our Heckman selection models indicate that firms that are more viable against product market competition, and those that are characterized by a smaller extent of information asymmetry faced by either the IPO market or potential acquirers, receive higher valuation premia both at the IPO and at the subsequent acquisition. On the other hand, firms affected by a larger extent of information asymmetry incur larger valuation discounts at post-IPO delisting.

Overall, the results of our dynamic empirical analysis suggest that consideration of post-IPO scenarios may affect firms' initial exit decisions considerably. Thus, firm insiders, who, based on their private information about their firm, expect to reap significant benefits due to a post-IPO acquisition bid at higher valuations, will be more inclined to choose an IPO over an acquisition (relative to the case where they make this initial exit decision without accounting for post-IPO considerations). In contrast, private firm insiders who, based on their private information, assess that their firm may face significant expected costs due to a possible delisting will be more inclined toward an acquisition (relative to the situation where they make their initial exit choice without taking these post-IPO considerations into account).

The remainder of this paper is organized as follows. Section 2 relates the paper to the existing literature and delineates its contribution relative to that literature. Section 3 describes the underlying theoretical setting and formulates the hypotheses we test in our empirical analysis. Section 4 describes our data, sample selection procedures, and variables. Section 5 presents our empirical tests and results. Section 6 presents some additional robustness tests. We conclude in Section 7.

2. Relation to the Existing Literature and Contribution

Our paper is related to several strands in the empirical and theoretical literature. The first strand is the empirical literature on IPOs versus acquisitions. Papers in this literature study a private firm's exit

decision as a one-time choice: see, e.g., Brau, Francis, and Kohers (2003); Poulsen and Stegemoller (2008); and Chemmanur, He, He, and Nandy (2012). Some papers in this literature also document that IPOs have a valuation premium over acquisitions, and analyze the source of this valuation premium: see, e.g., Bayar and Chemmanur (2012).

The second strand in the literature our paper is related to is the theoretical literature on a firm's going public (IPO) decision, and on its single-stage choice between IPOs and acquisitions. Apart from the paper by Bayar and Chemmanur (2011) discussed in detail earlier, which specifically analyzes a firm's IPO versus acquisition decision, much of the theoretical literature has focused solely on the going public decision of a firm. Zingales (1995) develops a theoretical model of the benefits to a firm of going public according to which the IPO can help to set a price for a subsequent acquisition. In his model, the IPO acts as a value-enhancing mechanism by increasing the bargaining power of newly listed firms vis-à-vis potential acquirers. Chemmanur and Fulghieri (1999) theoretically analyze the choice of a firm between going public and remaining private in an asymmetrically informed equity market where outsiders can produce information about the firm. They argue that going public reduces information asymmetry since the presence of a publicly observable share price that conveys information across investors reduces the aggregate cost that outsiders need to bear to collect information about the true value of the firm, thus increasing its market value. We use some of this literature to develop some of our testable hypotheses.

The third and final strand is the small literature in strategy, economics, and finance that has studied some specific aspects of firms that go public and are acquired shortly thereafter. For example, Reuer and Shen (2004) and Ragozzino and Reuer (2007) highlight the role of information asymmetry between the firm and its buyers as a crucial determinant of the decision to go public before selling out. Brau, Sutton, and Hatch (2010) document that firms acquired after going public sell at a higher valuation, while Mantecon and Thistle (2011) report a higher return for firms acquired post-IPO compared to private firms filing for an IPO but eventually selling out before going public. Lian and Wang (2012) show that also filing for an IPO, without eventually going public, allows to sell at a premium over a direct acquisition. De and Jindra (2012) document that newly listed firms whose stock performance is better, reflecting their post-IPO success, are more likely to attract acquirers. Unlike the above papers which have focused on studying only some specific aspects of firms that are acquired post-IPO and comparing these with directly acquired firms, our focus here

is on empirically analyzing the entirety of a firm's exit decision and quantifying the costs and benefits associated with alternative exit scenarios, thereby shedding light on how the dynamic nature of this decision affects a firm's initial exit choice between IPOs and acquisitions.

In summary, the contribution made by this paper relative to the above existing literature is two-fold. The first contribution is in offering new insights on a private firm's exit decision, which has been traditionally modeled as a dichotomous, one-time choice between IPOs and acquisitions. By explicitly accounting for the possibility that the firm may be acquired after the IPO or may not be viable as a stand-alone firm, we are the first to take a dynamic perspective and to draw implications on a firm's initial exit trade-off. In particular, we show that while information asymmetry considerations matter, product market considerations also play an important role in a dynamic analysis of the exit decision. We also show that firms that are acquired after the IPO are not necessarily those that fail as stand-alone firms after the IPO: in fact, we document that firms that have more successful IPOs are the ones that are more likely to be subsequently acquired, and that the valuations at which these firms are acquired are higher than those of comparable stand-alone firms.

Our analysis shows that, if an entrepreneur, based on private information about his own firm and potentially with the help of an investment bank advising him, assesses a significant probability that his firm is likely to attract post-IPO takeover bids at substantial premia, an IPO should become more likely compared to the situation where he decides based on the one-shot considerations alone that have been documented in the existing literature. Similarly, if an entrepreneur and the investment bank advising him views delisting subsequent to an IPO at significantly lower valuations as the event with a significantly higher probability, then he is likely to lean more toward a direct acquisition rather than an IPO in his initial exit choice. Our paper makes an important contribution to both the academic and practitioner literature by characterizing the kinds of firms that are likely to face each scenario, and by quantifying the valuation consequences to firms upon the realization of each of these post-IPO scenarios.

The second contribution made by this paper is to present the first European study of the exit decision: all existing studies have made use of U.S. data, even in the context of a one-shot exit decision.⁴ There are, however, significant institutional and cultural differences both relative to the U.S. and across

⁴ An exception is Aslan and Kumar (2013) who make use of U.K. data to test the implications of their theoretical model analyzing how estimation risk affects a private firm's choice between IPOs and takeovers.

European countries that should not be neglected when assessing the economics of the IPO versus acquisition decision. Our empirical analysis confirms indeed that these institutional peculiarities do play a role. Compared to the U.S., we find that the presence of exchange-regulated markets significantly affects a private firm's initial exit trade-off by facilitating the IPO process for small firms. These markets, however, are then associated with a higher post-IPO delisting rate. Within Europe, our analysis suggests that in the U.K., where the financial system has been historically more developed than in the rest of Europe, younger firms are more prone to choose an IPO as initial exit mechanism than in other European countries, such as Germany or France. Given these notable distinctions, and given that the value of entrepreneurial firms based in Europe is quite large compared to those based in the U.S., it is important to have a careful empirical analysis of the exit decisions of private firms making use of European data, especially in the dynamic setting we adopt here. This paper sheds considerable additional light on the optimal dynamic exit strategies to be adopted by European private firms.

3. Theory and hypotheses

In this section, we outline the theoretical framework of the paper and formulate the hypotheses tested in our empirical analysis. We first discuss (in Section 3.1) the trade-offs driving a firm's choice between IPOs and acquisitions assuming the firm ignores the possibility of being acquired or being delisted after the IPO. We then discuss (in Section 3.2) the determinants of the three possible post-IPO scenarios that may face a firm after the IPO, namely, remaining a stand-alone firm, being acquired, or being delisted, based on which we develop testable hypotheses for the second stage of our sequential logit analysis. We then discuss (in Section 3.3) how the post-IPO scenarios affect a firm's initial trade-off between IPOs and acquisitions, based on which we develop testable hypotheses for the first stage of our sequential logit analysis. Finally (in Section 3.4), we discuss the determinants of the valuation premium a firm receives by selling in a post-IPO acquisition, and the valuation discount a firm incurs by being delisted post-IPO.

3.1 Initial trade-off between IPOs and acquisitions

While our objective in this paper is not to test any particular theoretical model, the general theoretical framework we adopt is that of Bayar and Chemmanur (2011). In their setting, an entrepreneur wants to diversify his equity holdings in a firm and exit at least partially. The entrepreneur has two options:

taking the company public (IPO), or selling it to another firm (acquisition). In the first case, he can sell some of his equity holdings in the firm and raise new capital to fund growth opportunities, while continuing to manage the firm after going public. In the case of an acquisition, the entrepreneur will divest his entire equity holdings in the firm, thereby transferring control to an acquirer. Three crucial factors drive this choice: (1) the firm's viability against product market competition; (2) the extent of the private benefits of control accruing to the firm's top management; and (3) the extent of information asymmetry faced by firm outsiders.

First, consider product market competition. The entrepreneur has private information about the viability of his firm's business model against competitors, and about its future cash flows. Therefore, while firms with more viable business models are better able to fend for themselves against product market competition, less viable firms may need the support of an acquirer in order to increase their probability of success in the product market. This implies that firms with more viable business models, as characterized by higher sales growth and greater market share, are more likely to go public rather than be acquired. On the other hand, firms operating in industries characterized by the presence of a big player (a competing firm with a dominant market share in the industry) are less likely to go public, since such firms may need the help of a potential acquirer to compete successfully against the big player in the product market.

Second, entrepreneurs may derive private benefits of control from managing the firm, and these private benefits are likely to be lost in the case of an acquisition. This means that private firms characterized by larger private benefits of control are more likely to choose an IPO rather than an acquisition. Third, atomistic investors in an IPO, mainly relying on publicly available information, may be at an informational disadvantage with respect to firm insiders, while the industry expertise of potential acquirers makes them better able to assess the true value of the firm. This implies that private firms characterized by a greater extent of information asymmetry, as proxied by firm size, are more likely to choose an acquisition over an IPO, since they are more likely to be correctly valued by an acquirer. The age of a firm may also proxy for the extent of information asymmetry faced by outsiders, since younger firms may be characterized by a larger extent of information asymmetry. However, the effect of age on the IPO versus acquisition choice is ambiguous, since younger firms are also likely to be characterized by larger growth options.

3.2 Determinants of post-IPO scenarios

We now discuss the determinants of the three possible post-IPO scenarios. If a stand-alone firm receives an acquisition bid greater than the sum of its current market value plus any private benefits of control accruing to top management, then it is likely to be acquired, since current firm management is likely to agree to the acquisition in that case. If, on the other hand, a firm is unable to meet the conditions imposed by the exchange to remain listed, or its top management believes that the benefits of remaining listed are outweighed by the costs of continuing to be listed, then it is likely to be delisted. Finally, if a firm is neither acquired nor delisted, it will remain a stand-alone firm.

We now analyze the determinants of a firm receiving a high enough acquisition bid to be acquired post-IPO. We expect the level of product market viability and the extent of the private benefits of control accruing to the firm's top management not to be significantly affected by the IPO decision. Within the group of firms that are viable enough in the product market to go public, firms characterized by higher viability may either be acquired post-IPO or to remain a stand-alone firm. On the one hand, an acquirer is more likely to make a bid for a stand-alone firm if the former views the latter as being more successful in the product market (since any synergies from acquiring it are greater); on the other hand, a successful stand-alone firm is more likely to be able to fend for itself against product market competition. Therefore, firms that are more viable in the product market, as proxied by higher sales growth and larger growth opportunities, may either be more likely to receive an acquisition bid or to grow as stand-alone firms: i.e., it is difficult to predict which scenario is more likely to occur for such firms based on *ex ante* considerations. The market share of a firm in the product market is also likely to play an ambiguous role in determining whether or not it receives a post-IPO acquisition bid. On the one hand, acquirers may view firms with greater market share as more attractive targets, since their synergistic value to acquirers may be greater; on the other hand, target firms themselves may be more likely to agree to be acquired if their market share is smaller, since, in this case, they may place greater value on potential help from acquirers in product market competition. In summary, we are agnostic about the expected signs of a firm's product market viability proxies on the likelihood of being acquired post-IPO. As for the role played by private benefits of control, consistent with the prediction formulated in the previous subsection about the initial exit decision, the likelihood of a post-IPO acquisition will also be smaller if these private benefits are larger (since, *ceteris paribus*, a potential acquirer has to

make a larger bid to compensate the CEO for the loss of these larger private benefits of control, thereby inducing him to agree to the acquisition).

What is crucially affected by the decision to go public is the extent of information asymmetry faced by firm outsiders, as an IPO provides several channels through which it can be reduced. Information production and disclosure requirements associated with the listing process, such as the roadshow and the release of an official IPO prospectus, increase firm transparency and decrease the residual information asymmetry faced by outsiders once the firm has gone public. This allows the firm to enter the feasible set of a larger number of potential buyers thanks to the lower search costs. Therefore, firms able to reduce information asymmetry to a larger extent by going public are more likely to be acquired post-IPO. This implies that, if the target firm is affiliated with a more reputable underwriter, receives greater analyst coverage post-IPO, and exhibits a lower bid-ask spread, then potential buyers will face a lower extent of information asymmetry when evaluating these firms. Consequently, such firms are more likely to receive higher post-IPO bids, and therefore more likely to be acquired after the IPO. Further, firms that are viewed by potential acquirers as being undervalued at IPO relative to their intrinsic value (as measured by the Rhodes-Kropf, Robinson, and Viswanathan (2005) misvaluation measure), are also more likely to be subsequently acquired.

We also expect a firm's ownership structure to drive its likelihood of post-IPO acquisition. Families typically have longer investment horizons than other types of shareholders (Anderson and Reeb, 2003), which may lead to reluctance to give up control in an acquisition shortly after becoming a public company. Furthermore, family firms tend to be associated with a higher degree of information asymmetry by outside investors due to severe agency problems between controlling and non-controlling shareholders, with family members attaching socioemotional wealth to the control of the firm (e.g., associated with the recognition of family identity in the firm, the ability to exercise family authority, and the perpetuation of the family dynasty). This generates the preference to preserve control even when this increases business risk (Gómez-Mejía et al., 2007). We therefore expect family firms to face a lower likelihood of being acquired post-IPO.

We now analyze the determinants of a firm being delisted post-IPO. As we discussed earlier, a firm is likely to be delisted if it either cannot meet the requirements of the exchange to remain listed, or if top management does not assess the benefits of continuing to be listed to be greater than the costs. Firms

performing more poorly in the product market (as measured by sales growth or market share) are more likely to go bankrupt and therefore be delisted. Firms facing greater information asymmetry in the equity market, such as smaller firms (proxied by sales), are likely to have smaller trading volume, leading to a greater likelihood of being delisted. Further, since firms conducting less successful IPOs are likely to face a greater extent of residual information asymmetry (post-IPO) in the equity market, firms with higher bid-ask spreads are also more likely to be delisted. Furthermore, firms with poorer performance in the financial market, as measured by their excess stock returns, are also likely to attract smaller trading volume, resulting in a greater likelihood of being delisted. Finally, firms with smaller growth opportunities, as measured by the decomposition of their market to book ratio following the Rhodes-Kropf, Robinson, and Viswanathan (2005) growth opportunity measure, are also more likely to be delisted.

3.3 Implications of post-IPO scenarios on the IPO versus acquisition decision

We now discuss how the determinants of the three post-IPO scenarios discussed in Section 3.2 affect a private firm's initial choice between IPOs and acquisitions. First, consider product market performance. We argued in Section 3.1 that firms with more viable business models, as captured by higher sales growth or market share, are more likely to go public. In addition, as we discussed in Section 3.2, such firms are also less likely to be delisted after the IPO. This means that considerations of post-IPO scenarios by private firms at their initial exit stage are even more likely to make firms with more viable business models to choose an IPO over an acquisition compared to the case where the exit choice were made based on their initial trade-offs alone.

Second, consider the magnitude of the private benefits of control accruing to the top management of a private firm at the time of initial exit. We argued in Section 3.1 that firms characterized by larger private benefits of control are more likely to choose an IPO over an acquisition. However, as we discussed in Section 3.2, such firms are also less likely to agree to be acquired after the IPO. This means that considerations of post-IPO scenarios are likely to make firms characterized by larger private benefits of control choose an IPO over an acquisition with a *lower* likelihood than if the exit choice were made based on their initial trade-offs alone.

Third, consider the extent of information asymmetry faced by private firms at the time of initial exit. We argued in Section 3.1 that firms characterized by a smaller extent of information asymmetry (as proxied

by firm size) are more likely to go public. In addition, as we discussed in Section 3.2, such firms are also more likely to be acquired after the IPO and less likely to be delisted. This implies that considerations of post-IPO scenarios are likely to make private firms facing a smaller extent of information asymmetry choose an IPO over an acquisition with an even greater likelihood than if the exit choice were made based on their initial trade-offs alone.

3.4 Determinants of the valuation premium

We now discuss the determinants of the valuation premium a firm may receive in a post-IPO acquisition or the valuation discount it may receive at the point of delisting. We first discuss the determinants of the valuation premium in post-IPO acquisitions. The valuation premium a firm receives in a post-IPO acquisition over a direct acquisition can be thought of conceptually as consisting of two parts. The first part is the valuation premium a firm may receive in an IPO over an acquisition, and the second part is the valuation premium a firm may receive in the post-IPO acquisition over the IPO valuation. We discuss below how each of the variables we discussed above affect each of these two parts of the valuation premium, and therefore the overall valuation premium of a post-IPO acquisition over a direct acquisition.

First consider product market characteristics, such as the firm's viability in the product market, as measured by sales growth and market share. As we discussed in Section 3.1, firms that are more viable against product market competition are more likely to go public rather than be acquired, given that they are more likely to be successful: i.e., firms above a certain threshold in product market viability will go public, obtaining higher valuations in the IPO market compared to the valuation of firms that are directly acquired. By the same reasoning, within the firms that exceed the threshold of product market viability for going public, firms that are likely to be stronger against product market competition are likely to obtain higher valuations. This implies that firms with more viable business models, as characterized by higher sales growth and greater market share, are likely to obtain higher valuation premia over a direct acquisition.

We turn now to the valuation premium of a post-IPO acquisition over the firm's IPO valuation. First, as we discussed in Section 3.2, a firm is likely to receive a post-IPO acquisition bid high enough to agree to the acquisition if it is viewed by potential acquirers as being synergistic with their own future product market activities and as being successful in the product market in their own industry. Further, the higher the value of the variables that measure the above attributes, the higher the post-IPO acquisition bids such firms are likely

to receive. This implies that firms characterized by greater viability in the product market, as measured by sales growth and market share, are likely to receive higher valuation premia over their IPO valuations. Since the valuation premium of a post-IPO acquisition over a direct acquisition is the sum of the valuation premium of an IPO over a direct acquisition, and a post-IPO acquisition over IPO valuation, this valuation premium is also expected to be increasing in the sales growth and product market share of the firm.

Second, a variable that may affect the post-IPO acquisition valuation of a firm but not its IPO valuation is the magnitude of private benefits of control accruing to firm management. As we discussed in Section 3.2, the target firm top management is likely to require a higher bid from an acquirer (for a given intrinsic firm value) to agree to an acquisition if their private benefits from remaining in control are larger. This may provide target firm top management greater bargaining power and thus the ability to extract a large fraction of the gains generated from the acquisition, resulting in a higher valuation premium for such firms in a post-IPO acquisition over their IPO valuation. This will also imply a higher valuation premium of a post-IPO acquisition over a direct acquisition, since it is the sum of the valuation premium obtained by the firm in an IPO over a direct acquisition, and a post-IPO acquisition premium over its IPO valuation.

Third, we turn to the effect of the information asymmetry associated with a firm on valuation premium. As discussed in Section 3.1, firms facing a smaller extent of information asymmetry are more likely to go public rather than to be directly acquired, since atomistic investors in the IPO market are less able than potential acquirers to correctly value the firm. By the same reasoning, within the set of firms meeting the information asymmetry threshold for going public, those characterized by a smaller extent of information asymmetry will receive higher IPO valuations, and therefore a larger IPO valuation premium over a direct acquisition. This implies that variables that measure information asymmetry, such as IPO underwriter reputation (higher the underwriter reputation, smaller the information asymmetry), are likely to be associated with a higher IPO valuation premium. Further, as discussed in Section 3.2, acquirers are more likely to make a post-IPO bid for firms that have gone public if it is easier for them to value potential target firms, so that firms able to reduce information asymmetry to a greater extent by going public are more likely to receive such bids. In addition, since acquirers face a smaller extent of valuation uncertainty if the information asymmetry they face is smaller, they are likely to offer higher bids for firms for which they face a smaller extent of information asymmetry. This implies that firms characterized by higher reputation of the

IPO underwriter, smaller bid-ask spread, and greater analyst coverage are likely to receive higher post-IPO acquisition premia over their IPO valuation. Finally, since the valuation premium of a post-IPO acquisition over a direct acquisition is the sum of the valuation premium obtained by the firm in an IPO over a direct acquisition, and a post-IPO acquisition premium over its IPO valuation, this valuation premium is also expected to increase with information asymmetry variables, namely higher underwriter reputation, smaller bid-ask spread, and greater analyst coverage.

Fourth, a variable that may affect the post-IPO acquisition valuation of a firm is its family status. As we discussed in Section 3.2, family owners of a potential target firm are likely to require a higher bid from an acquirer (for a given intrinsic firm value) to agree to an acquisition because, different from non-family owners, they tend to attach a socioemotional wealth endowment to the control of the firm. Family owners are therefore likely to require an additional compensation for giving up such noneconomic benefits (that do not coincide with the private benefits of control discussed above, whose hypothesized effect does not depend on the family status). This may result in a higher valuation premium for family firms in a post-IPO acquisition over their IPO valuation. Again, this will also imply a higher valuation premium of a post-IPO acquisition over a direct acquisition.

We now turn to the valuation discount of a post-IPO delisting over the firm's IPO valuation. As we discussed in Section 3.2, firms performing more poorly in the product market, facing greater information asymmetry in the equity market, and conducting less successful IPOs are more likely to be delisted. By the same reasoning, within this set of firms, those characterized by a lower level of product market viability (as proxied by sales growth and market share) and higher information asymmetry (as proxied by underwriter reputation and bid-ask spread) are likely to receive lower valuations. This implies that these firms will incur larger discounts relative to their previous IPO valuations. Finally, the overall valuation discount of a delisted firm over a direct acquisition is the sum of the valuation premium of a firm's IPO valuation over its valuation in a direct acquisition, and the valuation discount of a post-IPO delisting over its IPO valuation (with the proper algebraic signs assigned to each of these two variables). Consequently, the magnitude of the above overall valuation discount is also expected to be larger in the presence of lower product market viability and higher information asymmetry, since the magnitude of a firm's valuation discount upon delisting relative to its IPO valuation can be expected to be increasing in the above variables.

4. Data, sample and variables

4.1 Data and sample selection

The data used in this study are drawn from several databases. We cover the population of European IPOs is from the EurIPO database, providing offer- and firm-level data for each firm going public in the stock exchanges of Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom.⁵ To keep track of the first three years of life as a listed firm, we start from the population of 4,021 firms going public from 1995 to 2009, and obtain a final sample of 3,704 IPOs for which we have complete data. We integrate analyst coverage data from I/B/E/S and Investext, and ownership data from official IPO prospectuses and Orbis. The sample of direct acquisitions of private firms is obtained from the Thomson Financial SDC Mergers and Acquisition database. We require that the firm is based in Europe, targeted in an M&A during the same time window of our IPO sample, and that the deal valuation is available. Since a fraction of private firms lack of adequate financial data in Thomson SDC, we integrate this information from Amadeus and obtain a direct acquisitions sample of 5,733 observations. In total, our sample is made of 9,437 firms based in 18 European countries.

We then identify within the sample of 3,704 IPO firms those that are acquired (post-IPO acquisitions), are still operating as independent firms (stand-alone), and are delisted from the stock market (delisted) at the three-year IPO anniversary. First, we obtain a sample of 648 post-IPO acquisitions, i.e. firms going public and being acquired within three years during 1995-2012, by matching EurIPO data with M&A deals data available in Thomson SDC. We consider the firm's first M&A deal completed as target not later than three years since the IPO date. Second, we define the stand-alone sample of 2,904 firms that are operating as independent firms at their three-year IPO anniversary, without having completed any M&A deal as target over the previous three years. Third, the delisted sample is composed of 152 firms being delisted (for reasons other than acquisition) within three years of the IPO, based on information from EurIPO and

⁵ We consider the French Paris Bourse until the creation of Euronext through the merger of the stock exchanges of Belgium, France, the Netherlands and Portugal, where the first listing took place on January 27, 2005. Afterwards, we consider Euronext in its entirety. Austria, Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Norway, Spain, Sweden, and Switzerland stock exchanges are covered from 2006 onwards.

Datastream.⁶ Table 1 presents the composition of our European sample. As reported in Panel A, approximately half of our sample is composed of firms based in the U.K., which may raise the concern that our evidence is driven by this country. We will address this issue by providing evidence at a single country-level. Panel B reports the year distribution of the sample. Post-IPO scenarios refer to the firm's status at the three-year IPO anniversary. Of the 3,704 firms going public during our sample period, 648 (17.5%) are acquired and 152 (4.1%) are delisted from the stock market, while the largest fraction (78.4%) is operating as independent firms three years after the IPO.

4.2 Variables

In this section, we discuss the construction and measurement of the various firm-specific and industry-specific test variables and control variables employed in our analyses. Our test variables are measured at the last fiscal year before a private firm's exit choice between IPO and acquisition. They can be categorized as product market, private benefits, and information asymmetry variables.⁷ Concerning product market variables, we define two proxies of firm viability against product market competition: the average annual sales growth rate up to three years prior to the initial exit decision, and the firm's market share in terms of sales in its industry (three-digit SIC level).⁸ We then determine whether there is a dominant player in a firm's industry by defining a big player dummy variable, equal to 1 if there is a firm with a market share larger than 30% in the same three-digit SIC industry.⁹ Private benefits of control are proxied by the same industry wide dummy variable used by Bayar and Chemmanur (2012), inspired by Rajan and Wulf (2006) who empirically analyze perk consumption by firm executives. This private benefits dummy equals 1 for

⁶ Delisted firms include both firms who fail to meet listing requirements whose stocks are forcedly removed by the stock exchange (imposed delistings), and firms who delist their shares upon their own request (voluntary delistings). While imposed delistings are by definition a negative outcome for the firm, voluntary delistings may not be considered as such. In Europe, however, voluntary delistings occur more rarely than in the U.S. because they require the completion of a tender offer aimed at protecting minority shareholders. As a result, they account for a small fraction of all delistings (roughly 14%, according to Vismara, Paleari and Ritter, 2012). This allows us to consider delisting as a negative outcome. The empirical evidence that delisted firms in our sample exhibit the worst stock performance (Table 2, Panel B) supports this view.

⁷ Product market and private benefits variables are available in both the steps of the analysis of a firm's exit decision (IPO vs. acquisition decision and post-IPO scenarios), while IPO-related information asymmetry variables are available only for the second step (post-IPO scenarios), i.e. for firms that choose the IPO as initial exit mechanism.

⁸ Sales growth is computed as the average annual change in sales over the three years or two years before the IPO/acquisition, depending on data availability. For 837 IPO firms and 1,872 direct acquisition firms, there are no available financial data prior to the firm's exit decision.

⁹ As a robustness check, we set the threshold to 25% and 35% with results remaining qualitatively unchanged.

firms operating in oil & gas production (SIC code 13), chemicals and allied products (SIC code 28), petroleum refining (SIC code 29), and transportation equipment (SIC code 37) industries.¹⁰

We then define a set of proxies for a firm's extent of information asymmetry. First, we use firm size, measured by the logarithm of last fiscal year sales, and age, which may also capture the amount of growth options faced by the firm, measured as the logarithm of 1 plus age in years at the exit decision. We then focus on the extent to which firms reduce information asymmetry by going public, by defining three additional proxies for firms that choose the IPO as initial exit mechanism: (1) underwriter reputation, defined as a dummy equal to 1 if the IPO is led by a top-tier underwriter, i.e. having an updated Carter-Manaster rank of 8 or above; (2) analyst coverage, defined as the number of analysts covering the firm at the IPO; (3) bid-ask spread, defined as the average ratio of daily bid-ask spread divided by the midpoint of bid and ask prices, from 1 month after the IPO to the minimum between 13 months after the IPO and 2 months before acquisition or delisting. Firms affiliated with more reputable underwriters, receiving greater analyst coverage, and with a lower bid-ask spread are expected to face a smaller extent of residual information asymmetry. We also measure the firm's performance in the financial market by computing its excess return, defined as the firm's buy-and-hold stock return over 3 years since IPO if it remains stand-alone, or up to 2 months before acquisition or delisting, minus the FTSE Euromid index buy-and-hold return over the same period. Finally, we decompose the market-to-book ratio of the firm implied by its IPO price into the growth opportunities and misvaluation components, following Rhodes-Kropf, Robinson, and Viswanathan (2005). These are defined as the logarithm of the ratio between the firm's intrinsic value and book value, and the firm's market value and intrinsic value, respectively.¹¹

To account for the effect that the presence of European second-tier markets may exert on a firm's exit decision, we insert the exchange-regulated market dummy, equal to 1 if the firm goes public on one of these markets¹². We then include two variables aimed at capturing the effect of a firm's ownership structure

¹⁰ According to Rajan and Wulf (2006), these industries are the top five in CEO perk consumption and have a CEO-Divisional Manager differential in the perk consumption score greater than 1. The CEO-Divisional Manager differential in perk consumption measures the extent to which a CEO values his or her perks as a unique privilege.

¹¹ We compute a firm's intrinsic value as in Fu, Lin, and Officer (2013, Appendix A) as a linear function of a firm's book value of equity, net income (i.e., the growth of book value of equity), and leverage.

¹² Exchange-regulated markets are: Alternative Investment Market (United Kingdom), Hors-Cote, Marché Libre and Alternext (Belgium, France, the Netherlands, and Portugal), Freiverkehr Markt (Germany), MAC and AIM Italia (Italy), First North (Sweden, Denmark, Latvia, and Lithuania), Geregelter Freiverkehr (Austria), and Oslo Axess (Norway).

on its exit outcomes by reconstructing the ownership and control chain of each firm going public according to information reported in official prospectuses. We employ the following two variables: a family dummy, defined as in Faccio and Lang (2002), equal to 1 if the ultimate owner is a family (including an individual) or a firm that is unlisted on any stock exchange using a 20% voting rights threshold; and the V/C ratio, computed as the ultimate owner's voting rights divided by cash flow rights, that captures the degree of separation between ownership and control of the firm. Values of V/C ratio greater than one imply deviations from the one share-one vote rule through mechanisms such as dual class shares, pyramiding, and cross-holdings.

Finally, we construct our set of control variables as follows. We control for the presence of venture capitalists (VCs) among the firm's pre-IPO shareholders by employing a dummy for VC backed IPOs. Since VCs' exit incentives may be different from those of other pre-IPO shareholders, we further discuss the presence of VCs in Section 6. We then include firm leverage, defined as the ratio of total debt to total assets, and market momentum, defined as the FTSE Euromid index return over the 100 days prior to the exit decision.

5. Empirical tests and results

In this section, we present our empirical tests and the results of our univariate and multivariate analyses. We first analyze the determinants of a private firm's initial exit decision between IPO and acquisition, and the likelihood of each post-IPO outcome conditioned on the firm having conducted an IPO. Then, we assess the valuation obtained by firms going through each of the possible exit scenarios, and quantify the benefits and costs associated with each exit route by computing the valuation premium (or valuation discount) with respect to different benchmarks. Finally, we analyze the determinants of this valuation premium.

5.1 Determinants of a firm's exit decision

In this section, we present our results of our empirical analysis of the determinants of a firm's exit decision. We first present the results of our univariate tests. Then, we develop a sequential logit analysis of the determinants of firms going through each of the possible exit routes.

5.1.1 Univariate analysis

Table 2 describes the characteristics of the firms that go through each of the possible exit routes. Panel A compares the characteristics of firms choosing a direct acquisition as initial exit mechanism with those of firms choosing an IPO, while Panel B compares the characteristics of firms that, after conducting an IPO, go through each of the three possible post-IPO outcomes, i.e. being acquired (post-IPO acquisition), remaining independent (stand-alone), and being delisted from the stock market (delisted) within three years of the IPO.

Panel A shows that private firms that initially choose an IPO instead of a direct acquisition are characterized by a higher sales growth rate (97.4% vs. 49.9%, on average) and larger market share in their industry (1.5% vs. 0.4%). The difference between the two groups is statistically significant, in line with the prediction that more viable firms tend to prefer the IPO as initial exit mechanism. This is consistent with the evidence from Bayar and Chemmanur (2012) and Poulsen and Stegemoller (2008), who find that firms characterized by higher growth rate are more likely to go public. The presence of a big player in the firm's industry is more common among firms that choose a direct acquisition (15.9% vs. 13.9%), while the fraction of firms operating in industries characterized by larger private benefits of control is significantly higher among firms that choose to go public (13.1% vs. 4.7%). This suggests that the presence of a big player may increase the likelihood of choosing a direct acquisition over an IPO, while the opposite effect is associated with the presence of private benefits of control. Firms that choose an IPO are on average larger than those opting for a direct acquisition (272.1 vs. 61.8 €m in sales, on average), suggesting an increased preference for IPOs by firms affected by a smaller extent of information asymmetry, and are therefore easier to value. However, IPO firms are younger than direct acquisitions (15.6 vs. 17.1 years), and are characterized by higher leverage ratios (28.7% vs. 24.4%). Predictably, IPOs tend to be conducted when financial market conditions are favorable, as they are associated with a better market momentum than direct acquisitions (5.1% vs. 2.9% prior market return), on average.

We now turn to the comparison of firms that, after choosing an IPO as initial exit mechanism, go through each of the three possible post-IPO scenarios, namely, post-IPO acquisition, remain stand-alone, and post-IPO delisting. Panel B reports that firms that are acquired after the IPO are characterized by the highest average sales growth rates (137.1%), followed by delisted (114.1%) and stand-alone (92.2%) firms, suggesting that higher growth rates may increase the firms' attractiveness as potential targets. Stand-alone

firms are the largest in terms of market share (1.7%), suggesting that the larger the market share of a firm, the lower its likelihood of either being acquired or delisted. Firms operating in industries where there is a dominant player show the highest propensity to be acquired (17.1%), while delisted firms show the lowest (7.5%), and stand-alone firms are in between (13.5%). The presence of a big incumbent in the same industry seems therefore to increase the likelihood of a post-IPO acquisition. On the other hand, the fraction of firms that are acquired post-IPO and operate in industries characterized by greater private benefits of control is smaller (11.2%) compared to stand-alone and delisted firms (13.1% and 21.5%, respectively). This is consistent with the idea that firm management is less likely to accept an acquisition bid in presence of larger private benefits of control.

Concerning information asymmetry-related variables, stand-alone firms are the largest and oldest firms (310.3 €m sales and 16 years, on average), while firms that are delisted after the IPO are the smallest and youngest (96.9 €m and 8.6 years). Our financial market proxies for information asymmetry suggest that post-IPO acquisitions are associated with the lowest extent of information asymmetry, while delisted firms are associated with the highest, with stand-alone firms being in between. On average, post-IPO acquisitions exhibit the highest levels of underwriter reputation (17% top-tier underwriters) and analyst coverage (2.0 analysts), and the lowest level of bid-ask spread (4.3%). This is consistent with the idea that firms that are acquired post-IPO are those that are able to reduce information asymmetry to a greater extent by means of their success in the IPO market. On the other hand, the lowest underwriter reputation (10.4%) and analyst coverage (1.2 analysts), and the highest bid-ask spread (10.5%) are associated with delisted firms. The average excess return of post-IPO acquisitions (-9.5%) is between that of stand-alone (-7.8%) and delisted firms (-47.8%). This suggests that, while a lower extent of information asymmetry attracts acquisition bids, firms exhibiting high stock returns may become too costly for potential acquirers.

The majority of firms that are delisted within three years of the IPO (63.8%) have gone public on an exchange-regulated market, in line with previous European evidence documenting that these markets are associated with higher delisting rates (Vismara, Paleari and Ritter, 2012). Family firms account for exactly half of firms that remain stand-alone after conducting an IPO, while their presence is lower among those that are either acquired or delisted post-IPO (43.8% and 42.5%, respectively). A similar level of separation

between ownership and control is observed among delisted (116.8%) and acquired (117.5%) IPO firms, while the average value of this variable is lower among stand-alone firms (114%).

5.1.2 *Multivariate analysis: sequential logit regressions*

We now analyze the determinants of a firm's exit decision hold in a multivariate setting using sequential logit regressions. Table 3 reports the estimates of our sequential logit model. The first step models a private firm's likelihood of choosing an IPO over a direct acquisition, and the second step models the likelihood of a firm going through each of the three post-IPO scenarios, i.e. being acquired, remaining stand-alone (base outcome), and being delisted post-IPO, conditioned on the firm having chosen an IPO at the first step. Panel A reports estimates from the full sample and the subsample with available sales growth. Panel B splits the sample between main and exchange-regulated market IPOs.¹³ Panel C reports country-level evidence from the three countries with the largest number of observations, namely United Kingdom, France, and Germany.

We first discuss the results in Panel A. In the first step (Models 1 and 4), the coefficients of our two proxies for a firm's viability in the product market, i.e. sales growth and market share, are positive and significant, consistent with our prediction that firms with more viable business models are better able to fend for themselves against product market competition, and are therefore more likely to choose an IPO over a direct acquisition as their initial exit mechanism. On the other hand, less viable firms are more likely to need the support of an acquirer in order to increase their survival chances in the product market, and are therefore more likely to choose a direct acquisition. The coefficient of the big player dummy is negative and significant, which documents that firms operating in industries characterized by a dominant player are less likely to choose an IPO relative to an acquisition. This is in line with our idea that the presence of a dominant firm in the same industry increases the likelihood of an acquisition, in order to benefit from the acquirer's support in competing against the big player. The private benefits dummy reports a positive and significant coefficient, which documents that firms operating in industries characterized by larger private benefits of control are more likely to choose an IPO relative to an acquisition. This finding supports our hypothesis that

¹³ In this analysis, we restrict the sample to firms that actually face a choice between going public on a main and exchange-regulated market. In particular, when modeling the likelihood of an IPO vs. direct acquisition, we assume that large companies would not consider exchange-regulated markets as a listing option. In line with Vismara, Paleari, and Ritter (2012), therefore, we exclude firms exceeding €50m in sales, reducing the sample of direct acquisitions from 5,733 to 4,249 firms.

entrepreneurs or managers who derive larger private benefits of control from managing their firm are less likely to give up these benefits by accepting an acquisition bid.

Turning now to the effects of information asymmetry, we find that the coefficient of the sales variable is not significant (or weakly significant), which is in contrast with a well-established finding from the U.S. literature documenting that larger firms are more likely to go public (see, e.g., Chemmanur, He and Nandy, 2010). This difference might be explained by the presence of exchange-regulated markets in Europe, that provide small firms with an easier access the public equity market. We further clarify this issue in the discussion of the evidence in Panel B. On the other hand, the age coefficient is negative and significant, documenting that younger firms are less likely to choose an IPO as initial exit mechanism. This is in line with our argument that firms affected by a larger extent of information asymmetry prefer a direct acquisition since acquirers with industry expertise are better able to assess their correct valuation. Further, younger firms may embed greater growth options than older, more mature firms. The coefficients of our control variables reveal that leverage and market momentum are positively associated with a private firm's likelihood of conducting an IPO. Overall, the evidence from the first step estimation of our sequential logit model is broadly consistent with the predictions formulated in Section 3.1 about a private firm's initial trade-offs between IPO and acquisition.

We now turn to the evidence of the second step estimation, by first discussing the likelihood of being acquired post-IPO over remaining stand-alone (Models 2 and 5), which is the base outcome. The coefficient of the sales growth variable is positive and significant, revealing that IPO firms experiencing greater sales growth rates are more likely to be acquired rather than to remain stand-alone. This suggests that acquirers are more willing to propose a favorable bid to IPO firms that are more successful in the product market. Market share has a negative effect on the likelihood of being acquired post-IPO, suggesting that target firms with smaller market shares may place greater value on the potential help from acquirers in product market competition (although this result becomes weaker in the presence of the sales growth variable). Firm age also has a negative effect, since older, more established firms are less likely to be acquired shortly after going public.

The extent of a firm's residual information asymmetry after the IPO is crucial in determining the likelihood of its subsequent outcome, as suggested by the coefficients of our IPO-related proxies. Greater

analyst coverage and lower bid-ask spreads significantly increase newly listed firms' likelihood of being acquired post-IPO over remaining stand-alone. These factors contribute to reduce the extent of information asymmetry faced by potential acquirers in assessing the quality of the target firm. The coefficient of the growth opportunities component of a firm's market to book ratio is also positive and significant, suggesting that firms embedding larger growth opportunities are more attractive to potential acquirers. On the other hand, the coefficient of the misvaluation variable is negative and significant, since less overvalued firms are cheaper, and therefore more attractive, targets.

The coefficient of the exchange-regulated market dummy is not significant, showing that the post-IPO acquisition rate does not differ from that of main markets. The coefficient of the family dummy is instead negative, in line with the argument that family firms might be associated with a higher degree of information asymmetry, and that family owners are more reluctant to accept an acquisition bid than non-family owners. This evidence is consistent with other European studies linking corporate ownership and M&As (e.g., Caprio, Croci and Del Giudice, 2011), but not with some U.S. studies, such as Basu, Dimitrova, and Paeglis (2009) who document that in the U.S. the largest fraction of IPO firms targeted in M&As is family controlled. Surprisingly, firms characterized by greater separation between ownership and control, as proxied by the V/C ratio, are significantly more likely to be acquired soon after the IPO. This may suggest that pyramidal or cross-held groups use the IPO as an intermediate stage to sell a firm. Finally, the coefficient of the VC backing dummy is negative and significant, showing that VC backed firms are less likely to be acquired post-IPO.

Concerning a firm's likelihood of being delisted after the IPO over remaining stand-alone (models 3 and 6), we find that underwriter reputation, analyst coverage, and bid-ask spread variables report significant coefficients with the expected sign. This supports our prediction that firms affected by a larger extent of residual information asymmetry after the IPO are less able to attract sufficient trading volumes and are therefore more likely to be delisted. The coefficient of the excess return variable is also negative and significant, documenting that firms with worse stock performance in the aftermarket are more likely to be delisted, and the same evidence is found for the firms' amount of growth opportunities. Exchange-regulated markets are associated with a significantly higher likelihood of delisting, since the possibility to conduct an IPO at lower costs and with looser listing requirements may result in lower quality firms with scarce survival

prospects to go public. On the other hand, family firms are significantly less likely to be delisted shortly after the IPO. Overall, the evidence from the second step estimation is broadly consistent with the predictions formulated in Section 3.2 about the determinants of a firm's likelihood of going through each of the three post-IPO scenarios.

We now turn to the discussion of the results of Panel B where the estimation is done separately for main and exchange-regulated market IPOs. Such a distinction represents a crucial difference between the European and the U.S. stock markets, and may have important implications on a firm's exit trade-off. The most interesting result is associated with the effect of firm size on the initial exit choice between IPO and direct acquisition. As previously revealed by the evidence in Panel A, size (as proxied by sales) is not a significant determinant of a firm's likelihood of going public, different from the U.S.. However, results in Panel B document that firm size is still an important driver of the decision to go public on a main market (Model 7), while it does not affect the likelihood of conducting an exchange-regulated market IPO (Model 10). This documents that, as compared to the U.S, the presence of less stringent exchange-regulated markets arms small European companies with higher possibility to choose between an IPO or an M&A. Another important difference between main and exchange-regulated markets is associated with the effect of a firm's market share on its likelihood of being acquired post-IPO (Models 8 and 11). The full sample estimation of Panel A showed that firms with greater market share are less likely to be acquired post-IPO, and evidence in Panel B reveals that this effect is driven by main markets. This is in line with our assumption that large, established firms do not consider exchange-regulated markets as a listing option, thereby limiting the cross-sectional variation of market share in these markets. As for the likelihood of being delisted (Models 9 and 12), we find that the predictive power of some of the determinants is stronger among exchange-regulated market IPOs, such as the firm's excess stock return, the amount of growth opportunities, and the family status.

Finally, we turn to the discussion of the results of Panel C where the estimation is done separately for the three most important countries of our sample (in terms of number of observations), namely U.K., France, and Germany. Institutional features vary significantly across European countries and this may reflect in differences in the exit trade-off based on the firm's country of operation. Concerning the initial choice between IPO and direct acquisition (Models 13, 16, 19), we find that the effect of firm age on the likelihood

of going public is heterogeneous. Its coefficient is negative and significant among U.K. firms, insignificant among French firms, and positive and significant among German firms. Such a varying pattern might be explained by historical differences in the financial systems, with equity markets being less developed in civil law countries of Continental Europe than in the British common law system (La Porta et al., 1997). As a result, younger firms exhibit an increased propensity to go public over be acquired in the U.K., while the opposite pattern is found in Germany. The role of firm age varies across countries also in determining the likelihood of being acquired post-IPO (Models 14, 17, 20). The full sample estimation of Panel A showed that older firms are less likely to undergo a post-IPO acquisition, but this effect is confirmed only among German firms and, with weaker statistical significance, among French firms. In the U.K., where the market for corporate control tends to be more active, older firms have on average the same degree of exposure to post-IPO takeovers as younger firms.

In summary, the results of our sequential logit analysis shows that firms with more viable business models in the product market, characterized by larger private benefits of control, and facing a lower extent of information asymmetry are more likely to choose an IPO over an acquisition as an initial exit mechanism. Then, firms that are more viable in the product market and have reduced the information asymmetry faced by them in the equity market to a greater extent (partly as a result of the IPO process) are also more likely to become acquisition targets after having conducted an IPO. This means that, if such firms were able to take into account post-IPO considerations in their initial exit decision, they would be choose an IPO as their initial exit mechanism with an even higher likelihood than if the choice were made based on the initial exit trade-offs alone (for example, if the decision were to made based on a simple comparison between these firms' valuations in an IPO versus in an acquisition).

5.2 Firm valuation and exit outcomes

In this section, we assess the payoffs associated with the different exit outcomes by computing the valuation of firms that go through each of the possible exit scenarios, i.e. direct acquisition and IPO in the first step, and, for firms that decide to go public, post-IPO acquisition, stand-alone, and delisting. We then assess the benefits and costs associated with each exit outcome by computing the valuation premium (or discount) received by a firm with respect to the valuation it would have obtained in alternative exit scenarios.

When comparing the valuations of firms going through different exit routes, we need to account for self-selection in the firm's choice. We therefore compute the valuation premium each firm receives in a given exit scenario by estimating the valuation it could have possibly obtained in other exit scenarios. For this purpose, we use propensity score matching procedures to mitigate the selection on observable characteristics, and find for each firm a comparable firm going through an alternative exit scenario, as follows. First, we estimate a firm's propensity to undertake a given exit route along the same firm-specific, industry-specific and market-specific dimensions used in the sequential logit model that determine the likelihood of an exit decision. With these propensity score values estimated by means of a logit regression, we match each firm to another firm going through the alternative scenario, within the same industry (two-digit SIC level) and year of exit, having the closest propensity score. We then define the valuation premium (or discount, if negative) received by each firm i by computing the logarithm of the ratio between its valuation and that obtained by its propensity score-matched firm in the other scenario. In line with Bayar and Chemmanur (2012), our valuation measure is the Enterprise Value to Sales ratio (EV/Sales).¹⁴ Valuation premium is then defined as follows:

$$\text{Valuation premium}_i = \log\left(\frac{EV/Sales_i}{EV/Sales_{peer,i}}\right)$$

Table 4 reports the valuations and valuation premia associated with the different exit scenarios, which are also represented in Figure 2. Panel A shows that the average EV/Sales implied by the takeover price of firms that are directly acquired is 1.9 (1.0 in median), which is lower than the 3.0 (1.8) EV/Sales implied by the offer price of firms that go public. Therefore, the average valuation received by companies choosing a direct acquisition as their initial exit mechanism is one third lower than that received by firms going through an IPO. Since, however, going public may not be a real option for all directly acquired firms, it is important to look at the valuation premium obtained by each IPO firm relative to an appropriate acquired firm having a similar propensity to undertake an IPO. We find that the valuation premium of IPOs over direct acquisitions, defined as the logarithm of the ratio of the EV/Sales obtained by a firm in an IPO (implied by the offer price) and the EV/Sales obtained by a similar firm in a direct acquisition (implied by

¹⁴ There are other valuation measures commonly used in literature, such as EV/EBITDA, EV/Book Value of Equity, or Tobin's Q. For many private firms, however, EBITDA and book value of equity are negative, therefore we use EV/Sales multiple to avoid estimation bias. The post-IPO acquisitions sample is restricted to 611 observations because the terms of the acquisition, including the valuation received by the target, were not disclosed for 37 of the 648 firms.

the takeover price), is positive and statistically different from zero. After controlling for industry, year of exit, and other observable firm- and market-specific characteristics affecting the choice between IPOs and acquisitions, firms get a 20.6% higher valuation in an IPO, on average, than the one they would have obtained in a direct acquisition. The existence and the magnitude of such a valuation premium associated with IPOs is consistent with that documented by the existing literature: see, e.g., Brau, Francis, and Kohers (2003), who finds that the average takeover payoff for private firms is 78% of an IPO payoff.

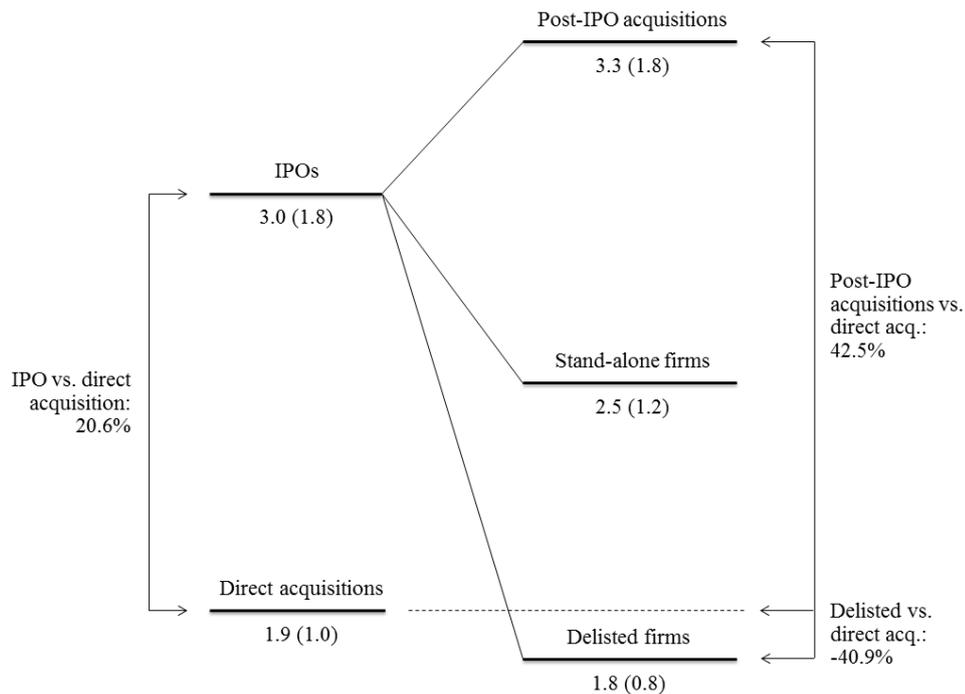


Figure 2: Valuation and valuation premium associated with each exit scenario.

Panel B of Table 4 shows the EV/Sales and the valuation premium or discount obtained by a firm that goes through each post-IPO scenario. Firms that are acquired after having conducted an IPO are characterized by the highest valuations. The average EV/Sales at which these firms are acquired is 3.3 (1.8 in median). On the other hand, firms that are delisted within three years of the IPO receive the lowest valuations, with an average EV/Sales of 1.8 (0.8 in median). The valuation of firms that remain stand-alone after the IPO is in between, with an average EV/Sales of 2.5 (1.2 in median). This documents that the benefit a firm may get from choosing an IPO as initial exit mechanism is the possibility to be subsequently acquired at a higher valuation; on the other hand, by going public a firm also faces the risk of being delisted at a lower valuation.

Firms completing a post-IPO acquisition are acquired at a higher valuation than that previously obtained at the time of the IPO, as the valuation premium of post-IPO acquisitions over IPOs is, on average, positive and significant at 25.6% (19.1% in median). By summing up the valuation premium obtained in an IPO and that obtained in a post-IPO acquisition, firms completing a post-IPO acquisition eventually receive a 42.5% average valuation premium over their comparable firms choosing a direct acquisition as their initial exit mechanism. On the other hand, the valuation of firms that end up being delisted is significantly lower than the valuation they previously obtained at the IPO. The average valuation discount of delisted firms with respect to their own IPO valuation is 55.7%. By summing up the valuation premium obtained in an IPO and the valuation discount incurred in a post-IPO delisting, firms that go public and are subsequently delisted from the stock market suffer from a 40.9% average valuation discount with respect to their comparable firms choosing a direct acquisition as their initial exit mechanism.

Overall, the evidence in Table 4 documents that firms that choose an IPO instead of a direct acquisition as initial exit mechanism can get substantial benefits but, at the same time, may face considerable costs. On one hand, the benefit of choosing an IPO as initial exit mechanism is associated with the possibility of being acquired at a significantly higher valuation than the one the firm could have obtained in a direct acquisition. On the other hand, the cost of choosing an IPO as initial exit mechanism is associated with the risk of being delisted from the stock market at a significantly lower valuation than the one the firm could have obtained in a direct acquisition. Therefore, with respect to the direct acquisition scenario, post-IPO acquisitions are a valuable exit route, while firms that end up being delisted are worse off.

5.3 Determinants of the valuation premium

In this section, we provide evidence using univariate and multivariate tests of our testable hypotheses formulated in Section 3.4 about the determinants of the valuation premium obtained by firms choosing an IPO as their initial exit mechanism, the valuation premium obtained by firms that are acquired post-IPO, as well as the determinants of the valuation discount incurred by firms being delisted post-IPO. Concerning post-IPO scenarios, we focus on post-IPO acquisitions and delistings because these represent the main benefits and costs, i.e. the positive and negative outcomes, faced by a firm that decides to go public at the initial exit stage. Remaining stand-alone after the IPO can be considered neither a cost, as it may prove the

firm's ability to survive independently, nor a benefit, as it may be a consequence of the firm's inability to find an acquirer.

In order to address any sample selection bias that may arise due to unobservable factors, we investigate the cross-sectional determinants of valuation premia using a two-step Heckman selection model. This allows us to control for the existence of unobservable factors, such as private information of firm insiders about the intrinsic quality of the firm, that simultaneously affect both the probability of a firm self-selecting its treatment (exit choice) and the treatment outcome (valuation premium). The procedure we use consists of a first stage logit regression model predicting each firm's probability of undertaking a given exit outcome, which determines the inverse Mills ratios. The independent variables in the first stage are the same as those used in the sequential logit analysis. The inverse Mills ratios calculated for each firm in the first stage capture unobservable information affecting both the firm's likelihood of going through a given exit outcome and the valuation premium it receives in this outcome. In the second stage, we then regress the valuation premium on a set of independent variables that include the observable covariates used in the sequential logit model and the inverse Mills ratios obtained in the first stage.

We first explain the determinants of the valuation premium obtained by firms choosing an IPO as their initial exit mechanism over those choosing a direct acquisition. We then analyze the determinants of the valuation premium of firms acquired post-IPO with respect to two valuation benchmarks, i.e. IPO valuation and valuation in a direct acquisition of the firm. Furthermore, we analyze the valuation discounts of firms delisted post-IPO, again with respect to their IPO valuation and their valuation in a direct acquisition. Finally, we complete our analysis by examining the valuation premia of firms in post-IPO acquisitions and the valuation discounts of firms delisted post-IPO using an alternative benchmark, namely, the valuation of stand-alone firms post-IPO.

5.3.1 Valuation premia of IPOs over direct acquisition valuations

Table 5 reports the results of our univariate and multivariate tests regarding the valuation premia obtained by firms in IPOs over the valuation in a potential direct acquisition. The univariate analysis shows that the average and median values of the valuation premium, defined as the logarithm of the ratio of the EV/Sales of a firm in an IPO (implied by the offer price) over the EV/Sales of a propensity score-matched firm in a direct acquisition (implied by the takeover price), by distinguishing IPOs that have a below- and

above-median value of the variables reported in rows.¹⁵ In the multivariate analysis (Heckman procedure), the first step models the likelihood of firms choosing an IPO on the sample of all private firms facing an exit decision, and the second step explains the cross-sectional variation of the valuation premium obtained by IPO firms by correcting for selectivity bias. All independent variables are measured at the last fiscal year before the exit decision.

The results of our univariate analysis reveal that firms with greater sales growth and lower market share benefit from a significantly higher premium, on average (13.7 and 16.6 percentage points higher, respectively). While the evidence of the sales growth variable is consistent with the view that more viable firms receive higher valuations, the effect of market share is not (this univariate result will later be shown to be reversed in our multivariate analysis, however). Smaller and younger firms and those affiliated with top-tier underwriters also receive a significantly higher premium, supporting the role played by size and underwriter reputation in reducing the amount of information asymmetry faced by firm outsiders.

We now discuss the results of our multivariate analysis. The second step of our estimation shows that the coefficients of the sales growth and market share variables are positive and significant. This provides support for the hypothesis that, within firms that exceed the product market viability threshold required to go public, those that are more viable against product market competition obtain a higher valuation premium. The valuation premium received by IPO firms decreases with firm size, consistent with the evidence of the univariate analysis. Information asymmetry-based explanations would predict that larger firms, for which potential acquirers would face a lower extent of information asymmetry, receive higher valuations, in contrast to the above evidence. On the other hand, smaller firms may be perceived as those embedding greater growth opportunities, which may lead to a higher valuation premium in an IPO. The coefficient of the underwriter reputation dummy is positive and significant, implying that firms whose IPOs are backed by top-tier underwriters obtain a higher valuation premium. This is consistent with the idea that underwriter reputation is an effective mechanism to reduce the extent of information asymmetry a potential acquirer may face when considering the newly listed firm as a target. Among our control variables, market momentum shows a positive and significant coefficient, documenting that firms going public during favorable periods tend to receive higher valuation premia over direct acquisitions.

¹⁵ We exclude the private benefits dummy from the second step estimation as we do not have any theoretical motivation to hypothesize an influence on valuation premium.

5.3.2 *Valuation premia in post-IPO acquisitions over valuations in IPOs and direct acquisitions*

We now turn to discuss the estimates of the determinants of the valuation premium received by firms in a post-IPO acquisition with respect to two different benchmarks: (1) their own valuation at the time of the IPO; (2) the valuation of their propensity score-matched firm choosing a direct acquisition as initial exit mechanism. We first focus on the analysis of the valuation premium of post-IPO acquisitions over IPOs, whose evidence is reported in Table 6. The sample is composed of firms that go public and are subsequently acquired (within three years), and the dependent variable is the valuation premium, defined as the logarithm of the ratio of the EV/Sales at which the firm is acquired after the IPO (implied by the takeover price) over the EV/Sales at which the firm previously went public (implied by the offer price). All independent variables are measured at the IPO.

The results of our univariate analysis show limited effects of product market proxies on the valuation premium a firm receives from the IPO to the post-IPO acquisition. On the other hand, underwriter reputation seems to play an important role, as firms backed by a top-tier underwriter in their IPOs receive an average valuation premium of 51.1%, which decreases to 20.4% in the case of less reputable underwriters. Similarly, firms with a narrower bid-ask spread are acquired at an average 34.9% premium over their IPO valuation, compared to the 15.6% premium realized by firms with a below median level of bid-ask spread. Consistent with the idea that firms facing greater growth opportunities receive higher valuations, firms with an above median growth opportunities component of their market to book ratio are characterized by an average 37.3% valuation premium, as opposed to the 13.9% of firms with a below median value of growth opportunities. Finally, firms listed on exchange-regulated markets seem to receive a lower premium (13.6% vs. 33.6% on average).

We now discuss the results of our multivariate analysis presented in Table 6, where we control for selection bias using a two-step Heckman procedure. The coefficient of the sales growth variable is positive and significant, documenting that firms experiencing greater sales growth obtain a higher valuation premium from the IPO to a subsequent post-IPO acquisition. This is consistent with the idea that firms are likely to receive higher post-IPO acquisition bids if they are viewed by potential acquirers as being successful in the product market. The coefficient of the private benefits dummy, however, is not significant, suggesting that a firm's top management does not require a significantly higher bid from an acquirer (for a given intrinsic firm

value) to agree to a post-IPO acquisition. Concerning our information asymmetry proxies, we find that the coefficients of analyst coverage and bid-ask spread variables are significant with the expected sign. Therefore, firms experiencing greater analyst coverage and lower bid-ask spread receive higher valuation premia, consistent with the prediction that acquirers are likely to make higher bids for firms for which they face a smaller extent of information asymmetry (in other words, for firms that are easier to value). The univariate result of lower valuation premia for exchange-regulated market IPOs is not confirmed at a multivariate level.

We now turn to the determinants of the valuation premium obtained by a firm in a post-IPO acquisition over its potential valuation in a direct acquisition. Table 7 reports the results of our univariate and multivariate analyses. The sample is still composed of firms that are acquired post-IPO, i.e. firms going public and being subsequently acquired (within three years), while the valuation premium is defined as the logarithm of the ratio of the EV/Sales at which a firm is acquired after the IPO over the EV/Sales at which a propensity score-matched firm is acquired in a direct acquisition. It can also be viewed as the sum of the valuation premium obtained by a firm in an IPO over a direct acquisition, and the valuation premium obtained by the same firm in a post-IPO acquisition over its previous IPO valuation.

The results of our univariate analysis confirm the previously documented effects of a firm's product market viability and information asymmetry on its overall valuation premium as well. The evidence of our multivariate analysis confirms that, consistent with both the valuation premium of IPOs over direct acquisition valuations and that of post-IPO acquisitions over IPO valuations increasing with a firm's sales growth rate, the valuation premium of a firm in a post-IPO acquisition over its potential direct acquisition valuation increases with its sales growth rate. This is also consistent with our evidence presented earlier that acquirers make higher post-IPO acquisition bids for firms that are more successful in the product market. Our proxies for the residual information asymmetry faced by potential acquirers after the IPO, namely analyst coverage and bid-ask spread, have significant coefficients in the directions suggested by our testable hypotheses and consistent with the earlier evidence presented. These results suggest that firms that are able to reduce information asymmetry to a greater extent through the IPO process receive more favorable acquisition bids after the IPO. Finally, family firms are found to receive higher valuation premia, consistent

with the argument that family owners tend to require an additional compensation for giving up the noneconomic benefits they attach to the control of the firm.

The results of our empirical analyses discussed so far also allow to assess whether the effects of product market viability and information asymmetry on valuation premia come into play only at the initial exit stage, i.e. is reflected only in the IPO valuation premium over a direct acquisition valuation, or only at the post-IPO stage, i.e. reflected only in the post-IPO acquisition valuation premium, or is reflected at both stages. A comparison of the evidence presented in Tables 5 and 6 reveals that the valuation premium associated with firms being more viable in the product market, as proxied by firms' sales growth, is reflected both in firms IPO valuation premia and in post-IPO acquisition valuation premia. This means that a higher product market viability is rewarded both by investors in an IPO and by acquirers in a post-IPO bid. The positive effect of a firm's market share, however, is reflected positively in the IPO valuation premium, but not in the post-IPO acquisition valuation premium. As far as variables reflecting the effect of the extent of information asymmetry facing a firm are concerned, we find different effects for different measures of information asymmetry. Thus, the value-enhancing effect of underwriter reputation is entirely reflected positively in the IPO valuation premia, but not in post-IPO acquisition valuation premia. This is not too surprising, since one would expect the certification effect of a high reputation underwriter to be strongest at the time of the IPO. On the other hand, the effect of analyst coverage is insignificant as far as the IPO valuation premia are concerned, but positively affect post-IPO acquisition premia. This is again consistent with the view that, at the time of the IPO, the underwriter has the primary role of producing and transmitting information about the firm to potential investors, while post-IPO, the information production role is taken over by analysts.

Overall, the results of our empirical analysis presented here on the valuation premia obtained by firms in post-IPO acquisitions (measured over IPO valuations and over potential direct acquisition valuations) strongly support the hypotheses we developed earlier regarding the potential effects of a firm's product market viability and information asymmetry on such valuation premia.

5.3.3 Valuation discounts of delisted firms with respect to IPO and direct acquisition valuations

We now discuss the results of our empirical analysis on the determinants of the valuation discount received by firms going public and which are subsequently delisted with respect to two benchmarks: (1)

their own IPO valuation; (2) the valuation of matching firms (obtained using a propensity score-matching procedure) choosing a direct acquisition as their initial exit mechanism. We first focus on the valuation discount of delisted firms with respect to IPO valuations. The results of our univariate and multivariate analyses are reported in Table 8. The sample is composed of delisted firms, i.e. firms going public and being subsequently delisted (within three years), and the dependent variable is valuation discount, defined as the logarithm of the ratio of the EV/Sales of a firm two months prior to delisting (implied by the current stock price) over the EV/Sales at which the same firm previously went public (implied by the offer price). All independent variables are measured at the IPO.

The univariate analysis in Table 8 reveals that delisted firms with below median market share in their industry are on average associated with a larger valuation discount with respect to their IPO valuations (-100.8%) compared to firms with above median market share (-10.6%). The difference in the average valuation discount is similar between firms that operate in an industry where there is a dominant player (-137.1%) and firms in other industries (-49.1%). Consistent with the idea that firms characterized by a lower level of information asymmetry tend to receive better valuations, delisted firms with lower bid-ask spread are associated with a significantly smaller discount (-17.8%) than firms with a higher bid-ask spread (-93.6%), on average.

We now discuss the results of our multivariate analysis, developed using a two-step Heckman selection model. Our univariate results on the effects of a firm's market share and the presence of a big player in its industry do not all hold up in such a multivariate setting. In fact, in this setting, most product market-related variables seem to be unimportant in explaining the cross-sectional variation in the valuation discount borne by delisted firms over their previous IPO valuation. What seems to most important in determining the extent of the valuation discount is the firm's residual level of information asymmetry post-IPO, as documented by the significant coefficients of the underwriter reputation and bid-ask spread variables. Consistent with the results of our univariate tests, firms affected by lower information asymmetry, as proxied by the presence of a top-tier underwriter and lower bid-ask spread, incur a smaller valuation discount. The family status is also important in explaining valuation discount, as family firms are found to suffer from a larger discount at the time of delisting. This might be explained by the market penalizing these

firms when not performing well, due to the presence of more severe agency conflicts and information asymmetry issues that may undermine their recovery prospects.

We now turn to the analysis of the determinants of the valuation discount of delisted firms over direct acquisitions. Table 9 reports the results of our univariate and multivariate analyses. The sample is still composed of firms that choose an IPO as their initial exit mechanism and are subsequently delisted. The valuation discount is defined as the logarithm of the ratio of the EV/Sales of a firm two months prior to delisting over the EV/Sales at which a propensity score-matched firm that is acquired through a direct acquisition (i.e., a firm that chose a direct acquisition as its initial exit mechanism). It can also be viewed as the sum of the valuation premium obtained by the firm at the IPO over its valuation in a potential direct acquisition, and the valuation discount incurred by the firm at delisting post-IPO, measured with respect to its previous IPO valuation (assigning each component variable its appropriate algebraic sign).

The results of our univariate analysis show that a firm's market share seems to play a role. Firms with higher market share report an average (positive) premium of 22.6%, as opposed to the -104.4% discount associated with firms with below median market share. The results also show that, on average, the valuation discount with respect to a direct acquisition becomes less pronounced among larger firms. Consistent with the prediction that firms characterized by a larger extent of information asymmetry receive larger discounts, we find that firms affiliated with a top-tier IPO underwriter, receiving greater analyst coverage, and with a lower bid-ask spread are less penalized.

We now discuss the results of our multivariate analysis conducted using a two-step Heckman selection model. The coefficient of the sales growth variable is negative and significant, implying that firms with higher pre-IPO sales growth rates suffer from a larger valuation discount over direct acquisitions. This finding is driven by the fact that a firm characterized by a higher sales growth at the time of its initial exit decision would potentially have obtained a higher valuation in a direct acquisition, resulting in a larger discount when the above larger direct acquisition valuation is compared to the valuation the firm gets if it is delisted after the IPO (in other words, the larger sales growth at the time of initial exit does not lead to a larger valuation at delisting). Similar to the case of the multivariate analysis discussed earlier of the delisting valuation discount over IPO valuation presented earlier, here also the other product market variables, such as the presence of a big player in the product market and the firm's market share in the product market, do not

play a significant role in our Heckman style multivariate analysis results (in determining the firm's valuation discount upon delisting relative to its potential direct acquisition valuation). Further, similar to that earlier analysis, the most important variable driving the valuation discount in our multivariate analysis results is the residual information asymmetry, as evidenced by the fact that the coefficients of the underwriter reputation and bid-ask spread variable are both significant. The evidence previously documented about the larger discount incurred by family firms with respect to their IPO valuation is confirmed also when compared to the direct acquisition valuation.

It is worth noting here that, for an entrepreneur estimating the costs and benefits arising from different post-IPO scenarios at the time of his initial exit choice between IPO and acquisition, the results of both our univariate analysis of valuation discounts upon delisting and our Heckman two-step multivariate analysis of valuation discounts (as well as the results of our sequential logit regression analysis of the determinants of alternative post-IPO scenarios presented in table 3) may be helpful. This is because the second step of our Heckman analysis, by itself, provides insights only into the determinants of the valuation discount *conditional* on a private firm having some characteristics that make it more likely to be delisted post-IPO (showing that the most important determinant of this conditional valuation premium is the extent of information asymmetry, as proxied by underwriter reputation and bid-ask spread). However, at the time of his initial exit decision, what matters to an entrepreneur is the *ex ante* expected costs and benefits arising from each post-IPO scenario. For example, we know from our sequential logit regressions (presented in Table 3) that the firm's growth opportunities significantly impact its probability of being delisted post-IPO: firms that are weaker in the product market in terms of this measure are likely to suffer a higher *ex ante expected* valuation discount if they choose an IPO as their exit route (arising from a higher probability of being delisted associated with this variable and suffering the associated valuation discount, a measure of which is provided by our univariate results).¹⁶ In summary, since an entrepreneur will make his initial exit

¹⁶It is useful to consider an example of how the various empirical analyses we present in this paper fit together in helping an entrepreneur to calculate, at the time of his initial exit decision, the expected cost to his firm arising from delisting. First, our sequential logit analysis presented in Table 3 would inform the entrepreneur that the ability to reduce its information asymmetry when going public (e.g., by affiliating with a reputable underwriter) would considerably affect his firm's probability of being delisted. Further, the results of our univariate analysis presented in Table 9 would inform him that his valuation discount upon delisting if information asymmetry is not effectively reduced would be very large (the average valuation discount reported by firms with an above median level of bid-ask spread is -82%). Finally, our Heckman two-step analysis would inform the entrepreneur that, conditional on the firm having characteristics that make it more likely to be delisted, the most crucial variable affecting his firm's valuation discount is the reputation of its IPO underwriter and the level of bid-ask spread.

choice based on his *ex ante* expected costs and benefits arising from the two post-IPO scenarios discussed in this paper (in addition to the other considerations affecting his initial exit trade-off, discussed in section 3.1 and empirically analyzed in section 5.1), both our univariate as well as our multivariate analyses of the valuation discount associated with delisting, as well as the results of our sequential logit analysis of the determinants of alternative post-IPO scenarios, may be useful to entrepreneurs in making this exit decision.

6. Additional Robustness Tests

6.1 Ownership structure at IPO vs. at post-IPO acquisition

In our empirical analysis, we do not require that the valuation premium of a post-IPO acquisition is realized by pre-IPO shareholders. All we require is that insiders be aware, at the time of their initial exit decision, of the possibility for the firm to be acquired at a higher valuation (and to be delisted at a lower valuation) after the IPO, which in turn has implications on the initial trade-off between IPO and direct acquisition. Nevertheless, one could argue that, for post-IPO considerations to matter at the initial stage, the ownership structure of the firm does not have to undergo radical changes from the time of the IPO to that of the subsequent acquisition. In other words, the benefits of being acquired post-IPO should (at least partially) accrue to the same shareholders who face the initial exit trade-off, since otherwise it may be argued that such considerations may not be very important when making the initial exit choice. We therefore check whether and to what extent the ownership structures of our sample of firms that are acquired post-IPO change from the IPO to the subsequent acquisition.

We find no radical changes in a firm's ownership structure in the midst of their exit process. In 575 out of 648 (88.7%) observations, at least one shareholder who sells in the post-IPO acquisition already had an equity stake in the firm at the time of the IPO. Thus, in approximately 9 out of 10 firms, the valuation premium obtained in a post-IPO acquisition accrues to the same shareholders who faced the initial trade-off between IPO and acquisition. This provides further support to our view that the possibility of being acquired at a higher valuation after going public may be taken into consideration by firm insiders when making the initial exit decision. We also keep track of the original shareholders' ownership stake between the IPO and the subsequent acquisition, and find that, on average, controlling shareholders own 63.6% of the firm before taking it public, and sell 6.4% at the IPO. Given that the average amount of primary shares offered is 30.6%

of the firm's pre-IPO shares outstanding, this leads to a 43.8% post-IPO equity stake. Between the IPO and the subsequent acquisition, no relevant changes occur in the ownership structure, as in most cases the controlling shareholders do not sell at all. Finally, they sell on average 34.7% of the firm at the acquisition, resulting in a residual stake of 7.0% after the deal. In light of this pattern, we can argue that the valuation premium obtained in a post-IPO acquisition accrues to shareholders who face the initial exit decision between an IPO and a direct acquisition.

6.2 *Venture capitalists*

An important aspect of a firm's ownership structure with respect to its exit decision is the presence of venture capitalists among the existing shareholders. According to the theoretical setting of Bayar and Chemmanur (2011), the exit incentives of a VC, which are almost exclusively driven by financial considerations, may differ from those of an entrepreneur. In our sample, VCs hold pre-IPO equity stakes in 207 out of 648 (31.9%) firms that go public and are acquired shortly thereafter. In this section, we check whether the potential wedge between the exit preferences of entrepreneurs and VCs has implications on the valuation premium of post-IPO acquisitions and its determinants. To this extent, we split our sample based on the presence of a VC among a firm's shareholders. In unreported tests, we find that VC backed firms obtain a higher valuation premium in a post-IPO acquisition over a direct acquisition than non-VC backed firms. The average premium amounts to 47.6% (39.5% in median) for VC backed firms, and 40.1% (37.2% in median) for non-VC backed firms. The results of our multivariate analysis of the determinants of the valuation premium are reported in Table 10. The role played by a firm's product market viability is consistent with the evidence from the aggregate sample, as firms characterized by higher sales growth receive indeed higher premia, whether VC backed or not, although the effect is statistically stronger among non-VC backed IPOs. Also the statistical significance of our IPO-related information asymmetry proxies varies according to the presence of a VC. In particular, the effects of analyst coverage and bid-ask spread on the valuation premium tend to be more pronounced among non-VC backed firms, possibly because the certification effect of VCs may already reduce information asymmetry in firms backed by venture capitalists.

6.3 *Stand-alone firm valuations as an alternative benchmark*

We integrate our analysis of the determinants of valuation premium by adopting a different valuation benchmark, namely, the valuation of stand-alone firms post-IPO. We therefore compare the valuation of a

firm that is acquired post-IPO and of a firm that is delisted post-IPO with that of a propensity score-matched firm that goes public and remains stand-alone. While our previous analyses imply a comparison of the same firm's valuation at different points in time (e.g., at the post-IPO acquisition and at the IPO), potentially raising concerns about changing market conditions and other factors that may play a role in the meantime, we now compare firm valuations at the same point in time. We therefore compute (1) the valuation premium of post-IPO acquisitions over stand-alone firms, defined as the logarithm of the ratio of the EV/Sales at which a firm is acquired post-IPO and the EV/Sales of a propensity score-matched stand-alone firm at the day of the acquisition; (2) the valuation discount of delisted firms over stand-alone firms, defined as the logarithm of the ratio of the EV/Sales of a firm two months prior to delisting and the EV/Sales of a propensity score-matched stand-alone firm in the same day.

Table 11 reports the results of our multivariate estimation. We first discuss the left-hand side of the table, where the dependent variable is the valuation premium of post-IPO acquisitions over stand-alone firms. The coefficient of the sales growth variable is positive and significant, again supporting the idea that firms that are more successful in the product market receive higher premia. Also, the effect of a firm's extent of information asymmetry is still in place, with firms affected by lower residual information asymmetry, as proxied by lower bid-ask spread, being associated with higher valuation premia. Overall, our evidence presented earlier is robust to the use of stand-alone firms as an alternative benchmark, since it supports our hypotheses on the effects of a firm's product market viability and information asymmetry on the valuation premium. We now turn to the discussion of the analysis of the valuation discount incurred by delisted firms over stand-alone firms. Underwriter reputation and bid-ask spread are still important predictors of the extent of the valuation discount associated with delisted firms, as suggested by their significant coefficients. The extent of information asymmetry reduced by going public is found to alleviate the valuation discount suffered by delisted firms also using stand-alone firms as alternative benchmark. Overall, the results are robust to the use of stand-alone firms as an alternative benchmark, and offer some additional evidence on the determinants of the valuation discount. Again, the predictions of our hypotheses on the effects of a firm's product market viability and information asymmetry on the valuation discount upon delisting find support here.

6.4 Alternative time horizons

Post-IPO acquisitions are defined throughout the paper as those conducted by firms that go public and are acquired within three years. As the time between a firm's IPO and its subsequent acquisition becomes shorter, the probability that its ownership structure undergoes radical changes in the middle of the two transactions decreases. Although a shorter time horizon implies a lower number of observations for post-IPO scenarios other than the stand-alone, we analyze the determinants of a firm's exit route by assuming two-year and one-year time horizons since the IPO date. Of the 648 firms acquired within three years of their IPO, 145 are acquired in the first year, and 374 within two years; of the 140 delisted firms, 16 are delisted in the first year, and 76 within two years. In unreported tests, we find that the average valuation premium of post-IPO acquisitions completed within one year is 73.1% (54.6% in median), and that of post-IPO acquisitions completed within two years is 55.2% (48.6%), respectively. This suggests that the valuation premium is higher for IPO firms that are acquired sooner. We also analyze the determinants of the valuation premium obtained by firms acquired within one and two years. The results are presented in Table 12.

We first discuss the evidence from the sequential logit regressions. The role played by a firm's product market viability, as proxied by sales growth, is robust to different post-IPO time horizons. Consistent with the evidence from our previous 3-year analysis, the extent of residual information asymmetry faced by firm outsiders is a significant determinant of the likelihoods of a firm's post-IPO scenarios. Firms that receive greater analyst coverage and are characterized by lower bid-ask spreads are more likely to be acquired, either within one or two years of their IPO. On the other hand, firms characterized by smaller analyst coverage are more likely to be delisted. Turning to the analysis of the determinants of the valuation premium received in a post-IPO acquisition, we still find evidence of the effects of product market viability, as proxied by sales growth, and information asymmetry, as proxied by analyst coverage and bid-ask spread. In particular, the effect of bid-ask spread diminishes as the time horizon becomes shorter, while that of analyst coverage remains significant at the 1% level in both settings.

7. Conclusions

In this paper, we used a dataset of European private firms and undertook a dynamic empirical analysis of a private firm's exit decision, previously modeled in the literature as a dichotomous, one-time choice between IPOs and acquisitions. We studied how post-IPO considerations, such as the benefits arising

from a potential post-IPO acquisition at a higher valuation, and the costs arising from a potential delisting post-IPO at a lower valuation, alter the initial exit trade-off between IPOs and acquisitions by taking into account the institutional peculiarities of the European setting, both relative to the U.S. and across European countries. Using a sequential logit model, we showed that firms that are more viable against product market competition, characterized by larger private benefits of control, or lower information asymmetry, are more likely to choose an IPO over a direct acquisition as their initial exit mechanism. Differently from the U.S., larger firms do not face a higher probability to go public due to the presence of exchange-regulated markets that facilitate small firm IPOs. Post-IPO, firms that are more viable in the product market and are able to reduce information asymmetry to a greater extent using the IPO process are more likely to be acquired, while firms characterized by lower product market viability and higher residual information asymmetry are more likely to be delisted. Family firms are more likely to remain stand-alone.

We also quantified the valuation benefits and costs accruing to firms under alternative post-IPO scenarios. Thus, our propensity score matching analysis reveals that firms that go public and are subsequently acquired sell at a 42.5% premium, on average, over the valuation they could have obtained in a direct acquisition. The largest fraction of this gain is realized at the second stage, i.e. from a firm's IPO to the time of its subsequent acquisition. On the other hand, delisted firms incur an average valuation discount of 40.9% compared to a direct acquisition. This shows that, while choosing an IPO instead of a direct acquisition may lead to substantial benefits, it may also involve considerable downside risk to private firms (relative to direct acquisitions). We tested several hypotheses regarding the determinants of the valuation premium received by firms in a post-IPO acquisition, and of the valuation discount incurred by firms in a post-IPO delisting. We found that, among firms that are acquired post-IPO, those characterized by higher product market viability, lower residual information asymmetry faced by potential acquirers, and family firms receive higher valuation premia over their previous IPO valuations, and over propensity score-matched firms choosing a direct acquisition as initial exit mechanism. On the other hand, delisted firms affected by a higher level of information asymmetry suffer from larger valuation discounts. Overall, the results of our empirical analysis show how private firms may be able to incorporate the benefits and costs arising from post-IPO considerations into their initial exit decisions, and suggests how such incorporation may alter their initial exit choices.

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Table 1. Geographic and year distribution of the sample. Panel A (B) shows the geographic (year) distribution of our sample of European firms from 1995 to 2012 going through each of the exit scenarios. The initial exit choice is between being acquired as a private firm (direct acquisition) and going public (IPO), while post-IPO scenarios refer to firms that chose an IPO as initial exit mechanism. Post-IPO acquisitions are firms acquired within three years of the IPO; Stand-alone are firms still alive as independent firms at the three-year IPO anniversary; Delisted are firms delisted from the stock market within three years of the IPO. In Panel A, other countries include Belgium, The Netherlands, and Portugal from 2005 onwards (when the stock exchanges of these countries merged into Euronext), and Austria, Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Norway, Spain, Sweden, and Switzerland from 2006 onwards.

<i>Panel A. Country distribution</i>	Initial exit choice		Post-IPO scenarios		
	Direct acquisition	IPO	Post-IPO acquisition	Stand-alone	Delisted
United Kingdom	2,904	1,894	301	1,491	102
France	628	673	93	559	21
Germany	266	551	95	443	13
Italy	241	218	52	160	6
Sweden	197	84	24	59	1
Others	1,497	284	83	192	9
<i>Panel B. Year distribution</i>					
1995	277	78	21	56	1
1996	263	206	37	162	7
1997	245	200	33	156	11
1998	329	251	47	199	5
1999	361	333	54	269	10
2000	410	535	87	417	31
2001	293	180	21	154	5
2002	184	107	11	91	5
2003	180	81	7	70	4
2004	281	275	42	207	26
2005	330	393	72	306	15
2006	772	507	107	390	10
2007	878	448	88	356	4
2008	618	83	16	60	7
2009	312	27	5	11	11
Total	5,733	3,704	648	2,904	152

Table 2. Summary statistics and univariate tests by exit scenario. Summary statistics and univariate tests for firms that go through each of the possible exit scenarios. Panel A refers to the first step of a firm's exit decision (IPO vs. direct acquisition). Panel B refers to the second step of a firm's exit decision (post-IPO scenarios). All variables are measured at the initial exit decision. *Sales growth* is the firm's average annual change in sales from year -3 to -1 or from year -2 to -1, depending on data availability (available for 2,876 direct acquisitions and 2,639 IPOs); *Market share* is the firm's market share in terms of sales in its 3-digit SIC industry; *Big player* is a dummy equal to 1 if a company in the firm's industry (3-digit SIC level) has a market share of 30% or more; *Private benefits* is a dummy equal to 1 for firms operating in industries with 2-digit SIC codes 13 (oil & gas production), 28 (chemicals and allied products), 29 (oil refining), and 37 (transportation equipment), based on Rajan and Wulf (2006); *Sales* is last fiscal year sales; *Age* is firm age in years; *Underwriter reputation* is equal to 1 for underwriters with an updated Carter-Manaster rank of 8 or more; *Analyst coverage* is the number of analysts covering the firm at the IPO; *Bid-Ask spread* is the average ratio of daily bid-ask spread divided by the midpoint of bid and ask prices, from 1 month after IPO to the minimum between 13 months after IPO and 2 months before acquisition/delisting; *Excess return* is the firm's buy-and-hold stock return over 3 years after IPO or up to 2 months before acquisition/delisting, minus the FTSE Euromid index buy-and-hold return over the same period; *Growth opportunities* is the growth opportunities fraction of the firms' market-to-book ratio, i.e. $\ln(V/B)$, where V=intrinsic value, B=book value of equity; *Misvaluation* is the misvaluation fraction of the firm's market-to-book ratio, i.e. $\ln(M/V)$, where M=market value, V=intrinsic value of equity; *Exchange-regulated market* is a dummy equal to 1 if the firm has gone public on a second-tier, exchange-regulated market; *Family* is a dummy equal to 1 for family firms, defined as in Faccio and Lang (2002); *V/C ratio* is the ultimate owner's voting rights divided by cash flow rights; *VC backing* is equal to 1 for venture capital backed IPOs; *Leverage* is last fiscal year total debt to total assets; *Market momentum* is the FTSE Euromid index return over the 100 days prior to IPO/acquisition. All monetary values are in real terms. Tests for the difference in means (t-test) and medians (Wilcoxon-Mann-Whitney test) are between Direct acquisitions and IPOs in Panel A, and with respect to the Stand-alone group in Panel B. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively.

<i>Panel A. First step</i> <i>(IPO vs. direct acquisition)</i>	Direct acquisitions (5,733 obs.)		IPOs (3,704 obs.)		Difference IPOs - Direct Acq.	
	<i>average</i>	<i>median</i>	<i>average</i>	<i>median</i>	<i>average</i>	<i>median</i>
Sales growth (%)	49.9	11.3	97.4	60.6	47.5***	49.3***
Market share (%)	0.4	0.0	1.5	0.1	1.1***	0.1***
Big player (%)	15.9	0.0	13.9	0.0	-2.0**	0.0**
Private benefits (%)	4.7	0.0	13.1	0.0	8.4***	0.0***
Sales (€m)	61.8	11.3	272.1	14.3	210.3***	3.0**
Age (years)	17.1	11.0	15.6	7.0	-1.5**	-4.0***
Leverage (%)	24.4	23.0	28.7	17.2	4.3***	-5.8***
Market momentum (%)	2.9	3.2	5.1	4.4	2.2***	1.2***

<i>Panel B. Second step</i> <i>(post-IPO scenarios)</i>	Post-IPO acquisitions (648 obs.)		Stand-alone (2,904 obs.)		Delisted (152 obs.)		Difference Post-IPO acq.-Stand-alone		Difference Delisted - Stand-alone	
	<i>average</i>	<i>median</i>	<i>average</i>	<i>median</i>	<i>average</i>	<i>median</i>	<i>average</i>	<i>median</i>	<i>average</i>	<i>median</i>
	Sales growth (%)	137.1	52.0	92.2	48.8	114.1	70.1	44.9***	3.2*	21.9*
Market share (%)	0.9	0.0	1.7	0.1	0.5	0.0	-0.8**	-0.1	-1.2	-0.1
Big player (%)	17.1	0.0	13.5	0.0	7.5	0.0	3.6**	0.0**	-6.0	0.0
Private benefits (%)	11.2	0.0	13.1	0.0	21.5	0.0	-1.9	0.0	8.4***	0.0***
Sales (€m)	142.1	22.8	310.3	14.1	96.9	4.7	-168.2	8.7***	-213.4	-9.4**
Age (years)	15.3	7.0	16.0	7.0	8.6	5.0	-0.7	0.0**	-7.4*	-2.0**
Underwriter reputation (%)	17.0	0.0	11.7	0.0	10.4	0.0	5.3***	0.0***	-1.3	0.0
Analyst coverage	2.0	2.0	1.7	1.0	1.2	1.0	0.3***	1.0**	-0.5***	0.0***
Bid-Ask spread (%)	4.3	3.0	5.1	2.7	10.5	6.0	-0.8**	0.3**	5.4***	3.3***
Excess return (%)	-9.5	-13.5	-7.8	-32.0	-47.8	-57.5	-1.7	18.5**	-40.0**	-25.5***
Growth opportunities Ln(V/B)	0.4	0.4	0.3	0.3	0.2	0.2	0.1**	0.1**	-0.1***	-0.1***
Misvaluation Ln(M/V)	0.4	0.1	1.0	0.7	1.1	1.0	-0.6**	-0.6***	0.1	0.3*
Exchange-regulated market (%)	40.2	0.0	44.7	0.0	63.8	100.0	-4.5**	0.0**	19.1**	100.0**
Family (%)	43.8	0.0	50.0	0.0	42.5	0.0	-6.2***	0.0***	-7.5	0.0
V/C ratio (%)	117.5	100.0	114.0	100.0	116.8	100.0	3.5***	0.0	2.8	0.0
VC backing (%)	31.9	0.0	35.8	0.0	42.9	0.0	-3.9**	0.0**	7.1	0.0
Leverage (%)	30.1	20.4	28.4	16.2	27.7	18.1	1.7**	4.2***	-0.7	1.9
Market momentum (%)	5.1	4.5	5.1	4.3	4.8	3.9	0.0	0.2	-0.3	-0.4

Table 3. Sequential logit analysis of the determinants of a private firm's exit scenarios. The first step models a private firm's likelihood of choosing an IPO vs. a direct acquisition as initial exit mechanism (dependent variable is a dummy equal to 1 if the firm goes public). The second step models a newly listed firm's likelihood of going through each of the post-IPO scenarios (dependent variable is categorical and identifies three post-IPO scenarios, namely post-IPO acquisition, stand-alone, and delisting, with stand-alone as base outcome). Panel A reports estimates on the full sample and on the subsample with available sales growth. Panel B reports estimates by distinguishing firms going public on main and exchange-regulated markets (only firms with less than €50m in sales are included in the first step of the exchange-regulated markets model). Panel C reports country-level estimates of firms based in UK, France, and Germany. Independent variables are defined in Table 2. Sales is the log of the firm's last fiscal year sales. Age is the log of 1 plus firm age (in years). Country, year, and industry fixed effects are included. Heteroskedasticity corrected clustered robust z-statistics are in brackets. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

<i>Panel A</i>	All sample			Sales growth available		
	IPO vs. direct acquisition	Acquisition vs. Stand-alone	Delisting vs. Stand-alone	IPO vs. direct acquisition	Acquisition vs. Stand-alone	Delisting vs. Stand-alone
	(1)	(2)	(3)	(4)	(5)	(6)
Sales growth				0.25*** (9.52)	0.21*** (5.66)	-0.04 (-0.44)
Market share	0.08*** (5.23)	-0.03** (-2.04)	-0.03* (-1.65)	0.07*** (5.06)	-0.03* (-1.70)	-0.02 (-1.62)
Big player	-0.24*** (-2.75)	0.20 (1.18)	-0.98 (-1.53)	-0.23*** (-2.71)	0.27 (1.46)	-1.22 (-1.57)
Private benefits	1.31*** (9.84)	-0.20 (-1.07)	0.52 (1.49)	1.33*** (9.26)	-0.29 (-1.30)	0.60 (1.57)
Sales	0.01 (0.33)	0.06* (2.06)	-0.05 (-0.64)	0.04* (1.90)	0.11** (2.46)	-0.12 (-1.25)
Age	-0.48*** (-11.73)	-0.17*** (-2.74)	-0.26* (-1.74)	-0.14*** (-2.89)	-0.14* (-1.65)	-0.34* (-1.66)
Underwriter reputation		0.34* (1.93)	-0.84* (-1.89)		0.18 (0.90)	-0.93* (-1.94)
Analyst coverage		0.18*** (3.48)	-1.58** (-2.25)		0.15*** (2.94)	-1.39* (-1.87)
Bid-ask spread		-5.00*** (-3.38)	3.70*** (2.64)		-5.42*** (-3.20)	3.35*** (2.61)
Excess return		-0.05 (-1.20)	-1.17*** (-3.42)		-0.06 (-1.39)	-1.23*** (-3.01)
Growth opportunities		4.47*** (9.52)	-6.02*** (-3.74)		4.47*** (8.87)	-5.39*** (-3.06)
Misvaluation		-0.98*** (-6.22)	0.09 (0.66)		-1.01*** (-5.58)	0.07 (0.46)
Exch-regulated market		-0.14 (-0.51)	1.21*** (3.23)		-0.29 (-0.88)	1.25*** (3.21)
Family		-0.27** (-2.19)	-0.92*** (-3.15)		-0.21* (-1.71)	-0.81*** (-2.62)
V/C ratio		1.01*** (3.01)	0.88 (1.20)		1.06*** (2.88)	1.21 (1.55)
VC backing		-0.38*** (-2.95)	0.01 (0.05)		-0.43*** (-3.03)	-0.05 (-0.17)
Leverage	1.28*** (7.05)	0.73*** (3.86)	0.04 (0.10)	1.07*** (4.92)	0.78*** (3.60)	0.46 (1.08)
Market momentum	0.01*** (3.78)	0.00 (0.54)	-0.01 (-0.83)	0.01*** (2.94)	-0.00 (-0.22)	-0.00 (-0.26)
Constant	0.27 (0.41)	-4.22*** (-5.77)	-1.67 (-0.91)	-0.76 (-1.14)	-6.15*** (-6.99)	-1.00 (-0.47)
Wald Chi-squared		1,184.7			1,228.3	
No. IPOs		3,704			2,867	
No. direct acquisitions		5,733			3,861	
Total observations		9,437			6,728	

<i>Panel B</i>	Main markets			Exchange-regulated markets		
	IPO vs. direct acquisition	Acquisition vs. Stand- alone	Delisting vs. Stand- alone	IPO vs. direct acquisition	Acquisition vs. Stand- alone	Delisting vs. Stand- alone
	(7)	(8)	(9)	(10)	(11)	(12)
Sales growth						
Market share	0.07*** (4.74)	-0.04*** (-2.79)	-0.01 (-0.54)	0.35*** (5.48)	-0.00 (-0.08)	-0.01 (-0.61)
Big player	-0.21** (-2.14)	0.23 (1.15)	-0.51 (-0.60)	-0.28** (-2.31)	-0.05 (-0.14)	-1.57 (-1.14)
Private benefits	1.27*** (6.78)	-0.13 (-0.52)	0.96 (1.45)	1.82*** (9.37)	-0.56 (-1.61)	0.14 (0.28)
Sales	0.22*** (8.22)	0.04 (0.78)	-0.13 (-1.44)	-0.03 (-0.93)	0.10 (1.43)	-0.10 (-0.75)
Age	-0.12** (-2.27)	-0.17** (-2.48)	-0.25 (-1.22)	-1.06*** (-14.94)	-0.11 (-0.89)	-0.43** (-2.05)
Underwriter reputation		0.28* (1.75)	-1.09** (-2.06)		1.46** (2.12)	-2.11** (-2.44)
Analyst coverage		0.11*** (3.13)	-0.40* (-1.69)		0.93*** (3.56)	-6.43* (-1.72)
Bid-ask spread		-1.64* (-1.77)	14.27** (2.07)		-4.14** (-2.18)	6.22** (2.12)
Excess return		-0.07 (-1.44)	-0.86* (-1.71)		0.11 (1.31)	-2.28*** (-3.98)
Growth opportunities		3.87*** (7.43)	-4.08* (-1.73)		6.94*** (6.53)	-9.07*** (-3.78)
Misvaluation		-0.96*** (-5.04)	0.07 (0.29)		-1.08*** (-4.30)	0.05 (0.31)
Exch-regulated market						
Family		-0.20* (-1.68)	-0.78* (-1.69)		-0.70*** (-3.05)	-1.18*** (-2.94)
V/C ratio		0.79** (2.02)	1.15 (1.12)		1.51** (2.23)	1.29 (1.21)
VC backing		-0.30* (-1.93)	-0.19 (-0.34)		-0.78*** (-3.13)	0.01 (0.02)
Leverage	1.46*** (5.10)	0.54** (2.18)	0.74 (0.93)	1.15*** (4.40)	1.20*** (3.59)	-0.45 (-0.85)
Market momentum	0.02*** (3.52)	-0.00 (-0.14)	0.01 (0.45)	0.01** (2.43)	0.01 (0.94)	-0.04* (-1.94)
Constant	-4.47*** (-4.20)	-3.01*** (-3.23)	-3.48* (-1.68)	0.51 (0.53)	-8.62*** (-4.78)	5.65 (1.04)
Wald Chi-squared		1,181.4			441.4	
No. IPOs		1,678			2,026	
No. direct acquisitions		5,733			4,249	
Total observations		7,411			6,275	

<i>Panel C</i>	United Kingdom			France			Germany		
	IPO vs. direct acquisition	Acquisition vs. Stand- alone	Delisting vs. Stand- alone	IPO vs. direct acquisition	Acquisition vs. Stand- alone	Delisting vs. Stand- alone	IPO vs. direct acquisition	Acquisition vs. Stand- alone	Delisting vs. Stand- alone
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Market share	0.10*** (4.86)	-0.08** (-2.47)	-0.22 (-1.01)	0.12** (2.17)	-0.04* (-1.78)	-0.00 (-0.21)	0.05** (2.40)	-0.04 (-0.75)	-9.02 (-0.56)
Big player	-0.23 (-1.58)	0.50 (1.42)	-0.59 (-0.61)	-0.29* (-1.69)	1.00* (1.86)	-0.15 (-0.13)	-0.46*** (-2.61)	0.13 (0.28)	2.11 (1.38)
Private benefits	1.32*** (6.15)	0.03 (0.06)	-0.37 (-0.50)	1.53*** (6.36)	-0.32 (-0.67)	-0.44 (-0.40)	1.25*** (4.72)	-0.45 (-0.78)	4.59 (1.23)
Sales	0.02 (0.65)	0.09 (1.52)	-0.22* (-1.82)	-0.05 (-1.59)	0.13 (1.43)	-0.17 (-1.03)	-0.01 (-0.16)	0.09 (1.10)	-0.08 (-0.21)
Age	-1.30*** (-16.31)	-0.15 (-1.03)	-0.89*** (-3.28)	0.01 (0.13)	-0.30* (-1.80)	0.02 (0.04)	0.44*** (5.97)	-0.32** (-2.35)	-1.85 (-1.13)
Underwriter reputation		0.29 (0.67)	-0.42 (-0.47)		0.10 (0.19)	-1.21 (-1.36)		0.26 (0.83)	-1.46 (-0.63)
Analyst coverage		0.52*** (2.94)	-3.76* (-1.67)		0.28** (2.56)	-0.28 (-0.44)		0.14** (2.40)	-2.11** (-2.42)
Bid-ask spread		-3.42 (-0.86)	10.95 (1.56)		-4.79 (-1.20)	2.19 (1.22)		-8.53 (-0.81)	9.24 (0.58)
Excess return		-0.19* (-1.96)	-2.81*** (-3.19)		-0.14 (-1.41)	-1.00* (-1.72)		-0.01 (-0.34)	-4.74** (-2.45)
Growth opportunities		13.32*** (7.32)	-27.25*** (-2.91)		1.41* (1.72)	-1.96* (-1.81)		2.66*** (2.84)	-14.67** (-2.42)
Misvaluation		-1.55*** (-5.87)	0.07 (0.22)		-0.89** (-2.40)	-0.17 (-0.72)		-0.32* (-1.68)	1.60 (1.38)
Exch-regulated market		-0.47 (-1.31)	4.00*** (3.20)		-0.28 (-0.79)	1.25* (1.97)		-0.69 (-1.17)	15.71*** (4.71)
Family		0.01 (0.04)	-2.30*** (-3.63)		-0.49* (-1.72)	0.10 (0.17)		-0.21 (-0.73)	-3.67 (-1.48)
V/C ratio		1.25* (1.76)	-1.94 (-0.78)		0.38 (0.37)	2.40 (1.47)		2.22** (2.16)	0.08 (0.26)
VC backing		-0.59** (-2.20)	-1.00* (-1.68)		-0.98*** (-3.28)	-0.16 (-0.28)		-0.51* (-1.76)	-1.29* (-2.02)
Leverage	0.75*** (2.73)	0.63* (1.68)	-1.00 (-1.06)	1.09** (2.15)	0.83* (1.69)	-0.49 (-0.48)	0.86*** (2.70)	0.83 (1.42)	7.25 (1.14)
Market momentum	0.02*** (3.31)	0.03 (1.48)	-0.02 (-0.79)	0.01** (2.46)	-0.00 (-0.04)	0.01 (0.39)	0.02** (2.55)	0.01 (1.06)	-0.14 (-1.53)
Constant	0.36 (0.33)	-7.71*** (-4.56)	-3.66 (-0.88)	-0.58 (-0.78)	-3.71* (-1.88)	23.93 (1.58)	16.41*** (10.45)	-3.61** (-2.33)	-27.19*** (-4.38)
Wald Chi-squared		435.1			134.3			186.5	
No. IPOs		1,894			673			1,137	
No. direct acquisitions		2,904			628			2,201	
Total observations		4,798			1,301			3,338	

Table 4. Valuation and valuation premium (discount) associated with each exit scenario. The table shows the valuations obtained by firms in each step of the dynamic exit process, and the valuation premia (discounts) received with respect to valuations obtained by firms in alternative exit scenarios. Valuation is measured as the enterprise value to sales ratio (EV/Sales), where enterprise value is: implied by the takeover price for direct acquisitions; implied by the offer price for IPOs; implied by the post-IPO takeover price for post-IPO acquisitions; measured two months prior to the delisting date for delisted firms. Valuation premium (or discount, if negative) is defined as the logarithm of the ratio between the EV/Sales of a firm going through a given exit outcome (e.g., IPO) and a comparable firm going through an alternative exit outcome (e.g., Direct acquisition), found using propensity score matching. Valuation premia with respect to IPOs are calculated using the same firm's EV/Sales at the time of the IPO (implied by the offer price) at the denominator. Tests are on the difference in means (t-test) and medians (Wilcoxon-Mann-Whitney test) from zero. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

<i>Panel A. First step (IPO vs. direct acquisition)</i>	<i>average</i>	<i>median</i>
Valuation of Direct acquisitions	1.9	1.0
Valuation of IPOs	3.0	1.8
Valuation premium IPO vs. Direct acquisition (%)	20.6***	22.4***
<i>Panel B. Second step (post-IPO scenarios)</i>		
Valuation of Post-IPO acquisitions	3.3	1.8
Valuation of Stand-alone firms	2.5	1.2
Valuation of Delisted firms	1.8	0.8
Valuation premium of Post-IPO acquisitions (%)		
over IPOs	25.6***	19.1***
over Direct acquisitions	42.5***	37.7***
Valuation discount of delisted firms (%)		
over IPOs	-55.7***	-63.1***
over Direct acquisitions	-40.9***	-33.8***

Table 5. Valuation premia of IPO over direct acquisition valuations. Univariate and multivariate analyses of the determinants of the valuation premia received by IPO firms over the valuation received by firms going through a direct acquisition. Valuation premium is the logarithm of the ratio between the EV/Sales implied by the firm's offer price (for IPOs) and the EV/Sales implied by the takeover price (for direct acquisitions) of the comparable private firm. For each IPO firm, the comparable direct acquisition firm is found using propensity score matching. The left-hand side of the table reports the mean and median (in brackets) values of valuation premium of IPOs over direct acquisitions by splitting the sample of IPOs with above and below median values of the variables reported in rows. Tests are on the difference in means (t-test) and medians (Wilcoxon-Mann-Whitney test) between the two subsamples. The right-hand side of the table shows the estimates of the two-step Heckman selection model on valuation premium of IPOs over direct acquisitions. In the first step, the dependent variable equals 1 in case the firm chooses an IPO as initial exit mechanism, and 0 in case of a direct acquisition; in the second step, the dependent variable is the valuation premium of IPO firms over direct acquisitions. Country, year, and industry fixed effects are included. Heteroskedasticity corrected clustered robust t-statistics are in brackets. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.

	Univariate analysis			Heckman selection model		
	Below median	Above median	Difference above-below	First step	Valuation premium	
					(1)	(2)
Sales growth	13.5 (11.9)	27.2 (27.5)	13.7*** (15.6***)			0.02*** (4.06)
Market share	28.9 (28.3)	12.3 (12.1)	-16.6*** (-16.2***)	0.08*** (5.23)	0.01*** (3.59)	0.01*** (3.90)
Big player	21.1 (23.4)	17.2 (16.7)	-3.9* (-6.7*)	-0.24*** (-2.75)	0.01 (0.29)	0.00 (0.12)
Private benefits				1.31*** (9.84)		
Sales	31.2 (29.6)	10.0 (7.7)	-21.2*** (-21.9***)	0.01 (0.33)	-0.08*** (-11.61)	-0.07*** (-9.27)
Age	23.2 (26.3)	18.0 (15.9)	-5.2** (-10.4**)	-0.48*** (-11.73)	-0.00 (-0.26)	-0.00 (-0.28)
Underwriter reputation	20.1 (22.3)	24.0 (24.2)	3.9** (1.9**)		0.07** (2.17)	0.06** (2.02)
Analyst coverage	22.0 (22.7)	20.6 (22.6)	-1.4 (-0.1)		-0.00 (-0.27)	-0.00 (-0.27)
Exchange-regulated market	21.4 (21.5)	19.5 (23.2)	-1.9 (1.7)		-0.05 (-1.35)	-0.05 (-1.16)
Family	18.8 (22.5)	22.4 (22.5)	3.6* (0.0)		0.02 (1.06)	0.02 (0.93)
VC backing	19.3 (20.6)	22.9 (25.5)	3.6 (4.9**)		-0.01 (-0.32)	-0.01 (-0.54)
Leverage	25.5 (26.3)	15.7 (15.9)	-9.8*** (-10.4**)	1.28*** (7.05)	0.07 (1.64)	0.07 (1.55)
Market momentum	16.7 (21.3)	24.5 (24.6)	7.8*** (-3.3***)	0.01*** (3.78)	0.01*** (4.24)	0.01*** (3.91)
Inverse Mills ratio					0.08 (0.96)	0.09 (1.02)
Constant				0.27 (0.41)	1.23*** (5.73)	1.06*** (4.59)
Pseudo R2 (%) / Wald Chi2				20.4	362.9	332.4
Observations				9,437	3,704	2,867

Table 6. Valuation premia of post-IPO acquisition over IPO valuations. Univariate and multivariate analyses of the determinants of the valuation premia received by 540 firms acquired post-IPO with disclosed valuation (post-IPO acquisitions) with respect to their previous IPO valuations. Valuation premium is the logarithm of the ratio between the EV/Sales implied by the firm's post-IPO takeover price and the EV/Sales implied by the same firm's offer price at the IPO. The left-hand side of the table reports the mean and median (in brackets) values of valuation premium of post-IPO acquisitions over IPOs, by splitting the sample with above and below median values of the variables reported in rows. Tests are on the difference in means (t-test) and medians (Wilcoxon-Mann-Whitney test) between the two subsamples. The right-hand side of the table shows the estimates of the two-step Heckman selection model on the valuation premium of post-IPO acquisitions over IPOs. In the first step, the dependent variable equals 1 if the firm is acquired post-IPO, and 0 otherwise; in the second step, the dependent variable is the valuation premium obtained in post-IPO acquisitions. Country, year, and industry fixed effects are included. Heteroskedasticity corrected clustered robust t-statistics are in brackets. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.

	Univariate analysis			Heckman selection model		
	Below median	Above median	Difference above-below	First step	Valuation premium	
					(1)	(2)
Sales growth	18.7 (18.3)	36.8 (25.1)	18.1** (6.8**)			0.04** (2.11)
Market share	18.8 (15.0)	32.8 (23.3)	14.0* (8.3)	-0.01** (-2.15)	-0.01 (-1.21)	-0.01 (-1.30)
Big player	28.4 (21.9)	12.0 (4.2)	-16.4 (-17.7*)	0.03 (0.35)	-0.10 (-0.75)	-0.19 (-1.21)
Private benefits	25.7 (18.0)	24.8 (29.0)	-0.9 (11.0)	-0.11 (-1.12)	0.08 (0.51)	0.16 (0.90)
Sales	16.5 (14.4)	34.7 (23.2)	18.2** (-8.8*)	0.02** (2.02)	0.02 (1.24)	0.03 (1.15)
Age	20.2 (15.0)	30.9 (21.9)	10.7 (6.9)	-0.11*** (-3.19)	-0.03 (-0.47)	0.04 (0.67)
Underwriter reputation	20.4 (16.6)	51.1 (48.5)	30.7*** (31.9**)	0.16* (1.78)	0.24* (1.76)	0.18 (1.31)
Analyst coverage	21.8 (19.5)	29.1 (18.2)	7.3 (-1.3)	0.05*** (2.64)	0.15*** (5.21)	0.17*** (4.40)
Bid-ask spread	34.9 (27.0)	15.6 (12.1)	-19.3** (-14.9**)	-2.33*** (-3.41)	-5.74*** (-3.96)	-4.18** (-2.25)
Excess return				-0.02 (-0.77)		
Growth opportunities	13.9 (7.4)	37.3 (27.2)	23.4*** (19.8***)	2.66*** (13.08)	1.88* (1.70)	1.84* (1.78)
Misvaluation	23.5 (15.4)	28.2 (24.4)	4.7 (9.0)	-0.47*** (-10.76)	-0.13 (-0.63)	-0.14 (-0.62)
Exchange-regulated market	33.6 (23.3)	13.6 (12.6)	-20.0** (-10.7*)	-0.05 (-0.66)	0.11 (0.97)	0.04 (0.29)
Family	20.5 (13.6)	32.1 (31.8)	11.6 (18.2)	-0.15** (-2.17)	0.16* (1.73)	0.09 (0.95)
V/C ratio				0.54*** (2.78)		
VC backing	21.9 (16.9)	33.6 (26.2)	11.7 (9.3)	-0.23*** (-3.31)	-0.03 (-0.26)	-0.01 (-0.07)
Leverage	20.1 (16.2)	31.2 (22.2)	11.1* (6.0)	0.45*** (4.31)	0.42** (1.98)	0.44 (1.64)
Market momentum	26.5 (21.7)	25.2 (14.9)	-1.3 (-6.8)	0.00 (0.39)	-0.01 (-1.27)	-0.00 (-0.53)
Inverse Mills ratio					1.02* (1.72)	0.71 (1.24)
Constant				-1.91*** (-6.96)	-1.48 (-1.39)	-2.06 (-1.57)
Pseudo R2 (%) / Wald Chi2				22.3	127.8	97.2
Observations				3,704	611	452

Table 7. Valuation premia of post-IPO acquisition over direct acquisition valuations. Univariate and multivariate analyses of the determinants of the valuation premia received by 540 firms acquired post-IPO with disclosed valuation (post-IPO acquisitions) with respect to the valuation obtained by firms directly acquired as private (direct acquisition). Valuation premium is the log of the ratio between the EV/Sales implied by the firm's post-IPO takeover price (post-IPO acquisition) and the EV/Sales implied by the takeover price of the firm directly acquired as private (direct acquisition). For each post-IPO acquisition firm, the comparable direct acquisition firm is found using propensity score matching. The left-hand side of the table reports the mean and median (in brackets) values of valuation premium of post-IPO acquisitions over direct acquisitions, by splitting the sample with above and below median values of the variables reported in rows. Tests are on the difference in means (t-test) and medians (Wilcoxon-Mann-Whitney test) between the two subsamples. The right-hand side of the table shows the estimates of the two-step Heckman selection model on valuation premium of post-IPO acquisitions. In the first step, the dependent variable equals 1 if the firm is acquired post-IPO, and 0 otherwise; in the second step, the dependent variable is the valuation premium obtained in post-IPO acquisitions. Country, year, and industry fixed effects are included. Heteroskedasticity corrected clustered robust t-statistics are in brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels respectively.

	Univariate analysis			Heckman selection model		
	Below median	Above median	Difference above-below	First step	Valuation premium	
					(1)	(2)
Sales growth	25.6 (22.0)	59.4 (56.9)	33.8*** (34.9**)			0.07*** (3.87)
Market share	41.9 (41.6)	43.1 (31.4)	1.2 (-10.2**)	-0.01** (-2.15)	-0.01 (-0.81)	-0.01 (-0.48)
Big player	45.7 (42.0)	26.8 (16.8)	-18.9 (-25.2*)	0.03 (0.35)	-0.08 (-0.64)	-0.20 (-1.36)
Private benefits	41.7 (36.2)	49.0 (56.6)	7.3 (20.4)	-0.11 (-1.12)	0.22 (1.32)	0.26 (1.44)
Sales	42.3 (49.6)	42.7 (30.0)	0.4 (-19.6)	0.02** (2.02)	0.01 (0.40)	-0.01 (-0.40)
Age	38.3 (34.1)	46.6 (41.6)	8.3 (7.5)	-0.11*** (-3.19)	0.02 (0.41)	0.09 (1.50)
Underwriter reputation	36.8 (34.1)	70.2 (59.7)	33.4*** (25.6**)	0.16* (1.78)	0.18 (1.47)	0.16 (1.18)
Analyst coverage	40.2 (34.0)	44.9 (40.4)	4.7 (6.4)	0.05*** (2.64)	0.12*** (4.08)	0.13*** (3.95)
Bid-ask spread	53.8 (42.3)	31.2 (33.1)	-22.6** (-9.2*)	-0.02 (-0.77)	-5.04*** (-3.30)	-5.33*** (-3.64)
Excess return				-2.33*** (-3.41)		
Growth opportunities	27.2 (21.7)	56.2 (51.4)	29.0*** (29.7**)	2.66*** (13.08)	1.11 (0.97)	1.18 (1.18)
Misvaluation	32.7 (30.4)	52.6 (49.1)	19.9** (18.7**)	-0.47*** (-10.76)	0.11 (0.53)	0.09 (0.45)
Exchange-regulated market	53.7 (47.4)	25.7 (25.8)	-28.0*** (-21.6**)	-0.05 (-0.66)	0.05 (0.46)	0.05 (0.37)
Family	35.0 (34.3)	52.2 (49.2)	17.2* (14.9*)	-0.15** (-2.17)	0.24** (2.54)	0.22** (2.19)
V/C ratio				0.54*** (2.78)		
VC backing	40.2 (37.3)	47.5 (39.9)	7.3 (2.6)	-0.23*** (-3.31)	0.03 (0.26)	0.03 (0.22)
Leverage	41.2 (43.4)	44.3 (31.9)	3.1 (-11.5)	0.45*** (4.31)	0.30 (1.37)	0.39* (1.70)
Market momentum	40.0 (34.4)	45.4 (41.5)	5.4 (7.1)	0.00 (0.39)	-0.00 (-0.20)	0.00 (0.22)
Inverse Mills ratio					0.13 (0.23)	0.11 (0.20)
Constant				-1.91*** (-6.96)	-0.38 (-0.34)	-0.55 (-0.47)
Pseudo R2 (%) / Wald Chi2				19.6	137.4	147.9
Observations				3,704	611	452

Table 8. Valuation discounts of delisted firms with respect to IPO valuations. Univariate and multivariate analyses of the determinants of the valuation discounts received by 140 firms that are delisted post-IPO with respect to their previous IPO valuations. Valuation discount is the log of the ratio between the EV/Sales implied by the firm's stock price two months prior to the delisting date, and the EV/Sales implied by the same firm's offer price at the IPO. The left-hand side of the table reports the mean and median (in brackets) values of valuation discount of delisted firms over IPOs, by splitting the sample with above and below median values of the variables reported in rows. Tests are on the difference in means (t-test) and medians (Wilcoxon-Mann-Whitney test) between the two subsamples. The right-hand side of the table shows the estimates of the two-step Heckman selection model on valuation discount of delisted firms with respect to IPOs. In the first step, the dependent variable equals 1 in case the firm is delisted post-IPO, and 0 otherwise; in the second step, the dependent variable is the valuation discount. Country, year, and industry fixed effects are included. Heteroskedasticity corrected clustered robust t-statistics are in brackets. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.

	Univariate analysis			Heckman selection model		
	Below median	Above median	Difference above-below	First step	Valuation discount	
					(1)	(2)
Sales growth	-33.3 (-30.5)	-79.5 (-63.3)	-46.2 (-32.8)			-0.21* (-2.04)
Market share	-100.8 (-76.9)	-10.6 (-31.4)	90.2*** (45.5***)	-0.01 (-0.62)	0.03 (0.18)	0.09 (0.50)
Big player	-49.1 (-63.0)	-137.1 (-61.4)	-88.0* (1.6)	-0.36 (-1.49)	-1.14 (-1.02)	-0.90 (-0.73)
Private benefits	-60.2 (-54.4)	17.3 (-44.1)	77.5.0 (11.6)	0.10 (0.53)	1.79** (2.14)	1.56* (1.96)
Sales	-107.3 (-83.5)	-4.0 (7.4)	103.3** (90.9***)	0.02 (1.09)	0.09* (1.71)	0.14*** (2.88)
Age	-55.6 (-66.0)	-55.7 (-44.5)	-0.1 (21.5)	-0.09 (-1.28)	0.33 (0.97)	-0.16 (-0.39)
Underwriter reputation	-64.7 (-49.5)	21.4 (-9.0)	86.1** (40.5**)	-0.46** (-2.20)	2.10* (1.86)	2.99*** (2.85)
Analyst coverage	-84.9 (-69.0)	8.4 (-3.9)	93.3** (65.1*)	-0.43*** (-3.80)	0.02 (0.04)	-0.21 (-0.36)
Bid-ask spread	-17.8 (-38.5)	-93.6 (-72.7)	-75.8* (-34.2**)	1.83*** (3.43)	-7.22** (-2.47)	-7.05*** (-2.62)
Excess return				-0.53*** (-3.71)		
Growth opportunities	-40.7 (-54.2)	-70.7 (-55.2)	-30.0 (-1.0)	-2.78*** (-5.76)	-5.49 (-1.59)	-3.56 (-1.06)
Misvaluation	-50.2 (-60.4)	-61.2 (-49.7)	-11.0 (10.7)	0.03 (0.47)	-0.35 (-1.27)	-0.43* (-1.72)
Exchange-regulated market	-19.4 (-10.5)	-76.3 (-75.5)	-56.9 (-65.0*)	0.56*** (3.28)	0.82 (0.49)	1.05 (0.64)
Family	-41.3 (-61.4)	-75.2 (-62.0)	-33.9 (-0.6)	-0.33** (-2.40)	-1.12** (-2.18)	-1.18** (-2.35)
V/C ratio				0.30 (0.73)		
VC backing	-75.9 (-66.4)	-64.2 (-62.1)	11.7 (4.3)	0.15 (1.11)	0.18 (0.31)	-0.15 (-0.25)
Leverage	-105.7 (-82.9)	-5.7 (-27.3)	100.0*** (55.6***)	-0.13 (-0.61)	2.80*** (2.99)	3.05*** (3.49)
Market momentum	-52.0 (-60.4)	-59.4 (-50.0)	-7.4 (10.4)	-0.00 (-0.27)	0.03 (0.87)	0.00 (0.12)
Inverse Mills ratio					0.51 (0.38)	0.42 (0.36)
Constant				-1.82*** (-3.04)	-8.42*** (-2.63)	-7.63** (-2.45)
Pseudo R2 (%) / Wald Chi2				19.6	116.0	127.2
Observations				3,704	152	112

Table 9. Valuation discounts of delisted firms with respect to direct acquisition valuations. Univariate and multivariate analyses of the determinants of the valuation discounts received by 140 firms delisted post-IPO with respect to firms directly acquired as private (direct acquisitions). Valuation discount is the log of the ratio between the EV/Sales implied by the firm's stock price two months prior to delisting date, and the EV/Sales implied by the takeover price of the firm acquired as private (direct acquisition). For each delisted firm, the comparable direct acquisition firm is found using propensity score matching. The left-hand side of the table reports mean and median (in brackets) values of valuation discount of delisted firms with respect to direct acquisitions, by splitting the sample with above and below median values of the variables reported in rows. Tests are on the difference in means (t-test) and medians (Wilcoxon-Mann-Whitney test). The right-hand side of the table shows the estimates of the two-step Heckman selection model on valuation discount of delisted firms with respect to direct acquisitions. In the first step, the dependent variable equals 1 in case the firm is delisted post-IPO, and 0 otherwise; in the second step, the dependent variable is the valuation discount. Country, year, and industry fixed effects are included. Heteroskedasticity corrected clustered robust t-statistics are in brackets. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.

	Univariate analysis			Heckman selection model		
	Below median	Above median	Difference above-below	First step	Valuation discount	
					(1)	(2)
Sales growth	-30.9 (-33.3)	-64.3 (-48.7)	-33.4 (-15.4)			-0.27** (-2.45)
Market share	-104.4 (-46.9)	22.6 (-4.9)	127.0** (42.0*)	-0.01 (-0.62)	0.08 (0.42)	0.11 (0.62)
Big player	-37.0 (-33.2)	-89.0 (-34.3)	-52.0* (-1.1)	-0.36 (-1.49)	-1.12 (-0.99)	-0.74 (-0.61)
Private benefits	-45.8 (-38.2)	19.1 (-16.8)	64.9 (21.4)	0.10 (0.53)	1.64* (1.95)	1.44* (1.83)
Sales	-73.3 (-44.5)	-8.5 (6.7)	64.8* (51.2**)	0.02 (1.09)	0.09* (1.70)	0.12** (2.19)
Age	-41.0 (-42.1)	-40.8 (-33.3)	0.2 (8.8)	-0.09 (-1.28)	0.33 (0.94)	-0.22 (-0.54)
Underwriter reputation	-45.9 (-48.7)	2.6 (-20.7)	48.5*** (28.0**)	-0.46** (-2.20)	1.78* (1.77)	2.28** (2.24)
Analyst coverage	-53.6 (-43.3)	-13.0 (-26.4)	40.6** (16.9**)	-0.43*** (-3.80)	0.06 (0.09)	-0.23 (-0.40)
Bid-ask spread	0.2 (-23.7)	-82.0 (-68.3)	-82.2* (-44.6**)	1.83*** (3.43)	-7.79*** (-2.66)	-7.42*** (-2.81)
Excess return				-0.53*** (-3.71)		
Growth opportunities	-24.0 (-36.0)	-57.8 (-33.8)	-33.8 (2.2)	-2.78*** (-5.76)	-4.38 (-1.30)	-2.86 (-0.88)
Misvaluation	-41.6 (-33.2)	-40.2 (-37.7)	1.4 (-4.5)	0.03 (0.47)	-0.40 (-1.44)	-0.45* (-1.77)
Exchange-regulated market	-18.7 (-4.4)	-53.5 (-50.3)	-34.8 (-45.9**)	0.56*** (3.28)	2.47** (2.12)	1.85 (1.51)
Family	-13.6 (-27.5)	-77.8 (-66.4)	-64.2 (-38.9)	-0.33** (-2.40)	-1.24** (-2.42)	-1.25** (-2.51)
V/C ratio				0.30 (0.73)		
VC backing	-60.8 (-51.9)	-42.8 (-34.4)	18.0 (17.5)	0.15 (1.11)	-0.11 (-0.19)	-0.33 (-0.56)
Leverage	-93.5 (-52.8)	11.7 (-1.0)	105.2*** (51.8**)	-0.13 (-0.61)	3.10*** (3.37)	3.12*** (3.57)
Market momentum	-43.0 (-43.3)	-38.8 (-27.1)	4.2 (16.2)	-0.00 (-0.27)	0.03 (0.82)	-0.00 (-0.00)
Inverse Mills ratio					0.45 (0.33)	0.38 (0.33)
Constant				-1.82*** (-3.04)	-10.02*** (-3.33)	-8.19*** (-2.70)
Pseudo R2 (%) / Wald Chi2				19.6	173.4	214.1
Observations				3,704	152	112

Table 10. Valuation premia of post-IPO acquisitions: VC vs. non-VC backed firms. Heckman procedures on the determinants of the valuation premia received by 540 firms acquired post-IPO with disclosed valuation (post-IPO acquisitions) with respect to the valuation received by firms directly acquired as private (direct acquisitions). Valuation premium is the log of the ratio between the EV/Sales implied by the firm's post-IPO takeover price (post-IPO acquisition) and the EV/Sales implied by the takeover price of the comparable private target (direct acquisition). For each post-IPO acquisition firm, the comparable direct acquisition firm is found using propensity score matching. The sample is split based on the presence of a VC among the firm's pre-IPO shareholders. Country, year, and industry fixed effects are included. Heteroskedasticity corrected clustered robust t-statistics are in brackets. ***, **, and * indicate significance at the 1, 5, and 10% levels respectively.

	VC backed firms			Non-VC backed firms		
	First step	Valuation premium		First step	Valuation premium	
		(1)	(2)		(1)	(2)
Sales growth			0.07** (2.17)			0.07*** (3.03)
Market share	-0.01* (-1.77)	0.01 (0.50)	0.02 (0.73)	-0.01 (-1.26)	-0.00 (-0.16)	-0.00 (-0.03)
Big player	0.02 (0.18)	-0.53* (-1.85)	-0.83* (-1.91)	0.18 (1.31)	0.14 (0.86)	0.12 (0.64)
Private benefits	-0.09 (-0.79)	0.59* (1.75)	0.83* (1.82)	-0.12 (-0.76)	0.20 (1.04)	0.17 (0.81)
Sales	0.02 (1.60)	0.01 (0.58)	-0.06 (-0.86)	0.00 (0.29)	-0.00 (-0.33)	-0.00 (-0.15)
Age	-0.07* (-1.94)	0.03 (0.16)	0.08 (0.63)	-0.17*** (-3.36)	0.04 (0.67)	0.10 (1.45)
Underwriter reputation	-0.02 (-0.18)	-0.12 (-0.34)	-0.48 (-0.91)	0.34** (2.51)	0.28* (1.84)	0.22 (1.32)
Analyst coverage	0.06** (2.57)	0.13** (2.41)	0.11* (1.69)	0.05** (2.06)	0.10** (2.09)	0.13** (2.21)
Bid-ask spread	-2.43*** (-3.18)	-4.91** (-2.45)	-5.19** (-2.56)	-2.00* (-1.87)	-5.20*** (-3.02)	-4.84*** (-2.76)
Excess return	-0.02 (-0.65)			-0.02 (-0.44)		
Growth opportunities	2.53*** (11.20)	0.90 (0.34)	-1.18 (-0.37)	2.55*** (8.36)	0.03 (0.02)	0.47 (0.42)
Misvaluation	-0.39*** (-8.36)	0.44 (0.54)	1.10 (1.03)	-0.77*** (-8.79)	0.22 (1.09)	0.12 (0.62)
Exchange-regulated market	-0.04 (-0.46)	-0.05 (-0.25)	-0.04 (-0.16)	-0.06 (-0.48)	0.10 (0.67)	0.03 (0.18)
Family	-0.06 (-0.78)	0.22* (1.77)	0.39* (1.91)	-0.31*** (-3.01)	0.28** (2.26)	0.30** (2.40)
V/C ratio	0.57*** (2.68)			0.33 (1.07)		
Leverage	0.54*** (4.69)	0.28 (0.70)	0.46 (0.97)	0.35** (2.17)	0.23 (0.75)	0.26 (0.87)
Market momentum	0.00 (0.52)	-0.02* (-2.00)	-0.02 (-1.58)	0.00 (0.21)	0.01* (1.72)	0.01 (1.45)
Inverse Mills ratio		-0.21 (-0.34)	-0.08 (-0.14)		-0.45 (-0.35)	-1.39 (-0.89)
Constant	-2.33*** (-7.75)	0.19 (0.07)	3.41 (0.82)	-1.86*** (-4.41)	0.46 (0.32)	-0.26 (-0.17)
Pseudo R2 (%) / Wald Chi2	15.9	94.3	70.8	23.3	106.2	102.9
Observations	3274	181	130	3523	430	322

Table 11. Alternative benchmark: valuation premia of post-IPO acquisitions and valuation discounts of delisted firms with respect to stand-alone firm valuations. Heckman procedures on the determinants of valuation premia received by 540 firms acquired post-IPO with disclosed valuation (post-IPO acquisitions) and valuation discounts received by 140 firms delisted post-IPO. For post-IPO acquisitions, valuation premium is the log of the ratio between the EV/Sales implied by the firm's post-IPO takeover price (post-IPO acquisition) and the EV/Sales of the comparable stand-alone firm at the day of the acquisition. For delisted firms, valuation discount is the log of the ratio between the EV/Sales of the firm two months prior to delisting and the EV/Sales of the comparable stand-alone firm at the same date. For each post-IPO acquisition and delisted firm, the comparable stand-alone firm is found using propensity score matching. In the first step of the left-hand (right-hand) side, the dependent variable equals 1 if the firm is acquired (delisted) post-IPO, and 0 otherwise; in the second step, the dependent variable is the valuation premium (discount). Country, year, and industry fixed effects are included. Heteroskedasticity corrected clustered robust t-statistics are in brackets. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.

	Post-IPO acquisitions vs. Stand-alone			Delisted firms vs. Stand-alone		
	First step	Valuation premium		First step	Valuation premium	
		(1)	(2)		(1)	(2)
Sales growth			0.12*** (3.59)			-0.09 (-1.41)
Market share	-0.01** (-2.15)	-0.00 (-0.05)	0.01 (0.40)	-0.01 (-0.62)	-0.13 (-1.29)	-0.10 (-1.00)
Big player	0.03 (0.35)	0.18 (0.76)	0.14 (0.53)	-0.36 (-1.49)	0.40 (0.65)	-0.16 (-0.22)
Private benefits	-0.11 (-1.12)	0.38 (1.23)	0.52 (1.61)	0.10 (0.53)	0.55 (1.20)	0.67 (1.42)
Sales	0.02** (2.02)	-0.06* (-1.70)	-0.08** (-2.23)	0.02 (1.09)	-0.03 (-1.22)	-0.01 (-0.50)
Age	-0.11*** (-3.19)	-0.04 (-0.36)	-0.03 (-0.31)	-0.09 (-1.28)	0.34* (1.78)	0.37 (1.52)
Underwriter reputation	0.16* (1.78)	-0.26 (-1.16)	-0.24 (-0.98)	-0.46** (-2.20)	1.31** (2.24)	1.54** (2.57)
Analyst coverage	0.05*** (2.64)	-0.01 (-0.22)	-0.01 (-0.14)	-0.43*** (-3.80)	-0.28 (-0.75)	-0.33 (-0.94)
Bid-ask spread	-0.02 (-0.77)	-7.61*** (-2.79)	-8.50*** (-3.29)	1.83*** (3.43)	-5.84*** (-3.64)	-5.22*** (-3.27)
Excess return	-2.33*** (-3.41)			-0.53*** (-3.71)		
Growth opportunities	2.66*** (13.08)	-0.76 (-0.37)	-0.90 (-0.51)	-2.78*** (-5.76)	-0.73 (-0.40)	-0.49 (-0.25)
Misvaluation	-0.47*** (-10.76)	0.21 (0.54)	0.28 (0.80)	0.03 (0.47)	-0.26* (-1.71)	-0.28* (-1.80)
Exchange-regulated market	-0.05 (-0.66)	0.30 (1.34)	0.29 (1.22)	0.56*** (3.28)	0.44 (0.69)	0.67 (0.91)
Family	-0.15** (-2.17)	-0.08 (-0.45)	-0.16 (-0.89)	-0.33** (-2.40)	-0.58** (-2.06)	-0.70** (-2.33)
V/C ratio	0.54*** (2.78)			0.30 (0.73)		
VC backing	-0.23*** (-3.31)	0.63** (2.57)	0.65** (2.50)	0.15 (1.11)	0.55* (1.80)	0.49 (1.40)
Leverage	0.45*** (4.31)	-0.12 (-0.29)	-0.18 (-0.42)	-0.13 (-0.61)	0.56 (1.11)	0.80 (1.52)
Market momentum	0.00 (0.39)	-0.00 (-0.45)	-0.00 (-0.16)	-0.00 (-0.27)	0.02 (0.79)	0.01 (0.56)
Inverse Mills ratio		-0.39 (-0.38)	-0.53 (-0.57)		-0.34 (-0.45)	-0.31 (-0.43)
Constant	-1.91*** (-6.96)	2.33 (1.17)	2.78 (1.35)	-1.82*** (-3.04)	-5.05*** (-3.07)	-5.64*** (-3.09)
Pseudo R2 (%) / Wald Chi2	22.3	68.6	94.8	19.6	184.4	182.8
Observations	3,704	611	452	3,704	152	112

Table 12. Alternative time horizons: two years and one year since IPO. Sequential logistic regression analysis of the 3,433 IPO firms' likelihood of going through each of the post-IPO scenarios, and Heckman procedure on valuation premia received by 540 firms acquired post-IPO with disclosed valuation (post-IPO acquisitions) with respect to the valuation obtained by firms directly acquired as private (direct acquisitions). The time horizon used to determine the post-IPO scenarios is 1 year (left-hand side) and 2 years (right-hand side) since IPO. In the sequential logit regression (only the second step is shown), the dependent variable is categorical and identifies the three possible post-IPO scenarios (acquisition, stand-alone, delisting, with stand-alone being the base outcome) among firms that previously decided to go public. In the Heckman selection model, the dependent variable is the valuation premium of post-IPO acquisitions over direct acquisitions. Country, year, and industry fixed effects are included. Heteroskedasticity corrected clustered robust z-statistics (t-statistics in Heckman's model) are in brackets. ***, **, and * represent statistical significance at the 1, 5, and 10 percent levels, respectively.

	One year since IPO			Two years since IPO		
	Sequential logit post-IPO scenarios		Heckman's second step	Sequential logit post-IPO scenarios		Heckman's second step
	Post-IPO acq. vs. stand-alone	Delisting vs. stand-alone	Valuation premium	Post-IPO acq. vs. stand-alone	Delisting vs. stand-alone	Valuation premium
Sales growth	0.16*** (3.28)	-1.09 (-1.18)	0.07** (2.15)	0.19*** (4.95)	-0.06 (-0.54)	0.07*** (3.58)
Market share	-0.03** (-2.14)	-8.00 (-1.17)	0.07 (1.63)	-0.06*** (-3.13)	-0.01 (-0.54)	0.04 (1.08)
Big player	0.06 (0.18)	-4.73* (-1.83)	-0.27 (-1.01)	0.45** (2.12)	-0.43 (-0.41)	-0.10 (-0.57)
Private benefits	0.01 (0.02)	0.05 (0.06)	0.03 (0.10)	-0.42 (-1.47)	0.27 (0.42)	0.37 (1.54)
Sales	0.13* (1.91)	-0.56 (-1.01)	0.00 (0.05)	0.09* (1.80)	-0.21 (-1.15)	-0.01 (-0.40)
Age	-0.10 (-0.77)	-0.62 (-0.97)	0.02 (0.26)	-0.11 (-1.08)	-0.11 (-0.32)	0.06 (0.95)
Underwriter reputation	0.23 (0.83)	-3.39** (-2.49)	0.17 (0.75)	0.14 (0.63)	0.14 (0.13)	0.10 (0.68)
Analyst coverage	0.16*** (3.12)	-5.11*** (-5.97)	0.14*** (3.68)	0.19*** (3.43)	-3.57** (-2.19)	0.11*** (3.06)
Excess return	0.00 (0.15)	-0.03 (-0.11)		-0.00 (-0.28)	-0.52 (-1.15)	
Bid-ask spread	-6.30* (-1.93)	8.02** (2.12)	-0.45 (-0.15)	-3.34** (-2.05)	4.12*** (2.79)	-4.35*** (-2.67)
Growth opportunities	3.46*** (4.39)	-5.44* (-1.88)	0.22 (0.20)	4.50*** (7.44)	-7.80** (-2.51)	0.44 (0.34)
Misvaluation	-0.53** (-2.10)	-0.11 (-0.58)	0.24 (1.30)	-0.63*** (-3.77)	0.17 (0.59)	0.14 (0.76)
Exch-regulated market	-0.60 (-1.15)	-0.23 (-0.09)	0.03 (0.11)	0.43* (1.80)	0.56 (0.88)	-0.02 (-0.12)
Family	-0.45* (-1.77)	-0.57 (-0.42)	0.58*** (2.76)	-0.31* (-1.85)	-0.55* (-1.71)	0.21* (1.76)
V/C ratio	1.32** (2.17)	-1.82 (-0.66)		0.85* (1.90)	0.68 (0.56)	
VC backing	-0.00 (-0.02)	-0.67 (-0.99)	-0.15 (-0.76)	-0.24 (-1.48)	-0.13 (-0.28)	0.05 (0.35)
Leverage	0.64* (1.71)	1.52 (0.76)	0.35 (1.14)	1.04*** (4.34)	0.43 (0.59)	0.28 (0.90)
Market momentum	-0.02 (-1.53)	0.06 (1.54)	0.00 (0.22)	-0.01 (-1.48)	0.00 (0.08)	-0.00 (-0.72)
Constant	-10.01*** (-6.71)	22.27** (2.31)	0.86 (0.46)	-7.60*** (-7.33)	2.37 (0.59)	0.02 (0.01)
Wald Chi-squared	352.3		105.5	352.3		120.2
No. IPOs	2,867		-	2,867		-
No. direct acquisitions	3,861		-	3,861		-
Total observations	6,728		145	6,728		374