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‘Ultimate Survival: Private Equity Buy & Build Strategies’

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Ultimate Survival: Private Equity Buy & Build Strategies

A parametric survival analysis of the complexity of buy and build strategies and their corresponding type of exit

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Abstract

This thesis aims to examine the impact of the complexity of the buy-and-build strategy on the duration and the type of exit. The thesis differentiates in the way complexity is determined by the nature of the B&B strategy, making a distinction between cross-border and domestic strategies, industry penetrating and diversifying strategies, the number off add-ons and the distance between the platform firm and the add-ons. Furthermore, country specific factors are included. These factors relate to the GDP per capita, country investment attractiveness, institutional quality, and differences in cultural values. Additionally, exit market conditions, such as the number of IPO and M&A transactions are taken into account. The sample comprises worldwide B&B strategy acquisitions made by platform firms located in Europe between 1997 and 2019. In order to examine the effect of the complexity of the B&B strategy on the duration and the corresponding exit type, a parametric accelerated failure time analysis is used. The results indicate that the proposed measures of complexity are very relevant for the duration of the B&B strategy and the subsequent exit.

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Preface and acknowledgements

One year ago, I had to determine the subject of my master thesis. At that point I was intrigued by the buy and build strategy of private equity firms, while reading academic papers. Since this subject was relatively new and related research was scarce, I expected it to be interesting to delve into this very recent and popular strategy. Particularly the observed trends in terms of duration and complexity seemed interesting. The process turned out to be incredibly fascinating. I refrained from using common OLS statistics and tried out something I had never done before. Survival analyses bring about so much more interesting results. The process was extensive and sometimes frustrating, but eventually I learned a lot from it. I hope my research can be seen as a starting point for future research relating to the complexity of private equity strategies. I am really proud of what I have written in the past few months, and credits go to the people around me for supporting me throughout the process. Especially, my supervisor Dr. Vadym Volosovych, who granted me complete independence in writing, while providing guidance whenever I needed it.

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Abbreviations and key terms

Add-on	The firm that is acquired by the platform firm Another word for add-on: follow-on
AFT	Accelerated failure time
AIC	Akaike information criterion
B&B	Buy-and-build strategy
CIF	Cumulative incidence function
CR	Competing risk
Duration	The time between the initial buyout of the platform firm by the private equity firm and the subsequent exit of the strategy
GP	General partner
IPO	Initial public offering
IRR	Internal rate of return
LBO	Leveraged buyout
LL	Log-logistic
Lock up period	Predetermined amount of time where large shareholders are not allowed to sell their shares subsequent to an IPO
LP	Limited partner
LR	Likelihood ratio test
M&A	Mergers and acquisitions
PE	Private equity firm
PH	Proportional hazard
Platform firm	The firm that is acquired by the private equity firm that serves as a platform for the acquisitions in the B&B strategy
SBO	Secondary buyout

Introduction

The market for private equity can almost be tracked back to the beginning of the 20th century and has come in waves since then. The first wave is characterized by financial engineering, followed by a wave exhibiting operational engineering, up until the current wave. At the moment the private equity market is mature. Specifically, within the market there is an enormous amount of competition for non-proprietary sourced deals, difficulties in finding proprietary deals, and extreme performance pressure on capital that has already been implemented. The increased competition for a smaller pool of higher-class assets, and higher multiples as a result, pressures private equity investors to be more inventive in isolating profitable opportunities.

One recent and increasingly popular method concerns the use of inorganic growth strategies, or a so-called buy-and-build strategy, in which a number of firms are added together into an efficient large-scale network through industry consolidation or a form of a serial acquisition strategy (Bansraj & Smit, 2017). Besides the growing popularity and more frequent use of the strategy, another trend is observed. Specifically, the average duration of private equity investments has increased dramatically over the last decade. This increased duration brings about several consequences. One of the consequences relates to private equity firms continuously needing to raise new funds to finance their investments. The duration of the investments can be related to the capabilities of a private equity firm, as short holding periods are likely to indicate that investment return targets were met, whereas extended durations could imply inferior capabilities of the private equity firm.

Yet, the inorganic growth strategies pursued by the private equity firms are very distinct. Some strategies involve acquisitions that are industry diversifying and domestic, while others are industry penetrating and cross-border. Another potential reason for dissimilar strategies is the number of add-ons that are acquired through the B&B strategy. These differences in the nature of the strategies should imply a different type of complexity. More complex strategies will likely result in an extended holding period compared to simpler types of strategies. Considering the relevance of the duration of the strategy, it is likely that the complexity would be an important determinant. Additionally, considering that the investors collect their investment at the exit of the strategy, and the exit is an essential part of the investment, it suggests that more complex strategies will be rewarded by exiting via higher paying exit-types, to compensate for the extended duration due to an increased complexity.

The existing literature however is scarce on the complexity of the B&B strategy, the related duration and exit types. Hammer (2018) presents a unique approach for determining complexity, by differentiating between inorganic growth strategies with a different nature. Nonetheless, the approach is too broad and disregards the effect of for example a relatively higher number of add-ons on the strategy complexity, as he only differentiates between single or multiple add-on B&B strategies. This provides an interesting topic for research relating to the B&B strategy, in terms of improved measures of complexity.

This thesis aims to provide these enhanced measures of complexity, and the corresponding impact of complexity on the duration of the B&B strategy and the subsequent exit type. By including additional measures such as the number of add-ons, the distance between the platform firm and the add-on firm, and country specific measures, this thesis intents to answer the following question:

Is the complexity of the buy-and-build strategy a determining factor for the holding period and the corresponding type of exit?

In order to answer this question a sample is constructed by manually collecting data on the B&B strategy that was pursued by private equity-backed European platform firms between 1997 and 2019. The dataset comprised 1,197 unique strategies that acquire a total of 2,368 worldwide add-ons, of which 489 strategies experienced an exit via an IPO, trade sale, financial buyout, or a dissolution. In order to incorporate the information borne by strategies that have not experienced an exit in the sample, a parametric accelerated failure time analysis is used.

The results of the survival analysis indicate the relevance of the additional measures of complexity. The number of add-ons and the distance between the platform firm and add-ons indicate a significant prolonging effect on the duration of the B&B strategy. Interestingly, strategies that pursue a strategy that is relatively more complex tend to accelerate the time to exit. Likewise, measures for country specific factors and exit market conditions prove to be highly relevant.

The results of this thesis contribute to the existing literature by verifying the determinants of the duration of the B&B strategy, through the inclusion of additional measures of complexity.

The remainder of this thesis is structured as follows: Chapter 1 provides a literature review regarding the existing rationale on the complexity of the B&B strategy, the impact on the duration, and the corresponding exit. In chapter 2 the data collection process is presented. Additionally, an extensive section is written on the survival analysis that is required to answer the research question. Chapter 3 discusses the results of the data analyses. Furthermore, the robustness of the results will be tested. In chapter 4 a review of the research is presented, next to limitations of this thesis and fruitful future research topics.

1. Literature review

In this section I will provide a comprehensive literature review regarding the current knowledge of the buy-and-build strategy, which is one of the most common strategies being adopted by private equity (or hereafter 'PE') firms nowadays. Furthermore, I will develop my hypotheses that will be tested in this research based on previous empirical and theoretical findings.

1.1 The buy-and-build strategy

Private equity firms are adopting the buy-and-build strategy (or hereafter 'B&B') more and more often, and it has almost become a standard strategy for PE firms. The Boston Consulting Group[1] observed an increase from 20% in 2000 to 53% in 2012 in terms of private equity deals that included add-on acquisitions, which perfectly coincides with the title of an article by The Wall Street Journal stating "*The glory days of private equity are over: too many funds are chasing too few opportunities, and many of those will be too expensive. It won't end well*" [2]. Academic literature and industry reports concur with the suggestion of the article. Braun, Jenkinson, & Stoff (2017) claim that traditional value creation levers more and more commoditize and have come under pressure.[3] Sharp competition for deals, rising valuations, and volatile returns are the result of the growing merger and acquisition (or hereafter 'M&A') markets and more capital commitments to private equity by institutional investors. Private equity firms are forced to seek new ways to achieve the same or higher return on investment and started to make use of M&A practices, and holding companies for extended periods, through a buy-and-build strategy. Surveys by PWC[4] and BCG[5] demonstrate that these procedures are the single most important way to improve operations in PE buyouts.

Smit (2001) is one of the first to mention and elaborate on the buy-and-build strategy; an inorganic growth strategy in which a number of firms are added together into an efficient large-scale network through industry consolidation or a form of a serial acquisition strategy (Bansraj & Smit, 2017).This hybrid strategy, between serial acquisition strategies of strategic and financial players, aims to combine the financial synergies of leveraged buyouts (or hereafter 'LBOs') in private equity with the long-term synergy focus of strategic buyers. Smit (2001) indicates that the prevailing literature does not present satisfactory guidance and theory on the interaction of serial LBOs and exit opportunities, the consolidation game that is played by the private equity fund in the industry, and how deals are depending on financing. Despite the market for serial acquisitions accounting for about 30% of the total private equity deal activity in Europe (Bansraj, Smit, & Volosovych, 2019), and surveys indicating the

[1] The power of buy and build: How private equity firms fuel next-level value creation., BCG February 2016 (link).
[2] The Wall Street Journal, March 29, 2015 (link).
[3] Leverage reduction (Axelson, Jenkinson, Strömberg, & Weisbach, 2013), operational improvements (Guo, Hotchkiss, & Song, 2011), and improved governance (Cumming, Siegel, & Wright, 2007).
[4] Pushing further in search of return: The new private equity model., PWC August 2015 (link).
[5] The power of buy and build: How private equity firms fuel next-level value creation., BCG February 2016 (link).

frequent use and popularity of the B&B strategy, empirical literature examining this new trend is rare (Hammer, Hinrichs, & Schweizer, 2016). Furthermore, it is important to mention that the extensive strand of literature on serial acquisition strategies of public entities cannot be translated one-off to private equity serial acquisition strategies (Jensen, 1986; 1989).[6]

Next to the growing popularity and frequent use of the buy-and-build strategy, another trend is visible in the private equity industry. Specifically, the holding periods of private equity investments have been increasing noticeably over the years. Hammer (2016) shows an increase of 60% in the average holding period of all the 2012 exits compared to the 2003 exits, or from 3.3 tot 5.3 years. Research by a company called Preqin points at an increase in the average holding period for European deals from 4.5 to 6.2 years, for deals exited between 2004 and 2006 compared to deals exited in 2014.[7] Worth mentioning, 36% of the portfolios exited in 2014 were under PE control for over 7 years, whereas that percentage was about 15% in the period 2006-2009.[8] Bansraj et al. (2019) also confirm the focus on a longer time horizon in buy-and-build strategies, with an average holding period of over five years, which is longer than the horizon for a typical LBO. Furthermore, they indicate that strategies that take at least five years to exit, are particularly effective in growing sales and improving the profitability of the entire portfolio.

Hammer (2016) examines the potential disadvantages of the buy-and-build strategy and posits that the longer holding period is a concern for both the general partners (or hereafter 'GPs') and limited partners (or hereafter 'LPs'). The reason for this is that it is more challenging to deliver a satisfactory Internal Rate of Return (or hereafter 'IRR'), and the longer periods increase the illiquidity of the committed capital. Extended periods potentially also have an unfavourable effect on future fundraising, it is presumed that a short holding period is valuable for investment returns and hence fundraising undertakings (Loos & Schwetzler, 2017). Valkama, Maula, Nikoskelainen, & Wright (2013) show a correlation of -0.44 between the IRR and the holding period. This adverse effect on the return is important. The GPs and LPs collect the return on their investment usually at the end of the investment period, after exit, and are not given any compensation in the form of dividends for example throughout the holding period. This puts pressure on the holding period, and management is inclined to exit the investment strategy once targets have been met. Furthermore, this holding period also shows the capabilities of the private equity firm, in which a shorter holding period might indicate that targets were achieved early and the fund can be put elsewhere. Phalippou & Gottschalg (2009) state that GPs usually try to obtain new investment funds every two to five years. With extended holding periods it might be

[6] Reasons for serial acquisitions with respect to public entities include, among others, empire building (Kim, Haleblian, & Finkelstein, 2011); (Aktas, De Bodt, & Roll, 2013); (Masulis, Wang, & Xie, 2007), learning (Fuller, Netter, & Stegemoller, 2002); (Laamanen & Keil, 2008) and overconfidence ((Malmendier & Tate, 2008); (Billet & Qian, 2008). Empire building is of a lesser problem because private equity brings about strong management incentives and are tied to a limited holding period.

[7] Preqin (2015): Private Equity Spotlight, August 2015 (link).

[8] Additional research on holding periods: Ljungqvist & Richardson (2003) posit an average holding period of 3.6 years; Jenkinson & Sousa (2015) indicate that after four years portfolio companies are exited.

more difficult to raise new capital. Nonetheless, a rather short duration leads to recurring costs for the funds and the LPs investing in them, or the shortened cyclical search for new assets by the GPs according to a report by Bain & Company.[9] This report brings about some advantages of long-hold funds. First of all, a long-hold fund brings lower transaction costs, such as taxes and consultant fees linked to the acquisition and exiting procedure of portfolios. Secondly, there are fewer distractions for portfolio company management. In addition, long-hold funds result in fully invested capital over extended periods with less time between reinvestments. Furthermore, the report points at deferred taxation of capital gains, granting capital to compound over time. Additionally, the long-hold fund provides flexibility on the investment horizon, resulting in assets to be sold at an optimal moment by the funds. The fund also provides access to firms searching for patient capital, such as founder-led businesses that require investments to be able to grow. Additionally, the Bain & Company report provides guidance on how the private equity sector could compete with corporate buyers in M&A, particularly for larger assets. Private equity firms should be acting more like corporations and increase their investment durations. This will extend their time that is available to integrate and transform the follow-on acquisitions. The report furthermore indicates that a longer holding period offers more flexibility for GPs, in terms of time available to keep and develop unique assets, that spend most of their time either raising capital or selling and buying assets.

It is clear that there is a new trend within the private equity sector. PE firms are adopting M&A strategies at a larger scale and there are signs of prolongation of the investment period. The strategies pursued by the private equity firms are however very distinct. Among other factors such as the number of acquisitions, some strategies are cross-border and industry penetrating while others comprise of acquisitions that are domestic but industry diversifying. The nature of these types of strategies should differ in the degree of complexity, irrespective of the experience of the private equity firm. More complex strategies will likely result in longer holding periods compared to the simpler types of strategies. Furthermore, taking into account that the exit is the most important aspect for the investors, as they can retrieve their investment plus additional proceedings, it is reasonable to consider that more complex strategies will be rewarded and exited via distinct channels. Through this rationale, the complexity of the B&B strategy should have an impact on the duration of the investment and the corresponding type of exit. With regard to the arguments made above, the holding period of the investments made by private equity firms are very relevant and it is interesting to clarify the rationale. Additionally, given the briefly described trends in the private equity sector and the characteristics of the buy-and-build strategy this thesis aims at providing a comprehensive answer to the following question:

Is the complexity of the buy-and-build strategy a determining factor for the holding period and the corresponding type of exit?

[9] Spotlight on Long-Hold Funds: Opening Up New Horizons., Bain & Company 2018 (link).

The relevance of and motivation for this research topic will be thoroughly expanded further on in this literature review with several hypotheses.

1.2 Complexity as a determinant of prolongation of the buy-and-build strategy

1.2.1 (Inter)national add-on acquisitions

Given the importance of the holding period of an investment made by a private equity firm using a buy-and-build strategy, it calls for a comprehensive analysis of the factors that drive the holding period, or 'duration' hereafter. As described earlier, a current trend in the private equity sector is the extension of the average holding period, which seems to be at odds with research by Hammer et al. (2016), who claim with importance that private equity firms are incentivized, in order to uphold the IRR of the fund, to exit portfolio firms as soon as possible. In addition to sustaining the IRR, exiting the firm after a brief period is needed to distribute the provided capital back to its fund's investors (Cumming, Flemming, & Schwienbacher, 2006). Thus, there is a holding period constraint and Hammer et al. (2016) state that private equity firms face a trade-off between the quantity and complexity of add-on acquisitions, and they refer to a boost or transformation hypothesis.[10] Furthermore, Hammer (2018) finds that complexity is crucial for the extent to which the buy-and-build strategy amplifies the duration. It is important to mention and remind that as Hammer et al. (2016) bring forward, an essential argument for an increase in the duration through the B&B strategy, and M&A in general, is because of additional transaction costs that come with acquisitions. Likewise, the arguments presented below describe how the transaction costs are affected by the degree of complexity of the B&B strategy, specifically whether the add-ons are a cross-border type of acquisition or of a domestic nature.

Existing literature suggests that industry diversifying and cross-border acquisitions bring relatively large transaction costs and thereby might extend the holding period. The first reason for an increase in transaction costs or whereby the complexity increases is due to monitoring problems. It is more difficult to monitor and provide guidance when the platform firm and add-on are not in close proximity, and potentially delaying the creation of synergies (Kang & Kim, 2008); (Wang & Wang, 2012); (Bernstein, Giroud, & Townsend, 2015). Secondly, Rossi & Volpin (2004), and Erel, Liao, & Weisbach (2012) state that when pursuing cross-border strategies several distinct legal regimes or accounting procedures have to be taken into account when closing the deal. Thirdly, as Ahern, Daminelli, & Fracassi (2015) put forward, following cross-border acquisitions, the integration could be slowed down because of cultural differences between the two firms that bring coordination costs or even lead to a total merger failure.[11] A fourth reason why cross-border acquisitions lead to higher transaction costs is because

10 Boost hypothesis: To increase market power and obtain economies of scale, portfolio firms acquire more but similar firms compared to their peers; Transformation hypothesis: To obtain a competitive advantage over their peers by gaining access to pioneering technologies, services, or markets, through acquisitions at an analogous frequency.

11 The merger between Chrysler and Daimler (1998) failed totally, cultural differences played a significant role (Harvard Business Review; link, link).

information production is more difficult in case the follow-on acquisitions are not located in immediacy of the platform firm (Buch & DeLong, 2004; Malloy, 2005; Butler, 2008; Lau & Yu, 2010). This degree of complexity can thus be present through different levels; the private equity firm versus the platform firm and the add-on firms, but also the platform firm versus the add-on firms. The abovementioned arguments for an increase in costs are related to post-acquisition issues. Incurred costs because of information asymmetries and coordination are very relevant for the duration of the B&B strategy as they relate to the intended return and investment horizon (Hammer, Knauer, Pflücke, & Schwetzler, 2017). For that reason, cross-border or industry diversifying strategies will only be pursued if the marginal costs are relatively small. What is more, private equity firms also incur costs prior to an acquisition. Akerlof (1970) states that there are information asymmetry issues because the add-on firm might be active in an unfamiliar environment. As a result, costs for acquiring information have to be incurred by the private equity firm to evaluate the quality of the target (Servaes & Zenner, 1996; Capron & Chen, 2007). According to Balakrishnan & Koza (1993) and Humphery-Jenner, Sautner, & Suchard (2017) adverse selection tends to be a problem for cross-border acquisitions. The costs for gathering information on the target seem to be large for the PE sector, as portfolio and add-ons firms are likely to be non-listed.

Hammer et al. (2016) are the first to present an analysis on the portfolio firm level, when comparing the cross-border effect of the follow-on acquisitions versus the portfolio firm country of origin with respect to a buy-and-build strategy.[12] In their research cross-border acquisitions are compared via cultural and geographic remoteness, besides differences in accounting quality, political risk, and the degree of appeal of the country in which the private equity company is located.

Through learning gains and the building of experience in different industry and country contexts, the elaborated effects of the complexity on duration, and the inherent costs due to information asymmetries and coordination costs, however, can be reduced (Very & Schweiger, 2001; Hayward, 2002; Dikova, Sahib, & Witteloostuijn, 2010).

Harding & Rovit (2004) and Lajoux (1998) put forward that the first-order determinant of merger success is the role of integration. They refer to integration costs related to geographic distance, complexity of the firms, and industry relatedness, with the degree of teamwork and coordination by the employees of the acquirer and target firm being the determining factor. Ahern et al. (2015) suggest that in case of the vital role of employee teamwork, the diversities in the cultural values of the employees tend to shape their ability to jointly work efficient. What follows is the assumption that non-cross-border acquisition strategies, or cultural similarities, will create fewer transactions costs and thereby reduce the required holding period, in addition to fewer monitoring difficulties. Hammer et al. (2016) were the first to evaluate cross-border acquisitions where the platform and add-on acquisitions were in

[12] Earlier literature gave an analysis on the fund level, in terms of cross-border effects of follow-on acquisitions, for example Cao, Cumming, Qian, & Wang (2015), and Espenlaub, Khurshed, & Mohamed (2012).

different countries at the private equity portfolio firm level. One reason this was meaningful to investigate, was because the lion's share of research only evaluates cross-border acquisitions on a fund level, whereas the platform firm is required to integrate the acquired company with the accompanying transaction costs. What is striking, is that firms are willing to pay a premium for cross-border acquisitions, even though the transaction costs related to the integration of the firms will be higher, compared to domestic acquisition strategies. Hammer et al. (2016) posit that these types of strategies are costlier to replicate, and thus firms are willing to choose for a cross-border acquisition.

However, the costs associated with cross-border acquisitions can be reduced effectively through firm-level acquisition experience (Very & Schweiger, 2001; Hayward, 2002; Aktas, De Bodt, & Roll, 2013). Collins, Holcomb, Certo, Hitt, & Lester (2009) indicate that attained cross-border acquisition experience not only draws upon organizational learning but could also provide information on a particular industry or country. As a result, the firm incurs fewer costs for information gathering, and possibly allocates fewer resources to the monitoring and management of the merging process. It is even assumed that the obtained experience for cross-border deals creates a higher probability for subsequent cross-border deals and a lower risk of adverse selection. Hammer et al. (2017) suggest that the cross-border experience drives down the opportunity costs for private equity firms. Overall, the cross-border acquisition experience will reduce transaction costs, and thereby favours return goals to be achieved earlier, or a shorter holding period. Additionally, with respect to operating performance, Hammer et al. (2016) find that cross-border B&B strategies are a relevant tool for outperformance, and have a positive effect on performance overall.

To summarize the reasons for larger transaction costs because of cross-border acquisitions:
i) information production is more difficult, ii) uncommon legal regimes and accounting standards, iii) coordination of cultural differences, iv) struggles with monitoring and directing operations.

1.2.2 Add-on acquisition industry relatedness

Firms are targeted by platform companies that are active in the same industry to either widen or deepen their exposure in a particular industry and to generate profits through multiple expansion and developed synergies (Smit, 2001). Although the reasons for larger transaction costs for industry diversifying versus industry penetrating are relatively similar to the reasons set out for cross-border acquisitions, it is important to treat them separately in order to keep the complexity measures transparent and distinctive.

Servaes & Zenner (1996) claim that B&B strategies that are industry diversifying might amplify the duration because of information asymmetries that result from unrelated acquisitions. Humphery-Jenner (2013) adds that industry diversifying acquisitions require increased management attention and more resource allocation. Hammer et al. (2016) suggest that industry-penetrating acquisitions, and therefore likely within the company's core business activities, present a less complex strategy. The main reason for the reduced amount of complexity is because industry knowledge has already been acquired, and there is less need for information production. As Hammer et al. (2016) state, determining a definite separation between diversifying and penetrating strategies is not clear-cut, this research will dive deeper into the individual influence of the industry relatedness on the complexity of the B&B strategy. This seems interesting, and possibly augmented by the cross-border strategy complexity, as some acquisitions might be domestic and industry diversifying or penetrating, others might be cross-border and penetrating.[13] Hammer (2016) notes there is evidence for an extended B&B strategy duration in case of industry diversifying acquisitions, although compared to penetration strategies the differences are relatively small. The suggestion follows that private equity companies are capable of managing more complex industry diversifying strategies, and almost independent of the nature of the strategy in terms of industry relatedness, the B&B strategy on the whole leads to higher transaction costs and thereby a longer holding period. Another interesting finding by Bansraj et al. (2019) relates to the creation of synergies, knowledge spillovers, and higher integration efficiency, in case the add-on acquisition concerns a close supplier or customer of the platform firm. The acquisition of a close supplier tends to increase the sales growth and strategy profitability, besides its positive effect on labour productivity.

1.2.3 Number of add-on acquisitions

Hammer (2018) gives two suggestive reasons why the duration increases when firms are following a B&B strategy. The buy-and-build strategy comprises serial acquisitions, add-ons, that result in time-consuming processes for the portfolio firms. These add-ons need to be integrated into the standing organizational structure and this process brings costs besides common practices such as negotiations with vendors and banks, due diligence, and the communication with lawyers, advisors or institutional bodies. However, Cao et al. (2015) posit that the experience and sophistication of the PE owner tend to decrease these costs but will never lead to zero transaction costs. Logically, as private equity investors mainly benefit from multiple expansion at portfolio exit, these activities need to be finalized prior to the exit, extending the duration compared to deals that do not follow a B&B strategy. Hammer (2018) further recalls the ‘limited attention hypothesis’ of Cumming & Dai (2011), which states that the duration is affected because add-on acquisitions create opportunity costs. Because the acquisitions processes are time-consuming, they may distract the attention from other value enhancing procedures. What is more, the portfolio firm is likely to grow in size and complexity by integrating add-ons, making it harder for management to overlook and monitor all the activities, this slows down the growth in value and the realization of synergies. Cumming & Johan (2010) indicate that because of these monitoring

[13] A key contribution of this thesis is the development of a complexity index that is more comprehensive than the very scarce, or even present, literature on buy-and-build strategy complexity. This complexity measurement will be elaborated thoroughly in the next chapter, data and methodology.

constraints the owners of the portfolio firm are seduced to retain the company longer to realize the full value creation potential.

Hammer (2018) looks into factors driving the extension of the holding period and uses a novel index with three indicators for add-on complexity. Specifically, he considers the i) number of add-ons, ii) whether the acquisitions are cross-border or not, and finally, iii) if the B&B strategy is industry penetrating or diversifying. Hammer's (2018) results indicate that the number of add-on acquisitions has a significant explanatory power for longer holding periods; cross-border and industry relatedness are also of importance. His results further show that following a B&B strategy extends the holding period by at least 13% and at the most 20%. Besides, Hammer (2016) looks at an 'unintended' dark side of B&B strategies, an illiquidity feature that is created because committed capital is tied up for a longer period, given the arguments for an increase in the duration. Another important reason for an increase in the duration lies with an information asymmetry problem at the portfolio exit. Hammer (2016) puts forward that opportunistic behaviour could lead to follow-on acquisitions instead of being the result of procedures with an economic rationale. With this argument Hammer (2016) refers to PE firms having an incentive to make use of follow-on acquisitions for 'ageing assets' in order to create a full-of-potential looking equity story to prospective buyers. And by denoting research of, among others, Cumming & Johan (2010), Hammer (2016) states that private equity firms, in order to lessen agency costs and signal economic value to forthcoming buyers, are incentivized to remain invested in the portfolio company for a while post exit.

To summarize existing literature on duration determinants there are four main reasons why the holding period could increase when using a B&B strategy and a higher number of add-on acquisitions: i) transaction costs, ii) time to realize economies of scale and efficiency improvements, iii) opportunity costs, iv) an information asymmetry issue between buyer and seller.

It seems likely that more time between the separate add-ons provides additional room for management to monitor the existing operations and reduces the limited attention hypothesis, therefore it is assumed that strategies with multiple add-ons, though with a non-rushed implementation period will have a decreased duration compared to strategies with the same amount of add-ons, but a rather simultaneous implementation, controlled for relative firm size of course. Furthermore, when controlling for size, it is expected that as firms become larger relative to the follow-on firm through the integration of preceding add-ons, the time needed for the merging process will be a decreasing function of the number of total add-ons, because of experience gained through the integration of add-ons. Hence, the total number of add-ons will have a prolonging effect on the total holding period overall, but it might depict a decreasing effect on the total duration of the B&B strategy with a higher number of add-ons.

To the best of my knowledge all buy-and-build strategy related research that has been done, considers the number of add-on acquisitions and takes the amount as given for the effect on the holding period, thereby differentiating only between single or multiple add-on strategies. Hammer (2018) presents a unique index for the complexity of the buy-and-build strategy with regard to the characteristics of add-ons, but also this index leads to an overall influence of the number of add-ons on the duration. The results of the prevailing research therefore seem too broad and call for a thorough investigation on the individual influence of the add-ons on the portfolio company holding period.

1.3 Complexity as a determinant of the buy-and-build strategy exit opportunities

The type of exit following the successful B&B strategy is an important aspect of the whole private equity investment cycle. Exiting an investment strategy goes along two dimensions, the type of exit and the timing of exit (Giot & Schwienbacher, 2007). Both dimensions will be elaborated below.

Schmidt, Steffen, & Szabo (2010) put forward that exiting the B&B strategy enables the realization of returns. Before expounding the literature on the buy-and-build strategy and the preferred choice of exit, it is essential to set out whether there is a natural ranking or pecking-order with respect to exit choices in general in the private equity sector. There are evidently different types of exit channels, but mainly IPOs, Sales, and Write-offs according to Schmidt et al. (2010). Ample literature has looked into the preferred exit choice for private equity firms and the main finding is that private equity firms choose for Initial Public Offerings (or hereafter 'IPOs') as they offer the highest return potential (Nikoskelainen & Wright, 2007; Cao & Lerner, 2009). Another appealing type of exit is through Financial Buyouts, they present a quicker exit-process than IPOs, and bring about less transaction costs and higher certain earnings. IPOs have the advantage of bringing high returns, but these are uncertain. Besides, IPOs incur high transaction costs and lock-up periods that hinder the full exit of the private equity firm (Cao J. , 2011).[14]

Other studies determine a different pecking order, not in terms of exit-proceeds but rather in commonality, such as the study by Kaplan & Strömberg (2009) which indicated that in a sample of 17,171 worldwide leveraged buyouts, the most common type of exit is via the sale of the portfolio firm to strategic buyers.[15] The second most common exit is via a secondary buyout. Whereas exiting via IPOs has become less popular or common. Secondary buyouts are considered to be a last-resort, Bonini (2015) indicates that fruitful investments are more likely to be exited via trade sales or IPOs. Hammer et al. (2017) show that add-on acquisitions during the B&B strategy encourages exiting via IPOs, whereas in case there is still remaining growth potential the likely exit will be via financial buyouts.[16]

[14] Lock-up period: '*A lock-up period is a window of time when investors in a hedge fund or another closely held investment vehicle are not allowed to redeem or sell shares. The lock-up period helps portfolio managers avoid liquidity problems while capital is put to work in sometimes illiquid investments. The initial public offering (IPO) lock-up is a typical lock-up period in the equities market used for newly issued public shares. It typically lasts anywhere from 90 to 180 days after the first day of trading so that fund managers can keep a lower amount of cash on hand.'* (Investopedia, accessed at 24-07-19, link).
[15] Between 1970 and 2007 (between 1970 – 1984: IPOs 28%; in 2007: IPOs 1%), in the study of Kaplan & Strömberg (2009).
[16] In the sample of Hammer et al. (2017) of the exited 5,093 buyouts, 47% was trade sales, 7% was IPO, 36% was financial buyout and 10% defaulted.

As indicated earlier, the scarce, though present research into buy-and-build strategies looked mainly into the exit choice likelihood of private equity firms following the strategy, independent of the individual add-on impact, thus indicating a too broad view. The rationale for a secondary buyout is to exploit the unused inorganic growth potential of the portfolio firms. This means the industry fragmentation is still high enough for another private equity firm to continue the industry consolidation. Another reason why the preferred exit is via a buyout is because of the opportunity to exit safely, efficiently and quickly by selling the portfolio company, according to Jenkinson & Sousa (2015).[17]

Experience is also a determining factor for the choice of exit, as it is found that firms with relatively more experience (experience of GPs) tend to exit via a trade sale rather than via an SBO. Another interesting finding by Gompers (1996), also by Jenkinson & Sousa (2015), is that PE firms that lack a good reputation because they are young, are likely to opt for an IPO as exit channel. Through this IPO they tend to create a reputation, making them more capable of raising capital for future funds.

Following Schwienbacher (2002), firms exhibiting abundant growth potential, a compelling equity story, and being a substantially profitable company, are likely to exit via IPOs. Schmidt et al. (2010) suggest therefore, that strategies that are in a more advanced or mature stage are less likely to exit via Initial Public Offerings. The third type of exit explained by Schmidt et al. (2010) is via a Write-off, in which underperforming strategies are written off. Possibly to reduce the failure ratio of the portfolio, and its adverse impact on reputation and performance.

Various strands of literature indicate that market conditions (debt and equity) tend to be the determining factor for the preferred choice of exit-strategy (Cao, 2011; Wang, 2012; Jenkinson & Sousa, 2015). When equity markets are not favourable, and debt markets seem to prove a good alternative, with attractive credit circumstances, firms are more likely to exit via an SBO, and vice versa. Considering that the proceeds through the secondary buyout will generate a more certain return.

Interesting as it is, portfolio firms opt to exit via an IPO, even though the portfolio firm’s long-term performance might be impaired in case of satisfactory equity market conditions (Lerner, 1994; Cao, 2011; Jenkinson and Sousa, 2015). Literature showed that rather favourable stock market valuations usually depict windows of opportunities for Initial Public Offerings as the common type of exit, as to the costs of external equity to potential acquirers are lowered (Schleifer & Vishny, 2003). This suggests that in case of overvalued stock markets, private equity firms make use of the situation and thereby sooner exits are expected, and hence a shorter duration.

Schmidt et al. (2010) state that there appears to be a relation between the holding period and the exit-types, beforementioned. According to Cumming & MacIntosh (2002) value can be added only over time. Their findings are defended by the arguments of Cao & Lerner (2009), who showed that ‘quick flips’, or investments that are exited within one year, underperformed the market. Notwithstanding,

[17] The sample used by Jenkinson & Sousa includes only exits via IPOs, SBOs and trade sales with a transaction value exceeding 50 million dollar.

investments outperformed the market in case of holding periods shorter than the median duration as opposed to extended holding periods. Furthermore, Cumming & MacIntosh (2002) put forward that the investment holding period is a signal for the company's quality. Private equity firms are sophisticated and are able to set apart superior and inferior types of investments, and thereby will add value only to promising investment opportunities. Consequently, it seemed that strategies with an extended duration would likely exit via IPOs, since they are considered to be highflyers, with a promising equity story and growth opportunities. Nevertheless, their results couldn't back their suggested correlation, unlike their evidence for the relation between duration and write-offs, referred to as the signalling effect. Strategies with shorter holding periods were likely to be exited via write-offs. These results supported the ability of PE firms to differentiate between good and bad deals and abandon portfolio firms with an inferior quality.

Another reason for write-offs as exit type occurring in strategies with a relatively short duration, could potentially be caused by unfavourable information that became apparent post-acquisition. Private equity firms will abandon so called 'living-dead' investments, in this way only well-performing investments remain in the private equity firm's portfolio, in addition it possibly enhances future fundraising opportunities.[18]

Smit (2001) posits that the B&B strategy will likely result in a growth in firm size with more attractive exit opportunities, since expectations of continued growth are created. Hammer et al. (2017) confirm that for B&B strategies with add-on acquisitions it is more likely exiting the strategy via an IPO since the size of the platform firm will become larger through the integration of the additional companies.[19] Pagano, Panetta, & Zingales (1998) and Brau & Kohers (2003) indicate that for larger firms, and size is an important determinant, it is easier to stand the large fixed costs that are incurred during an IPO. Furthermore, they are more visible and draw more attention from investors and analysts. Besides the foregoing viewpoints, B&B strategies that have a prolonged duration tend to have made use of market consolidation and offer fewer unexploited inorganic growth opportunities for future potential buyers, making a financial buyout less likely.

The information below will briefly describe the advantages, disadvantages, and drivers of the different exit types:

IPO

The main advantage of exiting a strategy via an IPO is because of the reward and high valuation at exit. Although the exit is only partial, because of the lock-up period, the IPO option provides increased liquidity, since the remaining shares can be sold easily subsequent to the exit because there is a market for these securities. Furthermore, the process of exiting the B&B strategy via an IPO is slow and the

[18] 'Living dead' investments: Preserving underperforming investments, rather than writing off underperforming investments in the private equity firm's portfolio.

[19] Studying a sample of 9,548 buyouts, it is more likely to exit via an IPO since the integration of add-on firms enlarges the portfolio firm and it is thereby more suitable to withstand the high fixed costs that are incurred for an IPO exit.

costs are high, due to underwriter fees, legal fees, registration costs etc. Firm size is an important factor to permit an IPO exit, since a larger firm is able to sustain the higher costs related to the exit and with a larger firm size investor attention and interest is enhanced (Pagano et al.,1998).

Trade sale

The main advantage of a trade sale exit is the premium paid by a strategic buyer. The strategic buyer will integrate the firm into its line of business in order to achieve synergies. Furthermore, the exit is not partial as is the case with an IPO exit. Therefore, the private equity firm is able to exit fully, without any lock-up period. Another advantage relates to the time needed for the exit process, once both parties agree to the terms, the deal is completed with a relatively short regulatory process. An important disadvantage of this exit type is that it often involves the sale of a relatively larger firm which needs to be approved by the competition board. Therefore, the sale is not certain, and it potentially provides information that can be used by competitors. A possible driver for a trade sale exit corresponds to a higher number of add-ons making it more likely the firm has achieved synergies and economies of scale, and thereby exploited the inorganic growth opportunities.

Financial buyout

The advantages of this exit type relate to the advantages of the trade sale exit, with one important difference. When selling the firm to another financial buyer, the price paid is lower compared to selling the firm to a strategic buyer. The financial buyer does not integrate the firm into its own firm with synergistic goals. The drivers of exiting via a financial buyout relate to unexploited growth opportunities in the market, for instance a lower number of add-ons during the strategy could indicate there are ample inorganic growth opportunities to made use of.

Furthermore, the literature has considered IPOs and trade sales as successful exits, and financial buyouts, or dissolutions, as unsuccessful (Espenlaub et al., 2015). Through an IPO and trade sale the B&B strategy is likely to end, in terms of adding additional firms to the platform, and the rewards received are also the largest.

1.4 Hypotheses development

The foregoing paragraphs presented an overview of the existing literature corresponding to the B&B strategy. The observed most recent trend in the private equity sector indicates that private equity firms are adopting M&A practices at a larger scale compared to the previous decade, besides the noticeable prolongation of the investment period of the B&B strategy. Considering that strategies are different in nature and are not likely to exit in the same way, the following research question was established:

Is the complexity of the buy-and-build strategy a determining factor for the holding period and the corresponding type of exit?

This research question will be assessed by validating two separate sets of hypotheses. The first set of hypotheses relates to the complexity of the strategy. While the second set of hypotheses concerns the B&B strategy exit types. The rationale behind the hypotheses will be described briefly, as the literature review provided a thorough reasoning.

The literature review assessed factors contributing to the degree of complexity of the strategy the private equity firm is pursuing. The first and second important factor concern the nature of the strategy, whether the add-on firms are located within the same country, or are cross-border, and whether the add-on company operates within the same industry as the platform firm, or the strategy is of a diversifying nature. The third imperative factor driving the complexity of the strategy is the number of add-ons that are acquired throughout the strategy. This involves several combinations of complexity that potentially affect the duration of the B&B strategy. By ranking these types of strategies, elaborated in the methodology section, the following is hypothesized:

Hypothesis 1a: A relatively higher degree of complexity prolongs the duration of the B&B strategy.

It is expected that cross-border and industry diversifying acquisitions tend to prolong the duration of the B&B strategy as these types of strategies exhibit a higher degree of complexity, compared to domestic and industry penetrating strategies. The classification of this degree of complexity is set forth in the methodology section.

Hypothesis 1b: A relatively higher number of add-ons prolongs the duration of the B&B strategy.

Besides the evident notion that it is likely that multiple acquisitions require more time to be successfully implemented than single add-on strategies, additional add-on acquisitions are likely to prolong the duration of the B&B strategy through the creation of supplementary transaction costs, such as for example enhanced monitoring and guidance necessities and employee cooperation.

Hypothesis 1c: Strategies that involve relatively more distant acquisitions tend to prolong the duration of the B&B strategy.

More distant strategies are likely to result in longer holding periods due to monitoring and guidance difficulties, whereas it is expected that relatively less distant strategies indicate a reduced holding period. Since countries are not of the same size, it is expected that besides cross-border versus domestic strategies, distance is another driver of the duration of the B&B strategy.

Hypotheses 1d: Strategies that are rushed will likely result in a prolonged duration of the B&B strategy.

It is expected that strategies that are rushed will have a prolonging effect on the duration of the B&B strategy. With less time between the initial acquisition of the platform firm by the private equity company and the subsequent first add-on, or the time between the subsequent add-ons. A potential reason for this prolongation is because of the limited attention hypothesis.

Hypothesis 1e: Country-specific factors of the add-ons are important drivers of the duration of the B&B strategy.

Country-specific factors of the add-ons are expected to have an imperative impact on the duration of the B&B strategy. For example, cultural differences affect the time needed to successfully integrate a company and align goals.

The second set of hypotheses involves the relation between the complexity of the B&B strategy and the corresponding type of exit.

Hypothesis 2a: Relatively more complex strategies tend to exit via an IPO or Trade Sale

It is expected that strategies that involve a relatively higher degree of complexity require a longer duration in order to achieve the synergistic goals of the strategy compared to relatively simpler strategies. The degree of complexity and the prolonged duration will be rewarded by exiting through the highest paying exit type.

Hypothesis 2b: A B&B strategy with a relatively higher number of add-ons is likely to exit via a trade sale or an IPO.

Leaving less room for a second buyer, through a financial buyout, to continue the B&B strategy, it seems more likely that strategies with a higher number of add-ons tend to exit via a trade sale. The acquisition of multiple add-ons results in a larger overall firm size and thereby the firm is able to sustain the larger fixed costs incurred during the process of an IPO.

Hypothesis 2c: The B&B strategy exit is dependent on the exit market conditions.

In case the exit market conditions, determined by the activity in the M&A and IPO market, are favourable, strategies tend to exit via a trade sale or an IPO, rather than via a financial buyout or dissolution.

In the next chapter, Data and Methodology, I will present the sample collection procedure, the sample characteristics, and the applied methodology that is used for the data analyses to verify the established hypotheses.

2. Data and methodology

2.1 Sample selection and data sources

The lack of available private equity related data is a well-known obstacle in the literature. This is augmented especially for research into the B&B strategy as the strategies typically concern, multiple, smaller privately-owned companies. Bansraj et al. (2019) indicate that the reporting requirements (financial and transaction information) for private firms are relaxed in most countries, particularly regarding the requirements for smaller firms. In addition, deal information is intentionally undisclosed because of anti-competitive purposes. Specifically, for sequential acquisitions by the same platform firm, as with the B&B strategy, it creates certain problems.

The B&B strategy involves three kinds of firms, the initial platform firm, add-on firms, and finally the platform firm with all the integrated add-ons. A very powerful database that is often used in research for private equity or M&A research is Zephyr.[20] Using this database, I construct my sample, of buy-and-build strategies and holding periods, in four main steps.

The first part is collected by gathering all deals available with the tag 'Buy & Build', presenting all the serial acquisitions done by platform companies, with the following criteria:

1. Time period: on and after 01/01/1997 and up to and including 04/08/2019 (Completed-confirmed)
2. World regions: Eastern Europe, Western Europe, and Nordic States (Acquirer)
3. Sub-deal type: Buy & Build[21]
4. Deal financing: Private equity
5. Percentage of stake: Percentage of initial stake (max: 50%); Percentage of final stake (min: 50%)

   This results in 4,875 deals, with 2,901 unique acquirers (platform firms), and 4,040 known platform IDs.

The rationale behind these criteria is as follows. Since my research disregards performance measures, I am able to use the most extensive timeframe, since post-exit information is irrelevant. The world regions are chosen because of the database coverage of Zephyr on the European private equity market, and a lack of data availability outside these regions, delivering the opportunity to better compare the results of existing literature on the European market, and finally because these regions include both the most active and less active private equity markets in Europe, instead of only a small number of countries

[20] Zephyr: The database, by Bureau van Dijk, contains information on more than 900,000 deals worldwide dating to 1997. A useful advantage of this database is the presence of the sub-deal type tag 'Buy & Build'. Another advantage of the Zephyr database is its availability of data on the European private equity market. Former research using Zephyr is extensive (Wang, 2012; Jenkinson & Sousa, 2015; Hammer, 2016 and 2018; Hammer et al., 2016 and 2017; Bansraj et al., 2019).

[21] The definition by Zephyr of the sub-deal type 'Buy & Build' or the tag 'Build Up' is as follows: ''*Build Up' would be added as sub deal type when a Private Equity company builds up the company it owns by acquiring other companies to amalgamate into the larger firm, thus increasing the total value of its investments through synergies between the acquired companies'*.

being investigated. Thereby, it creates the possibility for a more comprehensive analysis of cross-border deals and underlying distinctive drivers of complexity. The tag ‘Buy & Build’ is used to isolate only deals that concern a sequential strategy. Lastly, only majority acquisitions are included following Bansraj & Smit (2017). This part of the sample represents the sequential acquisitions that are made between platform firms and add-ons.

The second part of the sample considers the collection of information on the acquisition of the platform firm, being a target in the transaction. Whereas in the first part of the sample collection, the platform firm was considered an acquirer. To construct this part of the sample, the following criteria are used:

1. Deal type: Institutional buy-out, Management buy-in, Management buy-out, MBO/MBI
2. Unique platform BvD IDs of the first part of the sample
3. Current deal status: Completed

This resulted in a data sample of 2,020 deals, however this included more than one date for several platform firms. Therefore, I only considered the first available date prior to the first add-on deal, as the entry date for the B&B strategy. This information was attached to the information of the first step of the sample.

The third part of the sample construction involves finding exit related information. Again, the platform firm is used as a target. As the firms might be acquired several times after the exit date, and as indicated also prior to the B&B strategy, I only consider the first date of acquisition in which the platform is the target, subsequent to the last available add-on acquisition date. Similar to the previous step, the unique platform IDs are used, with the following search criteria:

1. Unique platform BvD IDs of the second part of the sample
2. Current deal status: Completed

With these criteria a sample was created of 8,741 deals. However, this sample also included dates prior to the start or the end of the B&B strategy. It is important to mention that Zephyr provides ‘Deal Numbers’ for the search criteria, whereas other information such as ‘Dates’ and ‘Company IDs’ are not available for a large part of the search results. Subsequently, for every platform firm and its most recent add-on acquisition completion date the according exit date was found. This is done because I consider the whole strategy, from the first until the last add-on, and in-between exit dates are disregarded. Therefore, only the first exit date later than the initial platform acquisition and latest add-on date is considered. Furthermore, it is important to mention that deals of which exit related data, and data for other required variables, is missing, are not dropped out of the sample. Since I also consider liquidations and ongoing B&B strategies, this is imperative for the research. The larger part of the sample, without exit deal information, could also indicate that the strategy is still ongoing, instead of a lack of public information on exit deals. This resulted in exit data for exactly 3,180 deals (exit date > latest add-on date). The next step involved putting all the sample data together, in order to create the largest possible sample for this timeframe. This process comprised matching the available exit data to the existing deal information from step 1 and 2, by considering all types of exit paths, except for exit-deal types involving minority stakes. Notwithstanding, exit-deals that were tagged by Zephyr with an 'Unknown stake' in terms of 'Deal type' but were indicated as '*Exit' through the 'Deal sub-type' tag, were included. As a result, exit information for 1,036 unique platform firms remained.

The resulting sample of step 1, 2, and 3 consisted of 2,901 unique platforms and 4,876 add-ons. The following part of the sampling process involved cleaning the data, leaving only deals with information available on the required variables elaborated in the literature review. In this way, only deals with information present on the industry (indicated by the NACE Rev. 2 codes) the platform and add-on firm are operating in, the corresponding country, and the date of which the platform firm was initially acquired, were included.[22] This process brought about the following information regarding the buy-and-build strategies for the time frame and the indicated criteria: a total of 2,686 deals, 1,490 unique strategies, 2,274 add-ons, and finally exit-related information on 674 unique strategies.

As this study evaluates the duration of the B&B strategy, available exit information was imperative. Via Orbis, another database by Bureau van Dijk, for all the platform companies the 'Status' was retrieved, to verify whether a strategy was still ongoing or was terminated, through a bankruptcy for instance. This was done for deals that completed a buy-and-build acquisition and had no subsequent exit date. For all those still active deals, the exit date was set at 04/08/2019, the date of the data collection for this research. For deals that finished the B&B strategy the accompanying exit information was used.

Finally, in order to work with a trustworthy sample representing the buy-and-build industry, I manually verified all the deals searched for per unique platform-strategy and added missing information on the strategies (particularly missed add-ons per platform-firm and strategy exit dates[23]), via Zephyr and Orbis, and crosschecked all my data on the buy-and-build strategy with the data of my supervisor, Mr. Volosovych. Deals for which Zephyr provided inconsistent or doubtful information, irrespective of the data of my supervisor, regarding deal information (i.e. deal type, deal sub-type, entry date, follow-on date, exit date, exit type) were corrected or dropped.[24] This brought about an extensive process leading to a manually created and very unique dataset, with the characteristics shown on the next page and, in the tables, and figures in Appendix A and B.

22 The acquirer and target BvD IDs were not as relevant as for performance analyses, as this thesis evaluates strategy complexity, instead of strategy performance. However, for some financial variables the IDs were required.

23 A great number of deals indicated a negative relation between the platform acquisition date and the subsequent first add-on date, all these deals were manually checked since Zephyr did not provide usable data, by individually checking the deals in question on the private equity firm's website or other sources such as news articles and press releases. Deals that involved a buy-and-build strategy without a private equity sponsor backing that acquisition by the firm were omitted as this thesis only considers PE backed strategies.

24 The difference in the date of data collection regarding the deals in the dataset of my supervisor and the date of data collection for this thesis is around two years. Deals that were indicated to be active potentially experienced an exit in the time between the dates of data collection.

The whole process resulted in the following number of deals:

Total number of deals	2,368
Known platform-IDs	1,197
Unique strategies	1,197
Unique strategies with known Exits	489
Deals still active	708

The remaining sample comprised exits classified only as Active, IPO, Financial Buyout, Trade Sale, or Dissolved. However, this depicts the total usable sample. Next to creating a sample with the allowed-for B&B strategies, additional information was gathered on several company and national variables needed for complexity determinants, following Hammer et al. (2016). The need for financial information regarding platform firms and B&B strategies limits the size of the sample, this will be discussed further on.[25] A complete list of the variables, and the corresponding sources, used in this research can be found in appendix A: List of dependent and independent variables.

2.2 Sample characteristics

— Insert Table 1 and Figure 1 about here —

In order to interpret and judge the results of the analyses that will be performed of the dataset, it is imperative to understand the data that is beneath the results. Therefore, this section will present a thorough analysis of the characteristics of the sample.

Table 1 shows the number of the platform buyouts by the private equity sponsor and the subsequent add-on acquisitions per year. Additionally, the nature of the strategies is shown as to whether the strategies involve cross-border or domestic acquisitions and whether the add-ons are in the similar industry or the strategy is of an industry diversifying nature. Furthermore, the type of exit is shown per year. The financial crisis starting in 2007, with its peak in 2008 and becoming less devastating in 2009 is a convenient point in my sample to compare the ten years prior to the crisis to the ten years following the crisis.[26] The number of platform acquisitions has almost doubled when comparing the ten years prior to the financial crisis and the ten years post crisis, which shows the growing popularity of the B&B strategy. The total amount of add-on acquisitions is almost nine times larger when comparing the

25 Since this thesis analyses the B&B strategy starting in 1997, historical versions of Orbis have been utilized to preserve the sample size. The current version of Orbis only presents financial information up until ten years in the past, or 2009.

26 The ten years prior to the crisis involve 1997 – 2006, the ten years following the crisis involve 2010 – 2019. Note: The sample only takes into account the deals up until August 2019, the moment of the data collection, meaning 9,5 years post crisis to be specific.

same period. Before the financial crisis 63 percent of the strategies involved domestic add-on acquisitions compared to 72 percent post-crisis. Regarding the industry characteristics, 41 percent of the add-ons prior to the crisis comprised of industry penetrating strategies as to 45 percent involved industry penetrating strategies post-crisis. The whole sample, including the years of the financial crisis, show that 71 percent of the strategies are domestic, and 44 percent are industry penetrating. Besides the nature of the strategy, the exit-types in the sample are also worth mentioning. The most frequent type of exit for both pre- and post-crisis is via a trade sale, 44 and 43 percent respectively. Dissolution was the least frequent type of strategy exit pre-crisis whereas post-crisis, IPOs were the least frequent, 8 and 6 percent respectively. Strikingly, post-crisis the amount of strategies that dissolved accounted for 17 percent of all the exits post crisis, with the greatest amount of dissolutions during the two years following the crisis. Overall, the most popular exits are via a trade sale (44 percent), financial buyout (37 percent), dissolution (12 percent), and IPOs (8 percent) being the least likely type of exit.[27] Furthermore, Figure 1, panel an and b, presents a graphical depiction of the exit-type distribution throughout the whole sample.

— Insert Table 2 about here —

Table 2 presents the sample distribution regarding the type of exits and strategies that are still active. Furthermore, it shows the total average duration per exit-type. The average duration of all the strategies in the sample is 2,532 days or roughly 6.9 years. Dissolved exits involve strategies with the shortest average duration, whereas still active strategies involve the longest average duration of almost 7.5 years. The shortest strategy exited via bankruptcy taking only 267 days, whereas the longest strategy exited via a financial buyout after almost 7,210 days, or almost 20 years, and making a total of only one acquisition.

— Insert Figure 2 about here —

— Insert Table 3 about here —

Another remarkable characteristic of the buy-and-build strategies involves the spreading of the different types of industries in the sample. Table 3 presents the sample distribution along the different types of industries. The manufacturing industry comprises the largest number of platform firms, 333 specifically, or 27.8 percent, as well as the largest number of add-ons. The B&B strategy seems to be the least likely in the industry of Public Administration and Defense, with only two platform firms and five add-on firms. There are also no registered exits in this industry, therefore there is no uncensored

[27] Hammer et al. (2017) have a very similar sample distribution of exit-types: Trade sale (47 percent), financial buyout (36 percent), defaults (10 percent), and IPOs (7 percent).

duration. The strategies with the shortest duration are within the Real Estate Activities industry, whereas the most prolonged strategies are within the Accommodation and Food Service Activities industry, with an uncensored duration of 7.9 years. Figure 2 depicts the industry distribution of the platform and follow-on firms via three dimensions. Based on 4-digit, 2-digit Nace codes, and 10 main industries. The purpose of this figure follows from the suggestion that B&B strategies are used to consolidate the market in order to obtain economies of scale and a stronger market position, this is found for horizontal mergers, or acquisitions within the same industry (Singh & Montgomery, 1987; Bhattacharyya & Nain, 2011). If this is true the dots in the figure would be plotted along the 45-degree line, as this indicates the platform firm and the add-on are in the same industry. However, the figure clearly depicts industry diversification, which indicates that private equity firms are also seeking other goals within the B&B strategy.

— Insert Table 4 and Table 5 about here —

Table 4 presents various meaningful sample insights. First of all, it shows the distribution of the number of add-ons per strategies for the whole sample. Meaning there are 719 strategies that only acquire one add-on, and there is only one strategy that acquires 44 add-ons. The largest part of the sample comprises strategies with only one or two add-ons (81.7 percent), and the average amount of add-ons per strategy is almost two. The information in Table 4 and Table 5 shows that for most strategies three quarters of the add-ons are within the platform firm's country, and roughly half of all the strategies are industry penetrating (horizontal), meaning the add-on operates within platform firm's industry.

The simplest strategies, meaning domestic acquisitions and within the same industry as the platform firm, add up to 782 strategies. Whereas the most complex strategies, cross-border and industry diversifying, add up to 410 strategies.[28]

Table 5 shows a general overview of some sample characteristics. The whole sample comprises 1,197 strategies, or individual platform firms, that make a total of 679 cross-border acquisitions, or 28.7 percent. Of all the add-ons that are acquired only 40% is in the same industry as the platform firm. The strategy with the shortest duration exited after 267 days via a bankruptcy, whereas the strategy with the longest duration exited after almost 20 years via a financial buyout. Another important fact is given by this table. When dividing the total duration of all the strategies with their corresponding number of add-on acquisitions, the average amount it takes for a platform firm to acquire one add-on and exit that strategy is 1,843 days or more than 5 years.

[28] These strategies are only assessed through two dimensions of complexity, country and industry, additional measures of complexity are described in the next section.

— Insert Table 6 about here —

This study only considers platform firms that are within Europe, although the add-on acquisitions made by the platform firms may be located worldwide. Table 6 therefore presents the total number of exits, the number of platforms, and the number of add-ons per region. What is striking, is that more than half of all the strategies in the sample are located within the United Kingdom, the same holds for the number of add-ons, almost 38 percent. What follows is that the largest part of the sample would also exit within the United Kingdom, which is confirmed by the table. Outside the platform countries there are some attractive countries for exits, as well as for the acquisition of add-ons. The United States seems to be attractive for follow-on acquisitions by the platform firm, and even for exits. Of all the countries outside the platform firm countries, the United States has the highest number of exits (57) compared to the other regions, outside Europe.

In the next part of this chapter the methodology of the research will be described. The research approach will be described in detail, as well as the variables that will be included in the analysis.

2.3 Methodology

2.3.1 Strategy complexity

Hammer (2018) presents a novel index for B&B strategy complexity along three dimensions, as elaborated before. The purpose of this thesis is to enhance his complexity measures that seemed to be too general, as he simply considers a strategy to be complex if at least more than one add-on is different in terms of country and/or industry, but he disregards the influence of the supplementary add-ons on the complexity. To the best of my knowledge, no study has ever looked into combining additional notions of complexity, presented below, and the subsequent impact on the duration of the B&B strategy. However, I will follow his strategy by determining the complexity measured along the number of add-ons per strategy, the domestic or cross-border nature, and the industry the add-on operates in compared to the platform firm and supplement these notions by adding additional measurements.

Hammer (2018) utilizes three types of models to substantiate the strategy complexity. He refers to them as the reduced model, the extended model and the full model. Moving along these models corresponds to adding more dimensions of control variables.

$$Model\ 1: Y_i = a + \beta * \overrightarrow{Com_i} + IND + TIME + REGION + \epsilon_i$$

$$Model\ 2: Y_i = a + \beta * \overrightarrow{Com_i} + \omega * \overrightarrow{v_i} + IND + TIME + REGION + \epsilon_i$$

$$Model\ 3: Y_i = a + \beta * \overrightarrow{Com_i} + \omega * \overrightarrow{v_i} + \theta * \overrightarrow{w_i} + IND + TIME + REGION + \epsilon_i$$

Duration (Y_i)

The duration of the B&B strategy will be the dependent variable, '*Duration*' (1)[29], this will be created by measuring the difference between the date on which the platform company is acquired by the PE firm and the date the strategy is exited or is still active, or the uncensored and censored duration. The deals that are still active are considered to be right-censored and use the last-observed date as 'exit' date. It is important to make a distinction between the deals that were exited and are still active. Dropping the 'unexited deals' will obviously lead to biases in the results interpretation of the data analysis. The reason for censoring the data will be supported further on in this section about survival analysis. Information regarding the duration is retrieved from Zephyr and the private equity firm's website.

Complexity ($\overrightarrow{Com_i}$)

Hammer (2018) uses three binary indicators for complexity. *Single versus multiple*, whether the strategy involves multiple add-ons or just one. I will follow this method in order to differentiate the strategies, although I will extend the measurement with another variable. *Number of add-ons,* counting the number of add-ons acquired throughout the whole strategy. This is also important to evaluate whether there is a difference between acquiring and integrating twenty companies with a small size, compared to integrating five large add-ons, with respect to the size of the platform firm, this will be expounded further on. He then differentiates between a simple and a complex strategy. This is the sum of two binary variables measuring whether at least one add-on is *cross-border* or *domestic*, and whether at least one add-on is industry *diversifying* or *penetrating*. The sum of the binary variables determines the strategy complexity according to Hammer (2018). Simple strategies are formed by having a sum of one or lower, and complex strategies are formed by having a sum of one or larger. In this thesis the complexity measures are different and more extensive than in the research done by, among others, Hammer (2018). The complexity of the strategy is determined in multiple ways. Note that not for all the variables the source is presented in this section nor the detailed specification. However, in the variable list in the appendix, this information is presented.

The first measure is literally the complexity degree of the strategy. Differentiating between '*Simplest*' (3), '*Less simple*' (4), '*Complicated*' (5), and '*Hardest*' (6). The simplest types of strategies only involve domestic and industry penetrating acquisitions. For these strategies the platform firm potentially has prior industry knowledge and is likely to be within close proximity, and transaction costs are expected to be the lowest compared to more complex strategies. The subsequent level of complexity is referred to as 'Less simple', and these strategies involve acquisitions that are within the same country as the platform firm only, and more than half of all the add-ons are within the same industry as the

[29] The number next to the variable refers to the numbering order in the variable list in the appendix.

platform firm. The following degree of complexity, or third level, is defined as ‘Complicated’. These types of strategies are classified as ‘Complicated’ in case more than half of all the acquisitions are cross-border, and more than half of all the acquired add-ons are within the same industry as the platform firm. The most complex types of strategies are defined as ‘Hardest’. These types of strategies comprise of acquisitions that are cross-border for at least 50 percent of all the acquisitions, and are also for at least 50 percent industry diversifying. This kind of complexity is likely to bring the highest transaction costs compared to the other three levels of complexity, since more than half of the acquired firms along the strategy is cross-border and not within the industry of the platform firm. Whether the strategy is diversifying is measured through the difference between the 4-digit NACE sector.

The second measure of complexity of the strategy concerns the number of add-ons that are acquired by the platform firm. The number of add-ons is divided in four different levels. Specifically, ‘*Single*’ (7), ‘*Two*’ (8), ‘*Three*’ (9), and ‘*More*’ (10). For more information on this variable I would like to refer to appendix A: List of dependent and independent variables.

The third measure of complexity is determined by the ‘Distance’ of the strategy. The distance category is determined along four dimensions. Providing guidance for and monitoring the add-on firm will become more difficult and typically less frequent in case the distance is large. Therefore, I will include the geographic distance between countries. Centre d’Études Prospectives et d’Informations Internationales (CEPII) provides information on geographic distance between countries, measured as the great circle distance. This information was used for the distance between the platform firm and the subsequent add-ons, and thereby also including a distance for domestic acquisitions, as some countries in the sample are quite large. For this variable the average distance between the add-ons and the platform firm is used. The distance category is classified in the following way: ‘*Nearby*’ (11), ‘*Close*’ (12), ‘*Far*’ (13), and ‘*Furthest*’ (14). It is important to make use of this variable as the countries in the sample are of a different size. For instance, a French platform firm that only makes domestic acquisitions should face a different ease of operations-monitoring than a Dutch firm that makes acquisitions within the Netherlands.

The fourth measure of complexity is determined by the time between the add-on acquisitions. If a firm chooses to acquire multiple add-ons before integrating the previous add-on it potentially faces a more complicated process. To take this into account the variable ‘*Rushed strategy*’ (15) is included. This dummy variable takes the value of one in case the time between the add-ons is less than 286 days, or almost 0.8 years, which depicts the average time between add-ons in the sample. In this way, this thesis does not evaluate the individual time between successive acquisitions, though the analysis considers the time between successive acquisitions of the whole strategy on average. In case the time between the acquisitions is too brief, it could lead to a rush in the strategy and thereby becoming harder to monitor and control, referring to the ‘limited attention’ hypothesis. This also differentiates strategies that follow a path of acquiring all the add-ons at once or spreading the acquisitions throughout the holding period.

Another rationale for including the time-measurements is set forth by Aktas et al. (2013), indicating the benefits and costs of the time between successive deals.[30]

The fifth measure of complexity concerns the time between the initial platform acquisition and the subsequent first add-on. The dummy variable '*Rushed first add-on*' (16) takes a value of one in case the time between the two acquisitions belongs to the fastest 25% of the sample, or faster than 263 days. In case the strategy has a rushed first acquisition, it is likely that for instance management of the platform firm is not up to speed with their new owners or incentives are not aligned. Or, in case there is a short timespan between the two acquisitions the private equity firm has too little time to get acquainted with the platform firm and needs to simultaneously integrate the add-on and providing initial guidance to the platform firm. This hinders the start of an efficient B&B strategy from the beginning.

The following four measures of complexity refer to the individual country characteristics of the add-on firms. The first country specific measure is '*Investment attractiveness*' (17). Following Bekaert, Harvey, & Lundblad (2007), this variable presents the governmental attitude toward inward investment. This dummy variable takes a value of one in case the average of the scores of the combined add-on countries is higher than average, and otherwise zero. The second country specific measure involves '*Institutional quality*' (18). The investment attractiveness and institutional quality both are gathered from the International Country Risk Guide (ICRG). The institutional quality is measured via three subcomponents of the ICRG. Namely corruption, law & order, and bureaucratic quality. These components are then summed for all the individual add-ons. In case the average of the summed scores is above average, or above a score of 16.32, the variable takes a value of one, and otherwise zero. Unfortunately, the ICRG index only presents information up to and including 2016. Since the sample in this thesis considers also the years 2017, 2018 and 2019, a forecast is used for these years. The three subsequent years are forecasted by multiplying with the average growth rate of the five years preceding 2016. The third measure for country specific characteristics concerns the GDP per capita per country. '*GDP*' (19), which is the country's degree of economic output, and provides an indication for the standards of living in the specific country. To measure cultural differences, the variable '*Hofstede*' (20) is included. Cultural differences are measured through the average of the six Hofstede dimensions.[31]

[30] Aktas et al. (2013): Successive acquisitions may enlarge the size of the firm and increase diversity and thereby resulting in increased integration costs. In their model they show the acquirer's decision to undertake new acquisitions as a function of the time since the foregoing acquisition. With a simple graph they demonstrate there is an optimal time between successive deals, in which the first part, leading to the optimal point, of the graph depicts experience building and learning, whereas a too long period between successive deals leads to a memory loss.

[31] Available at Geerthofstede.com, for all countries a score was provided, except for the Bahamas (Jamaica score applied), Gibraltar (Great Britain score applied), Cayman Islands (Great Britain score applied), Papua New Guinea (score applied from research done by the University of Papua New Guinea, 2017, link), Tunisia (Morocco score applied), British Virgin Islands (Great Britain score applied). The lion's share of the sample includes countries for which six scores are available. For several countries however, only four cultural scores are provided by Hofstede, in these cases the average is taken of the four scores.

Buoyout entry channel and deal characteristics ($\vec{v_i}$)

The following set of variables concerns the entry channel through which the platform firm is initially acquired by the private equity firm, as well as the deal characteristics. Although the focus of this thesis is on the complexity and the corresponding exit, literature has indicated that the subsequent variables are essential to include. Therefore, these variables will not be analyzed individually, but will be included as control variables.

The first variable concerns '*Management participation*' (21) and takes the value of one in case the buyout involves a management buy-in or buy-out, MBO/MBI. This indicates whether the management is considered an investor also. In case management is considered an investor, literature suggests that these kinds of deals lead to improved governance, a decline in agency costs, and enhanced monitoring of the activities (Jensen, 1996; Cotter & Peck, 2001; and Weir, Laing, & Wright, 2005).

Furthermore, abiding by the methodology of Jelic (2011), the buyout entry channel and the corresponding deal characteristics of the initial buyout are imperative for the duration analysis. The variables presented below will take form as a dummy variable in the analysis, '*Entry type*' (22). *Private-to-private*, this dummy variable indicates whether the vendor of the platform firm is an independent private firm. *Public-to-private* acquisitions, meaning that prior to the initial buyout the platform firm was a publicly listed firm, i.e. a going private transaction. *Divisional*, this dummy variable takes the value of one in case the platform company has been a corporate division of subsidiary prior to the initial buyout. Jelic (2011) confirms his hypothesis that buyouts with a divestment as entry channel have a shorter investment duration.[32] The reason for this is that divestments, when the buyout involves a division or part of another organization, likely incorporate several constraints with respect to decision making by the former parent firms. Wright, Wilson, & Ken (1995) suggested that the use of a buyout structure could be an attempt to hastily get rid of the constraints, resulting in possible sooner exits. In case the platform firm is acquired from another private equity firm, through a secondary, tertiary, quaternary, or quinary buyout it is classified as *Financial*. Some firms are acquired from a governmental institution, *Privatization*, this dummy variable takes the value of one whether or not the platform firm is acquired form a governmental institution. Another type of entry channel is through a *Receivership*. Firms that are acquired during a liquidation process or bankruptcy tend to lead to a prolongation of the holding period. More time is needed to create a successful turnaround of the company. Interestingly, Strömberg (2008) suggests that firms that are acquired through a receivership tend to result in another phase of financial distress.

The next variable that will be included is '*Syndication*' (23) and is important according to Jelic (2011) since the skills of the individual private equity firms are pooled together and leading to more successful exits and enhanced potential IPO valuations. This theory is supported by the findings of

[32] Investment duration in this thesis is considered to be the same as the holding period, the time between the date at which the platform firm is acquired and the date at which the strategy is exited.

Strömberg (2008) indicating an acceleration of exits in case LBOs are acquired by syndicates. Furthermore, the individual efforts by the syndicate members are reduced and thereby leading to a shorter holding period although conjectured by Cumming & Johan (2010). Notwithstanding, Jelic (2011) also mentions that deal-syndication could potentially lead to conflicting interests and thereby increasing the likelihood of a pre-mature exit. Whereas conflicting interests could also lead to an increased investment duration because the interest-alignment takes time. Hammer et al. (2017) suggest that inorganic growth strategies with deal syndication are more likely to be disrupted by moral hazard. The information regarding the deal characteristics is retrieved from Orbis, Zephyr, and press-sources.

Firm and market characteristics ($\overrightarrow{w_i}$)

The next set of variables considers the characteristics of the private equity and platform firm. It is imperative to consider the (acquisitions) experience of the private equity firm. This is determined by two different types of variables. A dummy variable indicating whether the private equity firm has experience at all or not, this is defined by '*PE experience*' (24). To control for the relative amount of prior acquisitions the variable '*Total PE Experience*' (25) is included, this is a variable that indicates the total number of buyouts prior to the platform acquisition. This information is retrieved from Zephyr. The rationale behind the variables, however, is important according to Servaes & Zenner (1996) and Aktas et al. (2013). Reduced transaction costs are the result of acquisition experience. Additionally, as briefly mentioned earlier, repetitive acquisitions deliver learning gains. Therefore, the holding period could be decreased because of previous experience gained by the platform firm.

The second type of control variables for firm characteristics that will be added in the data analysis concerns the characteristics of the platform firm. The platform firm characteristics are measured along three dimensions. The first two variables coincide with the measures of experience of the private equity firm, namely '*PF experience*' (26) and '*PF total experience*' (27). The third variable that is included considers the size of the platform firm in the year prior to the buyout by the private equity firm, '*PF assets*' (28). This is included because according to Wright et al. (1995) and Nikoskelainen & Wright (2007), larger buyouts possibly lead to enhanced exit opportunities and a corresponding decreased investment period. It is a method to measure platform firm heterogeneity. Following Smit (2001), B&B strategies are pursued to gain a larger firm size and thereby enjoy the economies of scale, market power, and an enhanced valuation at exit. This measure for firm size is important to differentiate between platform firms with an initially small size from platform firms that already are of a large size. The reasoning follows that firms with an already larger size at the moment of the buyout could possibly shorten the B&B strategy and exit sooner. Nevertheless, larger companies are more difficult to monitor and provide guidance for, so firm size could also be seen as a reason for a prolonged investment period. The financial information is, as explained previously, acquired by making use of historical versions of Orbis, in this way the information is collected up until the beginning of the sample period.

The final set of control variables concerns the market conditions. Specifically, the activity in the worldwide M&A transactions and the IPO market. The variables '*IPO market*' (29) and '*M&A market*' (30) are calculated in the following way. Both variables are dummy variables that take a value of one in case the number of M&A transactions or IPOs in the year of the exit of the B&B strategy is higher than the average of the three years preceding the exit. In this way it is a measure of whether the market is 'hot' or 'cold' during the exit. The reason for this approach is as follows: According to the literature favorable debt and equity markets should incentivize firms to exit their strategy, therefore, an indirect measurement for this activity is by looking at the number of firms that choose to exit their strategy. Thereby, this also takes into account other factors that could lead to firms exiting their strategy, and these variables measuring the market characteristics include in this manner also other factors.

Finally, following Hammer (2018), fixed effects are implemented for the region, industry, and period.[33] The rationale behind the measurement of these fixed effects is mainly due to a lack of model convergence when using fixed effects and dummies for all the individual countries, industries and years. The issue of model convergence will be explained in the results section. The fixed effects are determined concurring with Hammer et al. (2017). Time fixed effects are determined per period or cycle.[34] Countries are grouped per region as described in Table 6.[35] Industry fixed effects are measured through the 2-digit Nace sector, leading to seventeen different main industries.

The methodology described above resembles the complexity of the B&B strategy and the corresponding investment duration. The second part of this thesis considers the exit types that are related to the B&B strategy. For this part of the research I will apply a survival analysis, which is described in detail below.

2.3.2 Survival analysis methods

Survival analyses have the goal to estimate the time for a strategy to experience an exit, it is also called 'Time to event' analysis. The time estimation is based on the duration between the acquisition date of the platform and the potential date of exit. There are five types of exit paths. Deals that are still active, or strategies that have exited via an IPO, trade sale, financial buyout, or dissolution. This data is retrieved from Zephyr, using the deal type and sub-deal type, and press-sources. The time to exit is modelled through different paths, and therefore requires a dynamic framework. Models that would be

[33] It is important to mention that the dummy variable for IPO and M&A market is not related to the fixed effects of the variable for time/period fixed effects.
[34] Period distribution: 1997 – 2001: Dotcom; 2002 – 2004: Post-Dotcom; 2005 – 2006: Buyout growth; 2007 – 2008: Buyout peak; 2009 – 2010: Financial Crisis; 2011 – 2012: Post-Financial crisis; 2013 – present: Recent years.
[35] Asia: *Hong Kong, Japan, and Singapore*; Rest of Europe: *Austria, Switzerland, Spain. Hungary, Italy, Czech Republic, Cyprus, Poland, Romania, Slovenia, Slovakia, Ukraine, Lithuania, Serbia, and Portugal*; Western Europe: *Belgium, France, Netherlands, Luxembourg, and Germany; United Kingdom: England, Ireland, and Cayman Islands*; Rest of World: *Israel, Qatar, Russian Federation, Kuwait, Bahrain*; Scandinavia: *Denmark, Finland, Norway, Iceland, and Sweden*.

best suited for this type of analysis are survival models. In short, these models assess the duration between two moments. In this thesis these two moments are the date at which the private equity firm acquires the platform firm, and the date the strategy is exited. The use of these types of models is extensive. Besides economic applications[36], survival models originate from engineering sciences, but are also frequently used in for example medical studies[37]. Regarding the economic applications, and the research in this thesis, it is possible that a strategy is still active at the moment of the data gathering. And therefore, the only thing that is known is that the particular strategy has not experienced an exit yet, meaning that their 'survival times' are longer than their time in the sample. These types of strategies are handled by labelling them as 'censored'. In short, this means that their survival times were cut-off. If this is disregarded, active strategies are treated equal to strategies that have already exited. A very important advantage of survival models is that they consider strategies that are still active. Simply looking at only the strategies that have exited and omitting strategies that are still active from the sample would obviously lead to significant biases. Strategies that are still active also provide information, which gives rise to right-censored strategy durations. Conventional OLS models are not appropriate for these kind of sample analyses as they cannot handle censoring processes. Survival analysis methods correct for censored observations and utilize the information borne in time to censoring processes. The date of the sample data collection, August 4th, 2019, is considered to be the right-censored duration and this does not lead to any estimation bias according to Giot & Schwienbacher (2007), who provide an extensive explanation about survival analyses and the applications. Since there are multiple exit-types, competing risk models are also used. These kinds of models distinctively consider multiple possible types of strategy exits. Thereby, the particular type of exit can feature its own dynamics and the exit decisions are impacted by the covariates separately.

Survival models are also called Hazard models. In survival analysis, the conditional instantaneous probability of exiting the strategy given that the particular strategy is still active at the date of the data collection is provided by the hazard function. In short this means that, for example in a medical experiment, the hazard of dying because of a heart attack at time *t* for a patient is the immediate probability of death by a heart attack at time *t* on the condition that the patient is still alive shortly before time *t*. Right-censoring of the data in the sample of this thesis is automatically achieved by creating dummy variables for the exits. In case the value of the dummy variable is 0 for all types of exits, it indicates the strategy is still active.

[36] Giot & Schwienbacher (2007); Cumming & Johan (2010); Wang & Wang (2012); Arcot, Fluck, Gaspar, & Hege (2015); Espenlaub et al. (2015); Jenkinson & Sousa (2015); Hammer (2016); Hammer et al. (2017); Hammer (2018).

[37] In medical studies right-censoring occurs in case a subject exits the experiment, or the experiment is stopped prior to the occurrence of an event.

The foregoing comprised a short overview of survival analyses. Below, I will elaborate more on the mechanics behind this estimation approach.[38] For readers that are familiar with the background of survival analyses I would recommend continuing reading from section 2.3.3 Competing risks.

A survival analysis estimates the probability of exiting and how it changes throughout the sample over time and how it changes for different values of the explanatory variables.[39] If for every potential strategy duration, the corresponding probability of exiting is collected, the probability distribution is the result. It shows how the probability of exiting the strategy changes over time. There are two important factors in survival analyses. The first one is the survivor function, which shows the probability of not exiting up to time *t*. The second important factor in survival analyses is the hazard function. Which is the conditional probability, of not having exited the strategy yet, by dividing the probability density function with the survivor function. The probability density function is the first derivative of the cumulative probability function, $F(t)$. This shows the probability that for every time *t* the duration is less than or equal to *t*. This is more comparable to the instantaneous probability of exiting the strategy than the probability density function presents. The relationship between the cumulative distribution function and the survivor function is given by $S(t) = 1 - F(t)$. Worth mentioning, because the probability of strategies exiting before or after the particular time t is strictly 1, under the assumption that all the strategies will exit after some time, the survivor function must be the complement to one of the cumulative distribution function, which results in the equation for the survivor function. What is important is that the hazard function is not really a probability. The reason for this is that time is a continuous variable, and thereby it can take an infinite number of particular values. When calculating the probability that a continuous variable will show a particular value, it needs to be divided by infinity, which is zero. Buis (2006) asserts that the hazard rate can be seen as the number of times a B&B strategy would be expected to be exited at the point where the risk of exiting would persist at a constant rate for one unit of time. For example, when the hazard rate is 0.2, and as in this thesis time is measured in years, it means that in case the hazard rate remains constant in the next year, the strategy will on average exit 0.2 times in the following year. In general, and to summarize the explanation above, there are four methods to describe the probability distribution. The survival function shows at every time *t* the probability of exiting a B&B strategy will take longer than that specific point in time. The second method indicates the probability that exiting the strategy will take less time than that specific time *t*, this is shown by the cumulative probability function. The third method, the probability density function, presents the probability at every time *t* of exiting the strategy at that

[38] Specifically, the different types of survival analysis methods will be explained. This thesis, however, applies a parametric Accelerated Failure Time (page 35) analysis instead of a semi-parametric Cox analysis (page 34), although both will be elaborated in the paragraph, to present a thorough introduction to survival models.

[39] Buis M.L., presents a thorough introduction to survival analyses, for more information than provided in this thesis I would highly recommend his paper “An introduction to Survival Analysis, April 2006”.

specific point in time, although it disregards that strategies, that have already exited before, do not have a possibility to be exited again. Lastly, the hazard rate, deals with the shortcoming of the probability density function, by indicating at every point in time the possibility that a strategy exit happens on that particular moment in time if the specific strategy has not been exited already.

In a very basic and generalized form, the survival analysis comprises the following equations:

$$1: F(t) = \Pr(T \leq t) = 1 - S(t)$$

$$2: S(t_j) = \left(\frac{n_j - d_j}{n_j}\right) S(t_{j-1})$$

F (t): The failure function, or exit function, and is specified as the complement of the survival function.

S (t): Survival function, or continued investment function.

Equation one presents the probability (Pr) that the strategy exit will happen after some specified time *t*. Equation two presents the survival function $S(t_j)$ in month t_j as the probability of the B&B strategy surviving beyond t_j conditional on the investment not having been exited until at least month t_j, multiplied by the survival function in the previous month t_{j-1}. n_j is the number of investments that have not been exited by the start of month t_j, and d_j indicates the number of interim exited during month t_j.

The distribution of the sample can be estimated in two ways. Through a non-parametric or a parametric analysis. Though, a third possibility is via a semi-parametric analysis. Non-parametric tests provide the advantage of not having to create many assumptions on which the results depend. However, when including multiple explanatory variables, it is difficult to isolate the individual effect of the variable on the outcome. Another drawback of non-parametric tests is that they only allow for qualitative variables in analysing the data. A variable measuring GDP per capita or a variable measuring distance (quantitative), for example, would immediately create a problem for this test. In the non-parametric test, only the qualitative variables will be considered. This could be a first reason for a parametric approach on the duration analysis of the complexity of the B&B strategy. This approach takes away the disadvantages of the non-parametric analysis since it delivers the impact of the explanatory variables on the duration of the strategy and it allows to make assumptions about the functional form of the probability distribution, which shows how the probability of exiting the strategy changes over time.

When opting to use a survival analysis it is imperative to analyse the distribution of the dependent variable (Duration) without making any assumptions about the shape. Refraining from making any assumptions is done via a non-parametric analysis.

— Insert Figure 3 and Figure 4 about here —

The distribution of the dependent variable is illustrated by the survivor function, which shows the probability that exiting a strategy takes longer than a particular duration length. Since this thesis includes censored observations, as shown in Figure 3 and Figure 4, the required method to analyse the duration is done through the Kaplan-Meier approach, equation 2. This approach makes it possible, although the probability of (not) exiting after the fourth of August 2019 cannot be gauged directly, by dividing the number of (un)exited strategies with the number of strategies, to determine the probability of (not) exiting before the end of the sample period. The basic theory behind the Kaplan-Meijer method is that the timeframe is divided. At every moment an exit occurs for one or more strategies, the probability for this exit is estimated by dividing the number of exits at that moment with the number of firms still in the sample (i.e. did not have an exit yet and are not censored). The survival function then combines these estimations across all the exit moments. In this way, the result is likely to be impacted the least by strategies that have exited halfway through the sample period. This survival analysis considers one exit-type only. In order to compare the different survival functions, relating to the other types of exit, a log-rank test could be applied. With this test it is possible to evaluate whether the different types of exit significantly differ from each other.[40] The test compares the observed differences between the survival curves with variances that could possibly arise in case there are no differences between the different types of exits. In this thesis the predictor variable is categorical, and therefore Kaplan-Meijer curves and log-rank tests would be most useful. There are, however, some drawbacks of using the Kaplan-Meijer estimations. Since the estimations are non-parametric, there are no assumptions made about the course of the duration distribution. The downside of this is that it limits the possibility to evaluate the impact of some background characteristics on the duration. Furthermore, in case there are quantitative predictor variables, the semi-parametric Cox Proportional Hazard (or hereafter 'PH') regression analysis is useful. These models work with categorical predictor variables, such as the dummy variables in this study which take the value of one or zero. With the Cox model, as with other multivariate analyses, it is possible to study multiple predictors at the same time. An important and useful advantage of making use of the Cox model is that the model provides an answer to the question 'How strong is the effect?', besides an answer to the question 'Is there an effect?' of a particular variable. The Cox model presents the size of the effect with the so-called 'hazard rates'. A hazard rate with a value of one indicates that there is no difference. Additionally, a positive (negative)

40 With a log-rank test, the null hypothesis states that the curves will not differ from each other.

coefficient indicates that a one-unit change in a particular predictor increases (decreases) the probability of an exit and thereby reduces (prolongs) the duration of the B&B strategy. Furthermore, the Cox model makes an important assumption, the proportional hazard assumption, which states that the hazard rates are constant in the timeframe. Moreover, this means that the relative difference between hazard rates, caused by different values of a predictor remains the same over time. The Cox model makes no assumptions regarding the distribution of the hazard rates or predicting variables, therefore the they do not have to be normally distributed. Another reason for using the Cox model is because it allows for time-varying covariates. In case of a multivariate survival analysis, the PH model is the most popular to assess the impact of particular variables on the survival time. Nevertheless, the assumption is violated in some cases by the data. This violation potentially leads to a biased interpretation of the analysis' results. As a solution, in case the PH assumption is not satisfied, another model can be used.

The survival analysis method that is often used in this case is called the Accelerated Failure Time model (or hereafter 'AFT'). The AFT models provide a solution since these kinds of models assess the effect of the covariates in the model directly on the survival times, instead of the hazard rates, as is the case in the semi-parametric Cox PH models. This model is used to examine factors that accelerate or delay the moments of exit. Basically, it assumes that there is homogeneity in the shape of the hazard curve for all the strategies in the sample. But for some strategies time passes by quicker than for other strategies. Buis (2006) makes use of a very practical example to illustrate the mechanics of the AFT model. He uses the relative age between dogs and humans for his example. Under the assumption that one-year lifetime of a dog is comparable to seven years of lifetime for a human, and for example in case humans have an 80 percent chance of living beyond the age of 84, then dogs have an 80 percent chance of becoming older than 12. This example demonstrates that the AFT models are related to the survivor function. An important advantage of the AFT models is that they are able to correct for weakness in terms of heterogeneity because of unobservable differences between the platform firms with regard to for example skills, expertise, or networks. The reason for this is that AFT models allow for a range of model specifications. For example, the frailty-model specification, which introduces a supplementary parameter that enters the regression in order to account for this unobservable heterogeneity. Which is comparable to regression models taking into account heterogeneity and fixed effects. This is important to make a distinction between strategies that have the same value for all the variables in the sample, since these strategies may not have a similar survival treatment. The AFT models, like the Cox model, also give rise to censoring the data and thereby include unexited strategies in the survival analyses. The difference between the AFT and the Cox model is that the direct effect of the explanatory variables on the survival time is measured by the AFT model, whereas in the Cox model the hazard rate is measured. The effect of this difference is that the results of the AFT analysis are easier to interpret, though it tends to be a matter of taste. This is because the predictors measure the effect of the related covariate on the survival time mean. In the AFT model there is an acceleration factor, which is the ratio of survival times corresponding to any fixed value of $S(t)$. The covariate effects are also considered to be constant and multiplicative on the time scale, meaning, the covariate impacts on survival by a constant factor, or acceleration factors. Acceleration is determined by a negative coefficient; deceleration is given by a positive coefficient. This is also one of the advantages of using an AFT analysis. The interpretation of the results is rather straightforward, since the parameters show the effects of the covariates on the mean survival time.

To make use of the AFT model, the hazard functions are modified to a survival function, which has the following form: $S(t) = S_0(a \times t)$. In this formula, a, is a parameter that moves the function down or up by a particular fixed fraction. What follows is that the function S_0 depends on the model. Determining the model is the following imperative part of the survival analysis. According to Buis (2006) theory should present arguments for choosing the optimal model for the analysis, in most cases. However, it is also possible to verify what model is optimal by manipulating the survivor function, through $-\ln\big(S(t)\big)$, which is done in this thesis. The model fit is evaluated by looking at whether the graph of the models presents a straight line in that particular graph. There are five different types of accelerated failure time models.

Type 1: The exponential distribution assumes there is a constant hazard rate. The cumulative hazard function, $H(t)$, depicts a straight upward-sloped line if this is true. When creating a graph with the survivor function plotted against time *t*, it is expected that this graph will depict a straight line, meaning the distribution is exponential. Type 2: Log-logistic, is verified by plotting ln $(\frac{1-\hat{S}(t)}{\hat{S}(t)})$ against $\ln(t)$. Type 3: Weibull distribution, the graph of ln $[-\ln\left(\frac{1-\hat{S}(t)}{\hat{S}(t)}\right)]$ versus $\ln(t)$. Type 4: Log-normal, in case the graph shows a straight line by looking at $\phi^{-1}[1-\hat{S}(t)$ against $\ln(t)$. Type 5: Gamma, this distribution is of limited use for survival analyses as the model does not have closed form expressions for the hazard and survival functions. Although for the use of frailty or heterogeneity analysis the model is very applicable as the distribution can take on many forms.

Recap, when utilizing a parametric approach, it is assumed that the probability distribution encompasses a particular functional form, which has several parameters defining the shape and or its location. This parametric analysis locates the values of the parameters that optimally suit the data. By exchanging the parameters with the function of explanatory variables, the explanatory variables can be incorporated. The course of locating the optimal parameter's values is done via a method called 'Maximum Likelihood'.

The AFT model would be used if there are several different populations, A and B for example, and each of these populations has their own survival function, $S_A(t)$ and $S_B(t)$. They are related to each other by some accelerated failure rate, as explained before, which defines the speed of the time that passes by per strategy. This factor is given by λ. Therefore, the two populations are linked to each other in the following way: $S_A(t) = S_B(\frac{t}{\lambda})$. Lambda determines the speed at which the strategy moves along the survival function. Furthermore, the lambda can be considered to be a function of multiple covariates, or complexity measures in this thesis.

By incorporating these measures, the survival time as a function of explanatory variables, is thereby stretched or contracted, with the use of the following formula:

$$3: S_A(t) = S_B(\frac{t}{\lambda(x)}).$$

And Lambda (x) is then defined by:

$$4: \lambda(x) = \exp\,(b_0 + \textstyle\sum_{i=1}^{n} b_i x_i)$$

The model is then accelerated or decelerated by the strategy's complexity measures.
The generalized linear AFT model can be expressed in the following way:

$$5: LN(T_i) = a + \beta \times \vec{u}_i + \epsilon_i$$

$T = Time\ to\ exit\ for\ i_{th}\ subject$

$a = Intercept\ term$

$\vec{u} = Covariate\ vector, as\ specified\ in\ the\ three\ models\ (i.e. reduced, extended, full)$

$\epsilon = i.i.d\ random\ variable\ with\ a\ common\ but\ unspecified\ distribution\ f(\cdot)$[41]

The information above describes the basic theory on survival analysis. In order to start with the analysis, one must choose between using a non-parametric or a parametric approach. This choice can be forced in case the model depicts a violation of the proportional hazard's assumption, meaning the Cox proportional model cannot be used. This is the case when categorical variables illustrate crossing hazard function, thereby indicating they are not proportional. The violation of only one covariate in the model is adequate for the whole model violation. There are two ways to test for the difference between survival functions, the log-rank test and the Wilcoxon test. The former is relatively more sensitive to differences at later points in the sample, whereas the latter is relatively more sensitive to differences at early points in the sample. When the proportional hazards assumption is violated the Accelerated Failure Time models provide a solution. As this approach has several options relating to the functional form of the distribution, one must verify the goodness of fit of the model. There are three ways to verify the model fit. The first and most common option is via the Akaike Information Criterion (AIC). In 1974 Akaike suggested to penalize every log likelihood in order to indicate the number of parameters that are being assessed within a certain model and comparing the results.

41 '*I.i.D: Independent and identically distributed variable. A collection of random variables is independent and identically distributed if each random variable has the same probability distribution as the other and all are mutually independent.*' Clauset, A (2011): A brief primer on probability distributions., Santa Fe Institute.

The AIC is determined in the following way:

$$6: AIC = -2(\log likelihood) + 2(c + p + 1)$$

C = the number of model covariates
P = the number of model-specific ancillary parameters

The AIC results provide an operational way of trading off the complexity of a particular model against how sound the fit is between the data and the model. Lee & Wang (2003) state that the Exponential and Weibull model are proportional hazard models, while the others are not. This means that if the other models demonstrate a lower value for the AIC test, it provides another reason for the violation of the proportional hazard's assumption. The second and third option to verify the model fit is via the maximum likelihood and a graphical test.[42] Important to mention, when looking at the log-likelihood, the largest number is the best-fitting model. Whereas the preferred model according to the AIC model is the distribution with the smallest value. This thesis will evaluate all the three tests for the model fit and let the outcome of the AIC be guiding.

2.3.3 Competing risks

Examining the individual type of exits is only a part of the analysis. It is important to compare the covariates and their influence on several types of exit simultaneously. Competing risks regressions are the preferred method for these types of analyses (Espenlaub et al., 2012). These regressions consider the following. For example, a soldier in the army may die because of a traffic accident or during a shootout. But both can't happen at the same time and can only happen once. This also holds for the B&B strategy, a platform firm might exit via an IPO, but cannot exit via a trade sale at the same time, therefore, the events are competing. Giot & Schwienbacher (2007) present a comprehensive introduction to the use of competing risks. The basic notion of these types of analyses is that the hazard rate may vary with the end state. The duration related to the unrealized state is truncated in the framework of a competing risks model (or hereafter 'CR'). This means that the attained state is contributing, via the density funciton, to the likelihood function, and the truncated states will contribute, via the survivor function, to the likelihood. The CR models are used to model the exit types and times to exit of the B&B strategies. In these models, dummy variables are used for the exit types 'Exit type' (2). This simplifies to strategies without an exit automatically having a value of zero for all the exit types and are thus treated as censored, so IPO=0, Trade Sale=0, Financial Buyout=0, and Dissolution=0. The effects of the covariates are then measured, for for example trade sale relative to IPO exits, in which

[42] These two options will be used as a robustness test for the choice of the distribution.

the IPO exits are then competing events. The use of a CR model, presented by Fine & Gray in 1999, has some advantages over the AFT model described previously. Firstly, the model is flexible and it does not require assumptions to be made regarding the functional form of the distbribution, specifically, the baseline sub-hazard. The second advantage concerns, as noted before, the possibility to evaluate competing events (Hammer et al., 2017). The main difference when using a CR model concerns censoring. In the regular AFT analysis right-censoring implies that the event can still happen and is not observed yet, whereas the CR model assumes the exclusion of one type of exit because another type of exit has occurred. Fine & Gray (1999) proposed a solution for this censoring process, through the maximum likelihood estimation of sub-hazard rates. The previously discussed Kaplan-Meier methods are not suitable for competing risk analyses, and deliver imprecise outcomes in case the marginal probability for cause-specific events is analyzed. The solution by Fine & Gray concerned the Cumulative Incidence Function (or hereafter 'CIF'), which estimates the marginal probability of a particular event as a function of the cause-specific probability and the total survival probability. In short, the CIF estimates the marginal probability for the competing events.[43] Fine & Gray developed the model by treating the Cumulative Incidence Function as a subdistribution function, and the hazard function is thereby derived from the CIF. In the CR models the dependent vairable is the sub-hazard rate. The cumulative incidence, or the probability of exiting the strategy before time *t*, is reduced through the happening of a competing event and strategies experiencing the competing type of exit are considered to be no longer at risk for the event or exit type of interest. Since the CR models present the hazard instead of the time to event, the interpretation is the opposite of the result's interpretation of the AFT analysis.

Furthermore, a very important notion of the CR model is that the prevalence of one type of event removes the specific subject from experiencing the risk of all other types of exit, and thereby the subject will no longer contribute to the successive risk sets. Espenlaub et al. (2012) present a clear definition of the CR model mechanics. In order to examine their determinants of a particular exit route compared to another exit route, they also make use of a CR model. In their research a competing risk model is used to verify the effects of determinants on different types of exit, for example IPO versus M&A, in which M&A exits are treated as a competing event. Moreover, exited strategies that are not modelled are treated as censored observations, and within these censored observations there is a competing event. In this thesis this concerns strategies that did not experience an exit through an IPO or a trade sale, for example. The term competing risk refers to the probability that instead of a strategy experiencing an exit via a trade sale, the strategy exits via a competing event, for example, via an IPO. This competing event, IPO, blocks strategies exiting via the event of interest, the exit via a trade sale. According to the Stata manual, this is an important notion, and may not be confused with the common censoring process

[43] Marginal probability: The probability of strategies that truly exited via the event of interest. Whether the strategies were treated as censored or 'failed' from other competing types of exit is disregarded.

in regular survival analyses, relating to strategies becoming censored due to a lack of an observed exit, and these strategies are still considered to potentially experience an exit. Yet, a strategy that has exited via an IPO, which is permanent, hinders that same strategy exiting via a trade sale. The difference relates to the following concept: regular censoring happens when the researcher is not able to observe the event happening to the subject, while competing events impeded the exit from happening at all. So, competing risks are events that either impede the observation of the event of interest happening, for example strategies that exit via an IPO, or alters the probability that the specific event happens.

In the next section the application of the survival analysis will be described as well as the observation of the most important results of the analysis.

3. Empirical results

— Insert Table 7 - Table 12 about here —

Before looking at the results of the survival analyses, Table 7 - Table 12 give a preliminary, but very important insight into the different degrees of complexity and the corresponding duration per categorical variable. According to the tables there is a clear ranking between the degrees of complexity and the duration. The highest average duration is found for the simplest type of complexity, followed by the hardest, complicated and less simple strategies, with a duration of 2,354, 2,302, 2,299, and 2,091 days respectively, this is irrespective of the exit-type. The least complex strategies have the longest duration. However, moving from 'Less simple' strategies to more complex strategies, meaning 'Complicated' and 'Hardest', a clear prolongation in the average duration is visible, although the difference is only marginal between the latter two degrees of complexity. According to Table 11, a ranking of strategy duration and the corresponding number of add-ons is observable. Strategies with only one add-on have the shortest average duration, while strategies with the highest number of add-ons have a prolonged duration, though shorter than strategies that involve three add-ons. The third category or determinant of the complexity of the strategy involves the distance between the platform firm and the add-ons. Table 12 presents the average duration per distance category. Strategies with the the lowest average distance exhibit the shortest duration. Furthermore, the three other variables of the distance category have a higher average duration than the 'Nearby' strategies, although the duration is increasing between 'Nearby' and 'Far' strategies, it is diminishing for strategies in the 'Furthest' category.

Considering Table 10, the most frequent exited strategy involved the 'Less simple' form of complexity, whereas the duration for this complexity type is the longest. The 'Complicated' type of complexity exited the least frequent. Besides the exit-frequency per complexity-type, it is also interesting to look at the type of exit that is the most likely per different degree of complexity. As Table 10 shows, regarding the 'Simplest' types of complexity more than half is exited via a trade sale, with an exit via a financial buyout as second place. For the 'Less simple' type of complexity an exit via a financial buyout seems to be the most likely, with a number of 76 exits, or almost 42 percent. The ‘Complicated’ strategies indicate to exit more frequently via financial buyout, although an exit via a trade sale seems to be probable also. For the most difficult types of strategies, or ‘Hardest’, an exit via a trade sale or a financial buyout it the most likely. For all degrees of complexity, except the ‘Complicated’ complexity type, exiting via an IPO is the least likely.

Another interesting way to look at the table is by looking from the perspective of the type of exit. According to the table, of all the strategies that have exited via an IPO, most strategies followed a ‘Less simple’ type of complexity. Regarding strategies that exited via a trade sale, the most frequent type of complexity is in the form of the ‘simplest’ kind. In terms of strategies that exited via a financial buyout, the most common type of complexity is of a ‘Less simple’ nature. Furthermore, the table indicates that the simpler types of strategies tend to exit via a dissolution, rather than relatively more complex strategies. Specifically, the ‘Simplest’ and ‘Less simple’ strategies, with a percentage of 32.8 and 39.7 respectively. Clearly there is a ranking in both the complexity and the type of exit. The ‘Simplest’ and ‘Less simple’ strategies comprise of 73 percent of all the exits. In terms of exit type, an exit via trade sale and financial buyout are the most common, together representing 81 percent of all the exited strategies.

These tables only present the characterstics of the sample and the variables, and thereby provide preliminary answers to the hypotheses. The tables indicate a relatively higher degree of complexity leads to a longer strategy duration, although the lowest degree of complexity presents the longest average duration. This also roughly holds when looking at the number of add-ons and the distance between the add-ons and the platform firm. These insights thereby partially reject hypothesis 1a, and accepts hypothesis 1b and 1c. The tables also provide an introductary answer to the second set of hypotheses. Strategies that exhibit a relatively higher degree of complexity tend to exit via a trade sale the most, and the least via an IPO, partially accepting hypothesis 2a. The same holds for strategies with a relatively higher number of add-ons, and thereby partially accepting hypothesis 2b.

To examine the effect of the variables on the duration and corresponding exit type in depth, a survival analysis approach is applied, in this way the uneven distribution of the sample is also taken care of, in terms of including censored observations.

3.1 Model fit

According to Hammer (2016 and 2018) and other survival analyses related literature, the parametric accelerated failure time model is the preferred methodology to be used in the duration literature. AFT models draw upon the before mentioned Kaplan-Meier weights in order to control for the censoring process. But before blindly following the research procedure of the referred to literature, the data is tested for the proportional hazard’s assumption, whether it is violated or not, since all datasets are different, this has to be tested for. This is done by plotting the categorical variables via a PH-test in

Stata with the '*stphplot'* command. Stata is the statistical analysis software that is used in this thesis to perform the research. As put forward in the methodology section, the violation of only one categorical variable in the model is enough to reject the proportional hazards assumption. This violation is illustrated clearly in Figure 5.

— Insert Figure 5 about here —

Since the violation is evidently illustrated in the two figures testing for the fulfillment of the proportional hazard's assumption, the choice for using parametric accelerated failure time models is supported, instead of the use of the Cox model, and thereby presenting a reason to follow the literature.

According to the information provided in the methodology section, one has to check the goodness of fit of the different models that can be chosen from, since a parametric approach is used. The first approach is to use the AIC test. The model that results in the lowest value for the test is the preferred model.

— Insert Table 13 about here —

According to the information in Table 13, the Log-Logistic distribution provides the lowest AIC value, followed by the Gamma, Weibull, Log-Normal, Exponential and Cox PH distributions. The difference between the Log-Logistic and Gamma distribution seems to be small, whereas the difference between the Log-Logistic and Cox PH distribution is large. This finding also supports the notion that the PH assumption is violated and the choice for a semi-parametric Cox analysis would be unwise. Irrespective of the findings of the Log-Likelihood and graphical test, which will be tested for as a robustness check, the AIC results should be followed. As a coincidence, the model that best fits the data in Hammer (2018) is also a Log-Logistic distribution.

The Log-Logistic (or hereafter 'LL') distribution model has the following survival function:

$$7: S(t) = [1 + (\lambda_i t_i)^{\frac{1}{\gamma}}]^{-1}$$

$$\gamma = Scale\ parameter\ to\ be\ estimated\ from\ the\ data.$$
$$\lambda = Parameterized\ as\ \exp(-X_i \beta).$$

As indicated before, the AFT model has a useful advantage in terms of the interpretation of the results. The coefficients in the output of the analysis, which will be shown shortly, may be viewed as altering the time scale by the Lambda factor. The results of the AFT analyses should be interpreted in the following way: positive coefficients indicate a deceleration of the specific variable, whereas a negative coefficient should be interpreted as an accelerating effect of the specific covariate. Positive coefficients therefore indicate a prolongation of the strategy compared to negative coefficients that indicate a faster time to exit.

In the next section the results of the survival analysis will be presented.

3.2 Results of survival analysis

The analysis in this thesis is divided in the following way. The first analysis will examine the duration of the reduced, extended and full model, for all event types. The second analysis will examine only successful strategies. Successful strategies, as indicated by the literature, are classified as IPO or trade sale. The third analysis will demonstrate a competing risks analysis. Specifically, Successful versus Unsuccessful strategies, and strategies that have exited via a trade sale versus strategies that have exited via an IPO. As a recap from the methodology section, the reduced, extended, and full model are determined in the following way:

$$Model\ 1: Y_i = a + \beta * \overrightarrow{Com_i} + \qquad IND + TIME + REGION + \epsilon_i$$
$$Model\ 2: Y_i = a + \beta * \overrightarrow{Com_i} + \omega * \overrightarrow{v_i} + \qquad IND + TIME + REGION + \epsilon_i$$
$$Model\ 3: Y_i = a + \beta * \overrightarrow{Com_i} + \omega * \overrightarrow{v_i} + \theta * \overrightarrow{w_i} + IND + TIME + REGION + \epsilon_i$$

Important to note is that many more variables have been evaluated in the survival analysis. This holds for the measures of complexity, the firm characteristics, market characteristics, and the fixed effects.[44] When including too many variables with the current sample size of the thesis, model convergence was not possible for several types of AFT models. This is common in the application of parametric survival analyses. Therefore, some variables have been altered to categorical variables. The variable list in the appendix represents the final variables that have been included in the models. For instance, including the dummy variables for the time, country, and industry fixed effects. The same convergence issue appeared for example in the paper by Hammer et al. (2017). Due to the need for model convergence the industries, have been grouped in seventeen different industries according to the main 2-digit Nace industries. Exit years have been grouped following Hammer et al. (2017) to private equity cycles or periods. Countries have been grouped also. For the specific grouping distribution, I would like to refer to Table 3 and Table 6, and Figure 1 panel b.

[44] These additional variables concerned the following measures, among others: *Neighboring strategies*, in case the strategy was diversifying but considered closely related; *PE and platform firm prior experience in cross-border and diversifying strategies*; *PE and platform firm age at entry*; *Number of syndicate members*; *add-on total assets*; *platform firm EBIT*, or earnings before interest and taxes; *platform firm ROA*, or return on assets; *platform firm interest coverage ratio*.

— Insert Figure 3 and Figure 4, and Table 14 about here —

For a detailed illustration of the survival curves per degree of complexity, number of add-ons, and type of exit, Figure 3 and Figure 4 provide a clear demonstration. The figures will not be discussed, however. Furthermore, Table 14 provides the summary statistics of the sample that is used in this thesis for the survival analysis. The statistics indicate that for both the reduced and extended model the sample size is the largest, all strategies are included. Whereas the full model, Model 3, is restricted to 917 strategies. This reduction in the sample size also restricts the number of uncensored observations or exits. In the next sub-sections, the survival analysis results will be described thoroughly, together with the implication of the results on the hypotheses. The goal of the survival analysis it to provide an overall picture of the duration of the B&B strategy and the driving factors without controlling for the type of exit before gradually examining the types of exit individually.

3.2.1 Duration of all exit types

— Insert Table 7 and Table 15 about here —

The first duration analysis considers all exit-types to be an uncensored event, meaning all the exits are treated as equal, irrespective of the type of exit, the duration is analyzed. This analysis will provide a clear insight into the effect of the measures of complexity on all the exited strategies.

When moving from the first to the third model or moving from the model with the reduced set of controls to the model with the full set of controls, the number of uncensored observations changes. In the first two models, of Table 15, all the types of exits are included, whereas in the full model only 343 exits are included and treated as uncensored.

The results in Table 15 indicate that for all the three models, a higher degree of complexity leads to a faster exit of the strategy, so irrespective of the type of exit, compared to the simplest form of complexity. These results are significant for all three models for the 'Less simple' form of complexity at, at least the 10 percent level, and for the variable 'Complicated' in the reduced and extended model. The results of this table are different than expected, since a higher degree of complexity would result in higher transaction costs due to a more complex strategy and therefore the strategy would be extended to cover these costs and meet the required investment return. Apparently, a simple B&B strategy, with only acquisitions that are domestic and industry penetrating are experiencing the longest investment period. The results contradict the findings of Buch & DeLong (2004), Malloy (2005), Butler (2008) and Lau & Yu (2010), who indicate that cross-border acquisitions tend to increase the transaction costs, due to increased difficulties regarding information production. However, the effect seems to diminish, since the coefficients tend to become less negative for higher degrees of complexity. Therefore, the results partially present what was expected, although not as strong as expected since a higher degree of complexity still experiences a sooner exit than the simplest form of complexity. A possible explanation for this diminishing effect could be because of the information asymmetries arising when firm are following a cross-border and industry diversifying strategy. Humphery-Jenner (2013) indicates that more management attention and resource allocation is required for these types of deals. Nevertheless, the negative coefficient, and thereby indicating an accelerating or faster time to exit, could be related to the higher costs for more complex strategies. Firms weigh the costs and benefits of their firms constantly. If the costs for monitoring and information production is too high, the strategy might be exit sooner. One other probable reason for the accelerated exit is according to Espenlaub et al. (2015) because of the created networks and opportunities leading to a more marketable product, and potential higher benefits by reducing the investment period, instead of delaying the strategy.

However, the results in Table 7 partially present what was expected. Disregarding the average duration of the simplest types of strategies, the sample characteristics indicates that the average duration for relatively higher degrees of complexity tend to prolong the B&B strategy (column 11).

For all the three models, in Table 15, a higher number of add-ons leads to a longer time to exit. This can be related to the limited attention hypothesis suggested by Cumming & Dai (2011), the acquisitions process might distract the attention from other value creating channels. What follows is that the monitoring capabilities of the firm's management are stretched, they have to monitor and provide guidance to multiple companies. To reach the full value potential of the add-ons integrated into the platform firm therefore requires additional time. Strategies that involve three or more add-ons are significantly decelerating the time to exit at the 5 and 1 percent level in the reduced and extended model, while in the full model the variables are significant at the 1 percent level. This perfectly coincides with the findings of Hammer (2018), who also finds that the number of add-ons has a significant effect on the prolongation of the investment period. In the reduced model, the variable 'More' leads to a prolongation of almost 40 percent, while 'Two' leads to a prolongation of 9 percent.[45] The significance for the variables 'Three' and 'More' even holds in the full model, in which all the control variables are added, and the sample size is reduced. A possible explanation for this strategy prolongation is because of the extra bargaining and enforcement costs, and thereby resulting in longer holding period, as was suggested by Hammer (2016). One other important finding in the results is the augmented prolongation when strategies involve a relatively higher number of add-ons, meaning the prolongation is stronger when firms increase the number of add-ons. This effect holds even when adding all the control variables in the full model, column 3. In the full model, the variables 'Two', 'Three', and 'More' have a prolongation of around 6, 29, and 39 percent, respectively.

The next category involved the average strategy distance between the platform firms and the add-ons. Compared to the strategies that are 'Nearby', in all three models the more distant strategies lead to

[45] Calculation: by exponentiating the coefficients of the results in the tables one can find the effect sizes. For example: in the extended model, column 2, the variable 'Three' indicates a coefficient of 0.203, this translates to $e^{0.203} = 1.225$, which indicates a prolongation of 22.5 percent.

a prolonged B&B strategy duration, except for the category 'Close' in the extended and full model. Furthermore, the categories 'Far' and 'Furthest' are significant around at least the 5 percent level in the reduced and extended model. This significance disappears when moving to the full model. Strikingly, these findings relate to the results of Buch & DeLong (2004), Malloy (2005), Butler (2008) and Lau & Yu (2010). In case the platform and add-ons are not located close to each other, transaction costs are increased due to the need for information production. The prolongation of the B&B strategy due to the distance variable also coincides with Giot & Schwienbacher (2007), who state that being located 'not too far away' from the investor, permits better monitoring and guidance. This potentially could lead to a more successful strategy, and a sooner exit. This is also suggested by Wang & Wang (2012) who relate the potential sooner exit to more efficient monitoring and information & communication.

The variable 'Rushed strategy' illustrates a negative and significant relation in all the three models, indicating that strategies that are making acquisitions faster than average decrease their investment duration. A possible reason for this acceleration of around 22, 22, and 18 percent for the reduced, extended, and full model, respectively, is because it has an overall effect on the strategy. Suggesting that waiting too long with additional add-ons is prolonging the whole strategy. This is the opposite of what was expected, since it was presumed that rushing a strategy would prevent the private equity firm from getting acquainted with the firm and the market and creating ample time to integrate the firms. Apparently, this is not the case. The same reasoning holds for the variable 'Rushed first add-on', which presents negative coefficients and significance around the 1 percent level across the reduced, extended, and full model. In the full model the strategies that rush their first add-on even accelerate their time to exit by 25 percent.

'Investment attractiveness' indicates a significant positive relationship in all the three models. In the full model the significance becomes larger, at the 5 percent level, and the coefficient remains positive. Irrespective of the type of exit, the variable indicates a decelerating time to exit of around 11 percent in the reduced model, 12 percent in the extended model, and a decelerating or slower time to exit of almost 17 percent in the full model.

The average score per country for law & order, corruption, and bureaucratic quality measured with the variable 'Institutional quality' presents a negative and significant relationship in the reduced and extended model, around at least the 10 percent level. In the full model a higher than average score for the institutional quality for the add-on countries results in a prolongation of almost 10 percent. However, the results present some interesting relations. Higher institutional quality should indicate more efficient legal systems that may mitigate for example agency problems and reduce the duration of the B&B strategy. This reasoning can only be applied to the results of the reduced and extended model, though.

The GDP per capita measured through the variable 'GDP' shows a positive relationship in all three models but is significant only in the reduced and extended model around the 1 percent level. This delaying impact coincides with the findings of Wang & Wang (2012). Probably against one's intuition, poorer countries, or in the case of this thesis, a GDP per capita lower than average, seem to outperform richer countries and thereby have a sooner achieved exit of the strategy. Their findings are related to the so-called 'convergence hypothesis' which suggests that poorer countries catch up with wealthier countries in the end.[46]

The variable measuring cultural differences 'Hofstede' is positive in all three models, and only significant, at the 5 percent level, in the reduced and extended model. Meaning that a higher cultural score leads to a prolongation of the B&B strategy. This contradicts the expectations, as it was presumed that there would be higher coordination costs for strategies that involved cultural differences, and thereby leading to a prolonged strategy duration. As the results indicate, strategies with an average score higher than the sample average tend to prolong the investment period, surprisingly. The significance however disappears in the full model, but the coefficient stays positive, with a prolongation of 8.3 percent.

The final two variables that are only measured in the full model are 'IPO market' and 'M&A market', both indicating a significant and negative relationship around the 1 percent level and an accelerating or faster time to exit of almost 30 and 60 percent, respectively. This perfectly relates to the expectation that the exit market conditions are imperative for the duration of the strategy. Irrespective of the type of exit as event of interest, the reasons potentially could be because of the following: As was explained, the exit is an imperative part of the B&B strategy, since the investors can extract their investment and a large part of the value added to the platform firm. Espenlaub et al. (2015) state that a more liquid stock market, and thereby a likely higher number of exits, provides windows of opportunity, to exit via an IPO. Espenlaub et al. (2015) also indicate that enhanced stock market liquidity boosts M&A exits due to the augmented availability of external equity funding for acquisitions. The relative impact of the market characteristics will be elaborated specifically in a following section regarding the particular types of exits.

The above described the results of the survival analysis, in case all exits were the event of interest simultaneously, in depth. What follows is the impact of the results on the established hypotheses.

It was expected that cross-border and industry diversifying acquisitions tend to prolong the duration of the B&B strategy as these types of strategies exhibit a different degree of complexity, compared to domestic and industry penetrating strategies. Table 15 indicates that a relatively higher degree of complexity tends to accelerate the time to exit, although the effect becomes smaller at higher degrees of complexity. However, the effects are negative in all three models and at every degree of complexity, therefore the hypothesis is rejected. This result is completely the opposite of what was expected, and the effect holds across all the tables regarding the survival analysis.

Furthermore, it was expected that besides the evident notion, that it is likely that multiple acquisitions require more time to be successfully implemented than single add-on strategies, additional

[46] The findings of Wang & Wang (2012), however, relate to venture capital firms.

add-on acquisitions should prolong the duration of the B&B strategy through the creation of supplementary transaction costs, such as for example enhanced monitoring and guidance necessities and employee cooperation.

Notwithstanding, Table 4 presented an important insight into the duration by just looking at the sample characteristics without performing any survival analysis. According to the information in the table, one can draw the conclusion that a higher number of add-ons tends to prolong the duration of the B&B strategy, by looking at the average duration that is needed for one single add-on. Table 4 also indicates that for additional add-ons the duration increases nevertheless only marginally but maintains a higher number of days compared to strategies that involve only one add-on. Aktas et al. (2013) presented a model about learning by doing multiple acquisitions. Therefore it would be expected that the data would show a lower average duration per add-on when comparing strategies that acquire 4 add-ons with strategies that acquire 8 add-ons, for example. However, the duration per add-on only becomes marginally shorter, and significantly longer than the duration for strategies that only involve one add-on. The survival analyis' results confirm the hypothesis that a relatively higher number of add-ons increases the time needed to exit, a decelrating time, or prolongation of the B&B strategy.

Moreover, it was presumed that more distant strategies tend to result in longer holding periods due to monitoring and guidance difficulties, whereas it was expected that relatively less distant strategies indicate a reduced holding period. Since countries are not of the same size, it was expected that besides cross-border versus domestic strategies, distance would be another driver of the duration of the B&B strategy. Table 15 clearly indicates that strategies with a relatively higher distance, overall, tend to prolong the total duration of the B&B strategy, and therefore the hypothesis is confirmed.

Additionally, it was expected that strategies that are rushed would have a prolonging effect on the duration of the B&B strategy. With less time between the initial acquisition of the platform firm by the private equity company and the subsequent first add-on, or the time between the subsequent add-ons. A probable reason for this prolongation was the limited attention hypothesis. The results in Table 15 indicate that firms rushing the strategy tend to exit sooner, compared to strategies that take more time. This holds for both of the variables relating to a rushed strategy. Therefore, the hypothesis is rejected. The results indicate that these variables accelerate the time to exit.

Country-specific factors of the add-ons were expected to have an imperative impact on the duration of the B&B strategy. For example, cultural differences that would affect the time needed to successfully integrate a company and align goals. The results in Table 15 indicate the variable are significant in determining the time needed to exit the B&B strategy, although the effects become insignificant in the full model, except for the variable measuring the government's attitude toward inward investment. However, in the full model, the four country-specific variables indicate a decelerating or longer time to exit. The results provide sufficient implications to accept the hypothesis.

The results' interpretation up until now only examined the drivers of the duration based on the drivers of complexity irrespective of the type of exit. In the next sub-sections, the exit types will be interpreted. Specifically, the duration of strategies that are considered to exit 'successfully', either via an IPO or via a trade sale. Together as event of interest and separately. Subsequently, the results of the survival analysis will be checked for robustness.

3.2.2 Duration of all successful exit types

— Insert Table 16 about here —

In the previous table, Table 15, the duration of the strategies irrespective of the type of exit was examined, this provides an overall picture of the B&B strategy. Clearly, as elaborated in the literature review, there is a distinction between the types of exits. Therefore, in Table 16, the results are presenting a relatively more in-depth view of the B&B strategy and the corresponding type of exit. Specifically, this table presents the results of the log-logistic accelerated failure time survival analysis treating only strategies that have exited via an IPO or a trade sale, together, as uncensored. These two types of exits are considered to be successful, since a dissolution clearly does not represent a successful exit, and when exiting via a financial buyout, the B&B strategy is not exited fully, since the strategy is likely to be continued by the new or subsequent private equity firm. Worth mentioning, the number of uncensored observations is therefore lower. In the first two models, or the reduced and extended model, the number of uncensored observations is 251, whereas in the full model the total number of uncensored observations is only 171. This means all other types of exits are treated as censored.

The measure for complexity brings about the following information. 'Less simple' strategies have a positive coefficient across all three models, though not significant. While the 'Complicated' and 'Hardest' strategies have a negative coefficient, indicating an accelerating or faster time to exit. The only significant result found is in the reduced model for 'Complicated' strategies, at the 10 percent level, and in the full model. Interestingly, when including the additional control variables, by moving from the reduced to the full model, the negative coefficient and the corresponding sooner exit, persists. For strategies that exit via an IPO or a trade sale, in the full model, this means that 'Less simple' strategies prolong the B&B strategy by around 4 percent, compared to the 'Simplest' strategies. Whereas the strategies with the two highest degrees of complexity speed up the time to exit by 27 and 9 percent, respectively. A potential reason for the variables indicating a sooner exit, could be related to the benefits of following more complex strategies. The cross-border and industry diversifying strategies create more exit opportunities through the created networks and the strategy becoming a more marketable product. Worth noting, the accelerating or sooner time to exit diminishes when comparing 'Complicated' with 'Hardest' strategies, and thereby the results partially present what was presumed.

The second set of variables for measuring the impact on the duration of the B&B strategy is the number of add-ons. Across all the three models, the variables do not show any significance, except for the variable 'More' in the reduced and extended, at the 10 percent level. The coefficients become larger when moving from two add-ons to more add-ons, in the reduced and extended model. In the full model the effect first becomes larger, while moving from 'Three' to 'More' the coefficient becomes smaller. The results indicate that the duration is related to the number of add-ons. Strategies that acquire two add-ons have a decelerating time to exit of 3 percent, three add-ons 15 percent, while strategies that acquire more than 3 add-ons have a decelerating time to exit of around 8 percent. These findings coincide with the research of Aktas et al. (2013). When firms acquire multiple companies there is a buildup of experience and learning gains, and repetitive acquisitions tend to lead to more efficient integration of companies and thereby reducing the total duration of the strategy. The results also confirm what was expected. Additional add-ons would create additional transaction costs, such as fees for due diligence and obtaining information on the add-on of interest. The limited attention hypothesis also provides a solid reason for the prolongation due to a higher number of add-ons. Management needs to be capable of overseeing all the processes and it will take longer to reach the full value potential of the B&B strategy.

The following variable, 'Rushed first add-on' has a negative coefficient in all three models and indicates different levels of significance. In the reduced model, the variable is negative and significant at the 5 percent level. In the extended model, the variable is negative and significant at the 10 percent level. In the full model, with all the control variables included, the variable is negative and significant at the 1 percent level and leads to an accelerating time to exit of 25 percent. This contradicts the expectations, since it was expected that adequate time would be needed for the private equity firm to get acquainted with the platform firm prior to making the first add-on.

Looking at the variables that indicate the average distance between the platform firm and the add-ons the following is illustrated: For all distance categories the coefficients are positive, indicating a prolongation of the investment duration. In the reduced and extended model, the variables 'Far' and 'Furthest' are significant at the 1 and 5 percent level, respectively. The significant variables in the full model are 'Far' and 'Furthest' at the 10 percent level. In the first two models, the effect becomes larger when moving from 'Close' to 'Far' and becomes smaller when moving from 'Far' to 'Furthest'. In the full model the effect becomes larger when moving along all distance categories. The results of the distance category variables are as expected. Distance between the platform firm and the add-on is considered to be imperative. Besides the previously mentioned monitoring difficulties and that providing guidance becomes harder, the distance also leads to information asymmetries. These larger distances result in a possible need for external advisors and information production, which is costly, taking into account that higher transaction costs lead to a prolongation of the strategy (Kesner et al., 1994; Boeh, 2011; Wang & Wang, 2012).

The variable 'Rushed strategy' is positive in all the three models but does not indicate any significance. The results indicate as what was expected. In case firms rush their strategy, and refrain from taking sufficient time between subsequent deals, the total duration will be increased, although the effect is rather small. This suggests that firms that exit via an IPO or a trade sale take adequate time between the acquisitions.

'Investment attractiveness' has a positive coefficient in the reduced, extended, and full model and is significant at the 5 percent level in the full model. However, an accelerating, or negative coefficient, or having a higher than average score for investment attractiveness would have been explained by the following: In case countries have a high investment attractiveness, or governmental attitude toward inward investment, it is likely that foreign investment tends to increase for example productivity in the specific country and market growth. The higher investment attractiveness also draws the attention of other investors, that could probably provide additional exit opportunities. This reasoning is however not explained by the results of the survival analysis and is therefore different than what would be expected.

The following variable 'Institutional quality' is negative in all three models, but only significant at the 5 percent level in the reduced and extended. Strategies that involve a higher than average score for the institutional quality tend to accelerate the time to the B&B strategy with only 3 percent in the full model. The result of this variable is, unlike the results of Table 15, as what was presumed.

The variable 'GDP' is positive in all the three models, and significant at the 1 percent level for the reduced and extended model. In the full model the variable is significant at the 5 percent level. Strategies that involve a higher than average GDP per capita seem to prolong the strategies for more than 30 percent in the full model. This effect is even present in the model without the additional control variables. In the reduced model, the prolongation is around 42 percent. These findings relate to the results of Espenlaub et al. (2015), who show that richer countries slow down the time to exit for both M&A and IPO exits, or the successful exits, for the reasons explained in the interpretation of Table 15.

The variable 'Hofstede' is positive in the reduced and extended model, but does not demonstrate any significance in the reduced, extended, or full model. Nevertheless, the accelerating effect in the full model of less than 1 percent indicates what would be logical, although the effect is marginal, since higher cultural values would present, for example, easier teamwork between the firms, leading to an accelerating time to exit.

The market characteristics, measured with the variables 'IPO market' and 'M&A market', both demonstrate a negative and highly significant coefficient, and an accelerating or sooner time to exit of around 21 and 64 percent, respectively. This is as expected, since this table examines successful exits only. In case the total number of exits via IPO or M&A is higher than the average of the three preceding years, it significantly leads to sooner exits of the B&B strategy.

Table 16 presents interesting results, however, only the results of Table 15, in which all the exit types are considered, will be evaluated in terms of testing the hypotheses.

For interested readers the survival analyses' results of the successful strategies separately (IPO and trade sale), are provided in the appendix, Table 17 and Table 18. The interpretation of the coefficients in the tables corresponds to the rationale provided in the interpretation of Table 15 and Table 16. In the next section the results of the competing risks approach will be discussed.

3.2.3 Competing risks model

This section will provide a comprehensive discussion of the results of the competing risks analyses. Table 19 presents the results of two approaches. The main benefit of the CR model is the option to compare events one on one.[47]

— Insert Table 19 about here —

An imperative difference when looking at the results of a CR model compared to the results of the regular AFT model, is the interpretation of the coefficients. In the CR model's results, the interpretation is the opposite. Meaning a positive coefficient indicates an accelerating time to exit, a smaller survival time, because of the increase in the sub-hazard rate. The CR approach is used only for the full model. In column one the event of interest is 'Successful' while the competing event is 'Unsuccessful'. Successful strategies exit via an IPO or a trade sale, whereas Unsuccessful strategies exit via a financial buyout or a dissolution, strategies that have not exited yet are not of interest and are therefore censored. In the second column the event of interest is trade sale and the competing event is IPO, meaning the other types of exit and unexited strategies are treated as censored.

Starting with the results in the first column, the variable measuring the degree of strategy complexity provides the following information: Strategies that follow a 'Less simple' approach tend to exit via a financial buyout or dissolution rather than via an IPO or trade sale. This effect does not hold for strategies that are more complex, or specifically 'Complicated' or 'Hardest'. These latter two types of strategies tend to exit via an IPO or a trade sale, although the effect is diminishing for the highest degree of complexities. This partially meets the expectations. Since more complex strategies tend to bring higher transaction costs that need to be compensated at exit. IPOs tend to deliver the highest returns, and for more complex strategies this seems to be the most probable type of exit. The results also coincide with the findings of Bonini (2015), suggesting that more fruitful investments tend to exit via an IPO or trade sale, and secondary buyouts are considered to be a last resort.

The second set of variables concerns the number of add-ons that are acquired during the B&B strategy. Strategies that involve 'Two' add-ons are more likely to exit successfully, the same holds for the variable 'More'. The effect is even stronger for a higher number of add-ons. Only for the variable

[47] Competing risks model command in Stata: '*stcrreg*'. When preparing the data to be used as survival data with the '*stset*' command, the event of interest is selected, and what strategies should be treated as censored. The option '*compete ( )*' tells Stata which of the censored strategies are the strategies that should be treated as competing events.

'Three' the results indicate that unsuccessful exits are more likely. In case strategies only acquire one or two add-ons it is likely that there are untapped inorganic growth opportunities, therefore an exit via a financial buyout seems to be probable. This effect is shown by the results only for strategies with three add-ons, however. The results therefore partially confirm what was expected. Strategies that acquire more than three add-ons have potentially exploited all the inorganic growth opportunities, and a subsequent exit via an IPO or trade sale seems more likely. Another explanation could be because of the size of the platform firm that has increased through the integration of the additional add-ons.

Strategies that have rushed their strategy in terms of time between the platform acquisition and the subsequent first add-on tend to exit via an IPO or trade sale, this effect is significant at the 5 percent level. According to the expectations, rushing the first add-on should create problems of inefficiency and thereby resulting in an extended B&B strategy overall, this result indicates the opposite. An unsuccessful exit via a financial buyout or dissolution was expected to be more plausible.

The categorical variables related to distance show a more likely unsuccessful exit. This effect holds for all the three measures for distance, and the results coincide with the expectations. Information production is costlier and monitoring the firm at a distance could present some difficulties for continuing the B&B strategy, as firms continuously weigh the benefits versus costs. Integrating firms that are not within proximity could create difficulties and delay the creation of synergies. The effect for the variables is also increasing with the distance, concurring with the expectations. Another reason relates to the time that is needed to achieve the investment return goals. In case firms choose to acquire add-ons that are more distant, more time is needed to integrate the firms into the platform firm. However, the investment period is limited by the life of the fund. If the strategy takes too long, a quick exit might be the most suitable option, specifically exiting via a financial buyout, instead of via a trade sale or IPO. This rationale can be related to the findings of Axelson, Strömberg & Weisbach (2009), Wang & Wang (2012), and Jenkinson & Sousa (2015) who state that firms are more likely to exit via a financial buyout in case the private equity firm faces augmented exit pressure.

Rushing the whole strategy, or having a shorter average time between deals than average, tends the strategy to be exited via a financial buyout or dissolution. This effect could be explained by the limited attention hypothesis, indicating management is unable to efficiently manage multiple processes simultaneously, and delaying the creation of the full value potential. In case this is the problem, a strategy exit via another private equity firm seems believable. In a worst-case scenario, the strategy exits via a dissolution.

The 'Investment attractiveness' variable suggests an unsuccessful exit is more likely. In case the government's attitude toward inward investment is benign, it could attract other private equity firms that might want to continue the B&B strategy and exploit remaining inorganic growth opportunity.

A higher average score in terms of institutional quality indicates strategies tend to exit successfully, or via an IPO or trade sale. A better or more efficient legal system might mitigate agency problems and therefore lead to a more efficient B&B strategy. Another potential reason is presented by Espenlaub et al. (2015), who suggest that in case of a higher institutional quality there are reduced agency problems and a smaller chance for adverse selection. Furthermore, they state that more value is attracted at exit, in case of an IPO, when the agency problems are lower.

Significant at the 5 percent level the variable ‘GDP’ indicates a strategy is more likely to unsuccessfully exit, instead of via an IPO or trade sale. This result contradicts the findings by Cumming et al. (2010), who indicate that higher economic development and output is related to a higher probability for exiting a strategy via an IPO or trade sale.

The variable ‘Hofstede’ shows that strategies with above average cultural values, on average for the whole B&B strategy, tend to be exited successfully. Cultural difference is an essential factor for differentiating successful deals versus unsuccessful deals, parity during the process of integrating firms is imperative (Olie, 1990). Ahern et al. (2012) posit that the likelihood of strategies exiting successfully, with respect to the creation of synergies, diminishes in the event of larger incongruity in terms of cultural values.

The final two variables, relating to the exit market conditions, specifically ‘IPO market’ and ‘M&A market’ both indicate, as expected, that it is more likely that B&B strategies exit successfully. The latter variable is also significant at the 1 percent level. These findings coincide perfectly with the results of Espenlaub et al. (2015), since they find that market liquidity speeds up the time to exit via an IPO and M&A.

Column two presents the results of the CR model when the event of interest is trade sale and the competing event is IPO, and the results are deemed to be imperative for this thesis. The choice for these competing events follows from the CR analysis of Successful versus Unsuccessful exits. The first variable of interest concerns the degree of complexity categories. ‘Less simple’ strategies tend to exit via an IPO, while ‘Complicated’ and ‘Hardest’ strategies are more likely to exit sooner via a trade sale. This result is even significant at the 5 percent level for the ‘Complicated’ strategies. The results are partially contradicting what was expected. A higher degree of complexity tends to correspond with higher transaction costs, for the reasons already mentioned. IPOs seem to deliver the highest returns of the different exit types, although the returns are not certain. Strategies that have incurred higher transaction costs during the strategy will opt to exit via an IPO to collect the higher returns. Apparently, this argument can only be related to the relatively simpler types of strategies, interestingly. A reason for the more likely trade sale exit of the B&B strategy is because of the time to exit is much quicker compared to IPOs. Besides, the returns are more certain and costs for exiting the strategy are lower, compared to IPOs. A plausible reason for the more likely IPO exit for the relatively simpler strategies could be related to firm size. As mentioned before, a larger firm is more able to bear the costs of an initial public offering. It is likely that strategies of a relatively simple complexity degree are able to acquire relatively more add-ons, since more complex strategies already involve higher transaction costs. This argument is also partially supported by looking at the sample characteristics, or Table 7 specifically. The table indicates that, by looking at row 6 – 9, the distribution of the degrees of strategy complexity relatively to the number of add-ons, shows that for a higher number of add-ons the complexity relatively corresponds to a simpler degree of complexity. If this reasoning is correct, the next variable corresponding to the number of add-ons, should also favor an IPO exit with a higher number of add-ons.

Moving to the next category involving the number of add-ons, the variable 'Two' indicates a positive coefficient, indicating that these types of strategies tend to exit via a Trade Sale sooner, than via an IPO. Whereas the other two categorical variables 'Three' and 'More' display a negative coefficient, indicating an opposite estimation of the exit and a more likely exit via IPO. This confirms the reasoning relating to the results of the previous variable regarding the degree of complexity. As Pagano et al. (1998) and Brau & Kohers (2003) indicate that larger firms are more able to sustain the higher costs that are incurred when exiting via an IPO. Another reason for the results promoting an exit via a trade sale in case of a lower number of add-ons is because of the smaller margins that correspond to smaller portfolio firms. The results also perfectly relate to the findings of Hammer et al. (2017), who indicate that add-on acquisitions during the B&B strategy increases the probability of exiting the strategy via an IPO. Furthermore, taking into account that firm size is determined by the number of add-ons, among other factors, a larger firm should attract more attention from investors and thereby increase the overall interest of the public, needed for a successful and high rewarding exit (Pagano et al., 1998; Brau & Kohers, 2003).

The variable 'Rushed first add-on' presents a highly significant and positive coefficient, meaning that strategies with this characteristic tend to exit sooner via a trade sale, rather than via an IPO.

The final set of categorical variables regarding the average distance show a negative coefficient along all the variables, suggesting that strategies that with a relatively larger distance between the platform firm and the add-ons tend to exit via an IPO. This effect becomes larger for more distant strategies and significant at the 1 percent level for the variable 'Furthest'. Referring once more to the impact of transaction costs that have to be compensated at exit to meet the goals with respect to investment returns set at the beginning of the strategy. The following three reasons seem probable for a higher amount of transaction costs. First of all, according to Kesner et al. (1994) and Boeh (2011) information asymmetries are more likely with a larger distance, negotiating takes longer, and there are fees for the advisors needed. Secondly, a larger distance is likely to create integration difficulties. The degree of teamwork and coordination is highly dependent on distance according to Harding & Rovit (2004) and Lajoux (1998). Thirdly, as mentioned earlier, in case firms are not within proximity of each other, providing guidance on, and monitoring the processes becomes more difficult (Kang & Kim, 2008; Wang & Wang, 2012; and Bernstein et al., 2015). These higher transaction costs potentially make an IPO exit more likely, due to the higher compensation for the costs.

The following strategy characteristic, specifically, the variable 'Rushed strategy' has a negative coefficient, meaning these types of strategies tend to exit via an IPO sooner than via a trade sale.

The variables 'Investment attractiveness', 'Institutional quality', and 'GDP' are also indicating a negative coefficient between trade sale exits and IPO exits, although they lack significance. Investment attractiveness seems to be a more determining factor for strategies exiting via an IPO. This result can be related to the findings of Schwienbacher (2002). According to his research firms with, among other characteristics, abundant growth potential tend to exit via an IPO. In case the government promotes inward investments, it could be a reason for market growth and offering future growth potential for the firm. Furthermore, the result of the variable regarding institutional quality concurs with the theory of Espenlaub et al. (2015), who suggest that in case of a better and more efficient legal system agency problems are reduced and more value is attracted when firms exit via an IPO.

The variable 'Hofstede' has a positive coefficient and indicates that in case the strategy involves an above average score for the Hofstede cultural values it will lead to a sooner exit via a trade sale than via an IPO.

The variables that involve the market characteristics at exit, 'IPO market' and 'M&A market' both show a positive coefficient, and the latter variable is even significant at the 1 percent level. Interestingly, the two variables both favor strategies to exit via a trade sale instead of via an IPO. It would be more logical that the two variables would indicate opposite signs, and both promoting the two exits separately. However, the event of interest is trade sale opposed to IPO, the effect of the variable 'M&A market' is highly significant and much stronger than the variable regarding the IPO market, therefore the result partially confirms the expectations.

Next, the second set of hypotheses will be evaluated, relating to the B&B strategy complexity on the corresponding exit.

The relatively simpler strategies, for example domestic and industry penetrating, leave room for another private equity firm to consolidate the market and do not bring extensive transaction costs. It was expected that these kinds of strategies would have a shorter duration than relatively more complex strategies. The degree of complexity and the prolonged duration will be rewarded by exiting through the highest paying exit type. Table 19 provides the information to reject or accept the hypothesis. In column 1, the results of IPO & trade sale versus financial buyout & dissolution is presented. According to expectations, relatively more complex strategies tend to exit via an IPO or trade sale. Therefore, the hypothesis is accepted.

However, in case 'Distance category' is also considered to be a determining factor for complexity, the results favour an unsuccessful exit, clearly.

Additionally, leaving less room for a second buyer, through a financial buyout, to continue the B&B strategy, it seems more likely that strategies with a higher number of add-ons tend to exit via a trade sale. It was expected that the acquisition of multiple add-ons, results in a larger overall firm size and thereby the firm is able to sustain the larger fixed costs incurred during the process of an IPO, or leave no room for continuation of the inorganic growth strategy, and exit via a trade sale. The results in Table 19, overall, favour the assumption that strategies with a relatively higher number of add-ons tend to exit successfully. Therefore, the hypothesis is accepted.

Furthermore, it was expected that in case the exit market conditions, determined by the activity in the M&A and IPO market, are favourable, strategies tend to exit via a trade sale or an IPO, rather than via a financial buyout or dissolution. According to the results in Table 19, the exit market conditions are significantly relevant for strategies exiting via an IPO or trade sale as opposed to a financial buyout or dissolution. This effect also holds when comparing IPO exits with trade sale exits. Clearly, the market conditions are a determining factor for the of exit. This also holds for the results in Table 15, irrespective of the type of exit, the exit market conditions are imperative for the duration of the B&B strategy. Therefore, the hypothesis is accepted.

— Insert Table 20 about here —

Table 20 provides an overview of whether the hypotheses are accepted or rejected.

In this section argumentation was provided in order to sustain or reject the established hypothesis. The following section presents the tests for robustness of the results. In the next chapter, the conclusion will be provided, and thereby indicating whether the main research question of this thesis has been answered. The next chapter also presents some fruitful areas for future research.

3.3 Robustness tests

To verify the robustness of the results in this thesis the choice for the model is tested. This is imperative since the results are based on a parametric survival analysis, meaning that the choice for the model is the basis for trustworthy results. In case the wrong model is chosen to fit the data, the results present bias. Another check for the robustness of the results is to look into other factors that present the complexity of the B&B strategy, specifically, whether the individual influence of cross-border and diversifying strategies deliver the same results as the categorical variables used in the survival analyses presented in the previous section.

3.3.1 Model fit

In the methodology section it was put forward that fitting the model can be done in at least three ways. The first option is via the AIC test, the model with the lowest value should be picked for the successful analysis. This outcome is also leading in case the other options present different results. This holds for nested models. Nested models present a special case. These models are to be considered a family, when a particular distribution includes other distributions as a special case. For example, the

Weibull distribution is reduced to an exponential distribution when the $\gamma = 1$. This means that the exponential model is a special case of the Weibull distribution (Lee & Wang, 2003). Nested Accelerated Failure Time models can be compared using a likelihood ratio test, which is shown in Table 21. The log-normal, Exponential, and Weibull model are nested within the Gamma model.

— *Insert Table 21 about here* —

Table 21 shows that the Log-Logistic model has the largest likelihood and is thereby the preferred model. Furthermore, the likelihood ratio test is not valid for comparing models that are not nested. To check the choice for the preferred model with non-nested models the AIC test can be used, as was done in the results section. The AIC test provided the lowest value for a LL distribution, and was therefore the preferred model, the results are however quite close to each other. Besides, the results indicate that the Exponential distribution has the highest value and is therefore the least preferred model.

The third method to verify the choice for the distribution model and goodness of fit, is via residual plots. As determined in the methodology section, the distribution models present a good fit when they are parallel and close to the line with a unit slope of one and intercept of zero. The model that depicts the closest and most parallel distribution, is the model that provides the best fit and is therefore the preferred model. The residual plot is also called the plot for Cox-Snell residuals, and can be applied to any parametric model (Lee & Wang, 2003). It involves plotting the cumulative hazard of the residual, for every model, against the Cox-Snell residual.

— *Insert Figure 6 about here* —

Figure 6 presents the plotting of the different models against the Cox-Snell residuals. As put forward above, the preferred model is the one with a slope close to the line with a unit slope of one and an intercept of zero. The first striking finding is shown by the Exponential distribution, Figure 6 panel A, which clearly supports the finding of the AIC test, that this distribution presents the least preferred fit. It also proves the assumption to use a parametric-survival analysis, and an AFT model as the proportional hazard's assumption is clearly violated, due to the poor model fit. Whereas the other distributions provide a better fit. Especially the Gamma distribution in Figure 6 panel B follows the line with a unit slope of one and intercept of zero very closely. When considering the three tests for the goodness of fit, and the AIC test is the leading test, the choice for the log-logistic model is supported.

3.3.2 Different measures of strategy complexity

The proposed measures of complexity in the methodology section stem from several underlying factors that determine the complexity of a strategy. The basis for the complexity is defined by whether the strategy involves acquisitions within the same country as the platform firm, domestic, or are of a cross-border nature. The same holds for the complexity difference when comparing strategies that comprise of acquisitions within the same industry as the platform firm, or in another industry, and are therefore industry diversifying. These two degrees of complexity should deliver the same results as the results in case the measures of complexity are put together in four categorical variables: 'Simplest', 'Less simple', 'Complicated', and 'Hardest'. This different approach is tested, and the results are presented in Table 22.

— Insert Table 22 about here —

Table 22 has the same build-up as Table 15 – Table 19, with respect to gradually adding more control variables when moving from the reduced, to the extended, and finally the full model. Table 22 presents the results irrespective of the type of exit, so all the four exit types are included and treated as uncensored. When looking at the first set of variables, concerning the strategy nature. 'Diversifying' (31) and 'Cross-border' (32) strategies both indicate to reduce the duration of the strategy, as they encompass a negative coefficient. This holds for all the three models, except for the full model, where the variable 'Cross-border' presents a decelerating time to exit. The next categorical variable, concerning the number of add-ons has the following results. For the reduced, extended, and full model the variables have a positive coefficient for all the three variables. The variable 'Two' is significant at the 10 percent level in the reduced and extended model. The variable 'Three' is significant at the 5 percent level across all the three models. And the final variable in this category, 'More', is significant at the 1 percent level in all the three models. The effect is also becoming larger when moving to a higher number of add-ons, this holds for the reduced, extended, and full model. The next variable 'Rushed first add-on', is significant, at the 1 percent level, and negative in all the three models. The distance category presents the following results. The variable 'Close' is negative and insignificant in all the three models. the variable 'Far' is positive in the reduced, extended, and full model, and significant in the reduced and extended model around the 5 and 10 percent level, respectively. The variable 'Furthest' is positive in the reduced, extended, and full model, and significant only in the reduced model at the 10 percent level. What is more, the coefficients become larger when moving from 'Close' to 'Far' across all the three models and becoming smaller when moving from 'Far' to 'Furthest'. Furthermore, the variable 'Rushed strategy' has a negative coefficient in all the three models, and is significant at the 5 percent, 5 percent, and 10 percent level, respectively. The variable measuring investment attractiveness, 'Investment attractiveness', is significant at the 10 percent level in the reduced model and at the 5 percent level in the full model. Besides, the coefficient is positive in the reduced, extended model, and full model. The variable ‘Institutional quality’ is negative in the reduced and extended model, while the full model is showing a positive coefficient. Significance is found at the 5 percent level in the reduced model, and at the 10 percent level in the extended model. The next variable, measuring the GDP per capita, ‘GDP’, is positive in all the three models, and is significant at the highest level in the reduced and extended model. Cultural differences, measured by the variable ‘Hofstede’, have a positive coefficient across all the three models. and is significant at the 5 percent level in the reduced and extended model. The exit market conditions, measured by the variables ‘IPO market’ and ‘M&A market’, have a negative coefficient and are significant at the 1 percent level, indicating an accelerating or faster time to exit. The results of the robustness test coincide with the findings of the survival analysis with the proposed measures of complexity in Table 15. This holds for the results in the reduced and extended model. In the full model, the ‘Cross-border’ variable presents a decelerating time to exit, however. Indicating that strategies with a cross-border nature tend to have a prolonging duration of the B&B strategy.

The final and following chapter of this thesis will present the concluding remarks and a review of the research by indicating the limitations and suggestions for research to come. Furthermore, the chapter will verify whether the research question has been answered by the results of the survival analyses of the B&B strategy.

4. Conclusion

Two noticeable recent trends in the private equity industry suggested that PE firms are using inorganic growth strategies at a larger scale and the corresponding investment period has increased. The extension in the holding period entails several disadvantages for both the GPs and LPs. Among other reasons, future fund-raising opportunities could be unfavorably affected, as the extended period could reflect the capabilities of the private equity firm. Short investment periods tend to indicate that investment targets were met early and the funds can be put elsewhere. Given these two trends and the presumption that the strategies pursued by private equity firms are distinct, it seemed interesting to examine the drivers of the prolongation of the investment period with respect to the B&B strategy. Inorganic growth strategies are different in nature. Some are cross-border and industry penetrating, while others are domestic and industry diversifying. Besides the different nature, some strategies also involve a relatively higher number of add-ons. Furthermore, it is likely that these differences in nature present different types of complexity, and therefore should affect the duration of the B&B strategy in distinct ways. Taking into account that the exit of the strategy is an essential part of the process, in order for the investors to claim their rewards of the investment, it was assumed that the complexity of the B&B strategy would be a determining factor for the type of exit. The basis for the examination of the effect of the strategy complexity on the duration of the B&B strategy and the subsequent exit type, was presented by Hammer (2018). Existing literature however offered a too broad view of the strategy complexity and the corresponding duration of the B&B strategy. The aim of this thesis was therefore to present a comprehensive and more in-depth analysis of the drivers of the B&B strategy duration and the subsequent strategy exit. The proposed theory and recent industry trends formed the following research question:

Is the complexity of the buy-and-build strategy a determining factor for the holding period and the corresponding type of exit?

In order to answer this question a dataset was collected that comprised of European platform firms and worldwide add-on acquisitions between 1997 and 2019. To analyze the dataset an accelerated failure time model was applied. This parametric survival analysis approach considers both strategies that have experienced an exit as well as strategies that are still active, as opposed to conventional OLS regressions. By differentiating between different degrees of complexity, number of add-ons, the speed of acquisitions, the distance between platforms and add-ons, several country specific factors, and exit market conditions the survival analysis presented the following results: Irrespective of the type of exit, meaning all the strategies that experienced an exit are considered as uncensored, indicated that strategies that involve a relatively higher degree of complexity tend to exit sooner compared to simpler types of strategies. The number of add-ons implied a highly significant and prolonging effect on the duration of the B&B strategy, strategies that acquire relatively more add-ons have the tendency to experience an increased holding period. The same effect holds for the average distance between the add-ons and the platform firm. Notwithstanding, strategies that are rushed, in terms of the average time between deals, and the time between the initial acquisition of the platform firm and the subsequent first add-on, are likely to exit the strategy sooner, as opposed to what was expected. Country specific factors, such as the GDP per capita, institutional quality, and cultural values measured by Hofstede scores, indicated to be relevant for the investment period of the B&B strategy. The results regarding the complexity of the strategy and the related duration were as expected. However, the effect of the degree of complexity of the B&B strategy on the holding period turned out to be the opposite of what was expected.

The second part of the research examined the complexity of the B&B strategy and the subsequent exit. Strategies that are considered to be exited successfully, either via an IPO or a trade sale, are more likely in case the B&B strategy has a relatively higher degree of complexity. Meaning that strategies that are industry diversifying and/or cross-border tend to speed up the time to exit of the B&B strategy. Whereas the opposite holds for the number of add-ons and the average distance between the add-ons and the platform firm. Strategies that acquire relatively more add-ons and have a relatively larger average distance tend to experience a prolonging duration of the B&B strategy and thereby the time needed to exit via an IPO or trade sale is increased. Furthermore, country specific factors tend to be relevant in determining the likely exit of the B&B strategy. The same holds for exit market conditions; the number of IPO and M&A transactions tend to significantly accelerate the time to exit of the B&B strategy, mainly for strategies that exit via an IPO or a trade sale. The research also proposed a comparison of the drivers for strategies that exit via a trade sale or IPO with a competing risks analysis. Strategies that have a relatively higher degree of complexity tend to exit via a trade sale, whereas strategies with a relatively higher number of add-ons and a larger average distance tend to exit via an IPO.

The results of the survival analyses present very interesting insights into the drivers of the duration of the B&B strategy and the related exit type. The complexity of the strategy, measured by among others, the nature of the strategy and the number of add-ons, indicates to be very relevant for the duration of the B&B strategy and the subsequent exit. Furthermore, the results largely coincide with the conclusions of existing literature.

Future recommendations and limitations of the research

This thesis has proposed an extension to the work of Hammer (2018) who presents a unique approach in considering the complexity of the B&B strategy and the related exit. The results of this thesis however indicated that a higher degree of complexity tends to accelerate the time to exit. The opposite relation was expected. Relatively more complex strategies involve higher transaction costs that have to be covered, making a longer duration more likely. It seems very interesting to verify this result by investigating other regions in the world, or by taking a closer look at the four different degrees of complexity.

One potential limitation of this research are the characteristics of the sample concerning the distribution of strategies. 60 percent of the sample relates to strategies that only acquire one add-on, and roughly 80 percent of the sample describes strategies with one or two add-ons, leaving only 20 percent for strategies involving more than two add-ons. To test the argumentation of Aktas et al. (2013) it would be necessary to have a larger amount of strategies that involve multiple acquisitions. In that way it would be possible to verify whether the duration per add-on would become shorter when firms are increasing the total number of add-ons, because of learning and the acquisition of multiple add-ons becoming a repetitive process.

Another interesting subject is related to the speed of the B&B strategy. The survival analyses presented contradicting results, in terms of what was expected. Specifically, one could examine the drivers of the time that is needed between the initial platform acquisition and the first add-on, or the drivers of the average time between subsequent deals.

Another fruitful area to examine is the impact of the control variables used in this thesis. The set of control variables, determined by the reduced, extended, and full model, were disregarded in the interpretation of the results of the survival analyses. One could study the impact of the firm and deal specific variables.

Finally, a potentially relevant driver of the time to exit could be related to the performance of the strategy. The literature review briefly described the relation between strategy complexity and the realization of synergies. For example, by creating economies of scale, through the acquisition of multiple add-ons. This could be measured by performance indicators and related to the complexity of the strategies. Additionally, Bansraj et al. (2019) find that the realization of synergies is very much related to the probability of exiting the B&B strategy. This thesis has disregarded the performance measures and focused specifically on the impact of the strategy complexity, the duration, and the subsequent exit. Including this effect might deliver some interesting results, therefore future research could include financial performance measures as subject of interest. Notwithstanding, firm size, measured by the total assets at entry, was included in the survival analyses. Due to the dilemma of model convergence, additional variables could not be included, this holds for performance measures relating to for example return on assets.

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Appendix

A: List of dependent and independent variables

Dependent variables, descriptions and sources

Category	Variable	Description
	(1) Duration	Uncensored deals: exit date – entry date. Censored deals: last observed date – entry date. Remark: Only deals with known exit status have been included in the sample, censored deals concern strategies still active as of 4th of August 2019. The natural logarithm is used for the variables in the data analyses. Source: *Zephyr, PE sponsor websites.*
	(2) Exit type	Four different dummy variables indicating whether the strategy is exited via IPO, trade sale, financial buyout, dissolution, or is still active. Source: *Zephyr, PE sponsor websites.*

Independent variables, descriptions and sources

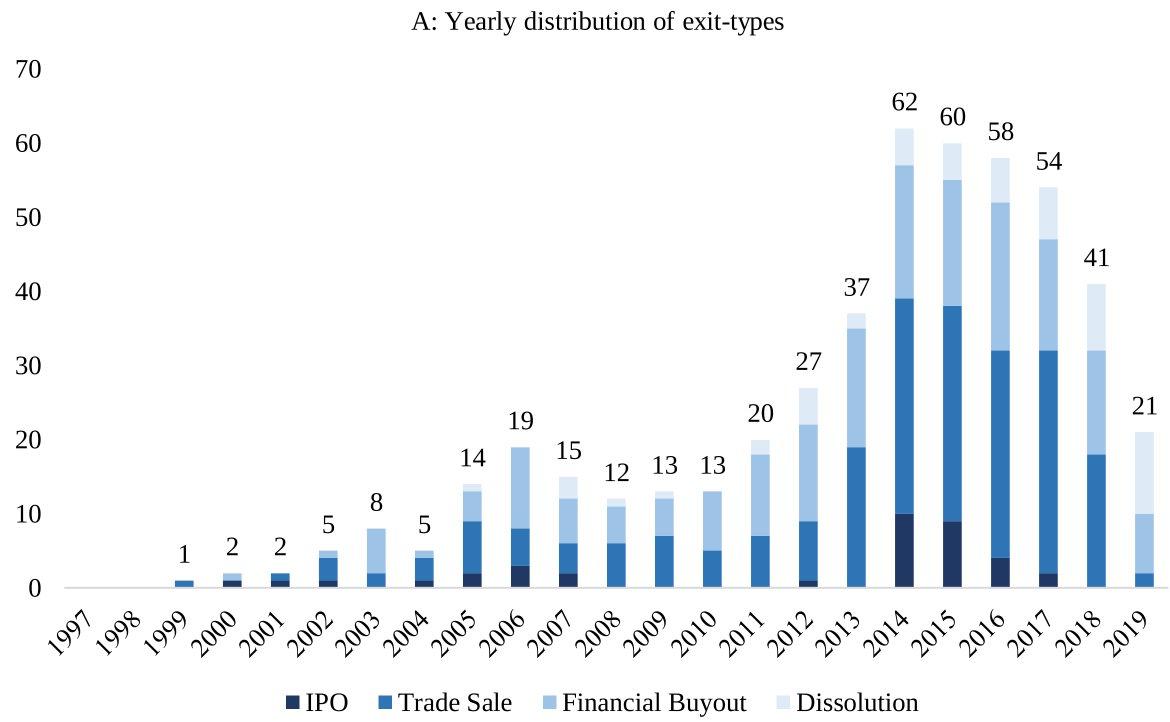
Category	Variable	Description
Complexity degree	(3) Simplest	Dummy variable indicating the simplest type of strategy, taking a value of one for strategies that involve only domestic and industry penetrating acquisitions, and otherwise zero. Source: *Zephyr*.
	(4) Less simple	Dummy variable indicating a less simple type of strategy, taking a value of one for strategies that involve only domestic acquisitions, and for which at least half of all the acquisitions are industry penetrating, and otherwise zero. Source: *Zephyr*.
	(5) Complicated	Dummy variable indicating a complicated type of strategy, taking a value of one for strategies of which more than half of the strategies are cross-border and industry penetrating, and otherwise zero. Source: *Zephyr*.
	(6) Hardest	Dummy variable indicating the hardest type of strategy, taking a value of one fore strategies of which more than half of all acquisitions are cross-border and industry diversifying, and otherwise zero. Source: *Zephyr*.
Number of add-ons	(7) Single	Dummy variable taking a value of one a strategy that involves only a single add-on, and otherwise zero. Source: *Zephyr*.
	(8) Two	Dummy variable taking a value of one a strategy that involves a strategy with two add-ons, and otherwise zero. Source: *Zephyr*.
	(9) Three	Dummy variable taking a value of one a strategy that involves three add-ons, and otherwise zero. Source: *Zephyr*.
	(10) More	Dummy variable taking a value of one a strategy that involves more than three add-ons, and otherwise zero. Source: *Zephyr*.
Distance category	(11) Nearby	Dummy variable indicating strategies that involve an average distance, between the platform and the add-on(s), less than or equal to the 25th percentile of the sample, or a distance below 344 kilometer. Source: *CEPII.*
	(12) Close	Dummy variable indicating strategies that involve an average distance, between the platform and the add-on(s), between the 25th and 50th percentile of the sample, or a distance between 344 and 822 kilometer. Source: *CEPII.*
	(13) Far	Dummy variable indicating strategies that involve an average distance, between the platform and the add-on(s), between the 50th and 75th percentile of the sample, or a distance between 822 and 2,182 kilometer. Source: *CEPII.*

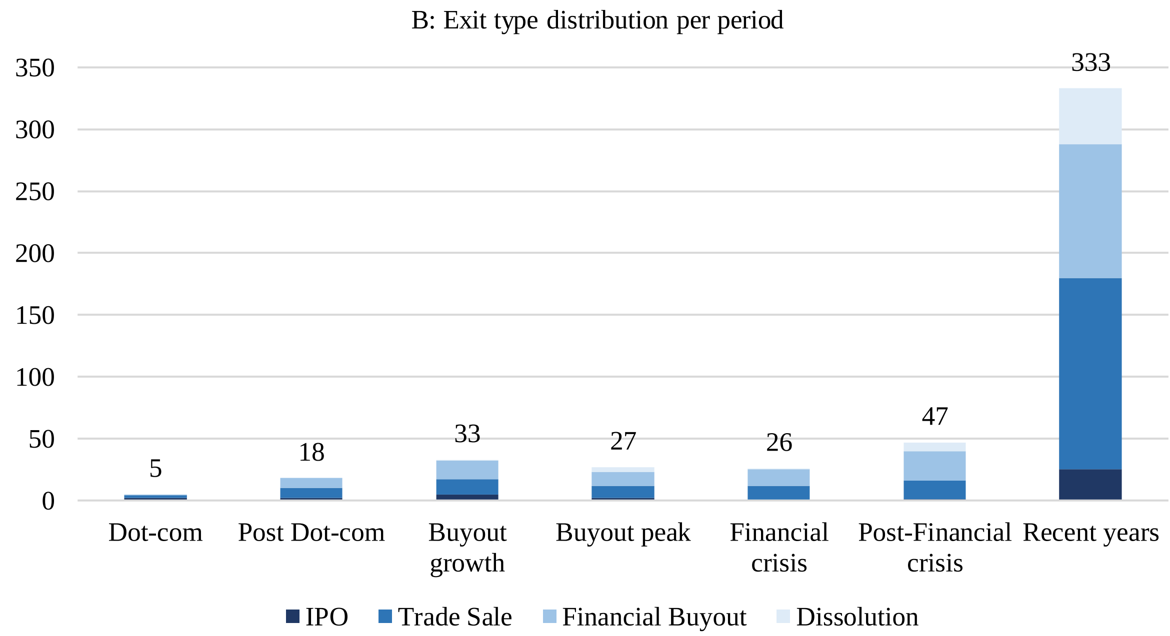
	(14) Furthest	Dummy variable indicating strategies that involve an average distance, between the platform and the add-on(s), larger than the 75th percentile of the sample, or larger than 2,182 kilometer. Source: *CEPII.*
Additional measures	(15) Rushed strategy	Dummy variable taking a value of one for strategies of which the average time between add-ons is faster than average, or less than 286 days, and otherwise zero. Source: *Zephyr*.
	(16) Rushed first add-on	Dummy variable taking a value of one for strategies of which the time between the acquisition and the first subsequent add-on belongs to the 25th percentile, or faster than 263 days, and otherwise zero. Source: *Zephyr*.
	(17) Investment Attractiveness	Dummy variable taking a value of one for strategies of which the average score of the investment attractiveness of the individual add-on countries is above average, or a sore higher than 10.72, and otherwise zero. It is a measure of the country's governmental attitude toward inward investment. Source: *ICRG.*
	(18) Institutional quality	Dummy variable taking a value of one for strategies of which the average score of the institutional quality of the individual add-on countries is above average, or a score higher than 16,32, and otherwise zero. The score is measured via three subcomponents of the International Country Risk Guide, following Bekaert et al. (2007). Namely Corruption, Law & Order, and Bureaucratic quality. Source: *ICRG.*
	(19) GDP	Dummy variable taking a value of one for strategies of which the average GDP per capita of the individual add-on countries is above average, or higher than 39,317.18 dollar, and otherwise zero. Source: *OECD and Worldbank.*
	(20) Hofstede	Dummy variable taking a value of one for strategies of which the average score of the Hofstede dimensions for the individual add-on countries is above average, or above a score of 55.92, and otherwise zero. Source: *Hofstede-insights.com.*
Deal characteristics	(21) Management participation	Dummy variable indicating whether the platform is acquired through management participation (MBO, MBI). Source: *Zephyr.*
	(22) Entry type:	
	Private	Dummy variable indicating the platform company has been acquired through a private-to-private transaction (1) or not (0). Whether the platform firm has been an independent private firm prior to the initial buyout. Source: *Zephyr, PE sponsor websites.*
	Public	Dummy variable indicating the platform company has been acquired through a public-to-private transaction (1) or not (0). Whether the platform firm was a publicly listed company prior to the initial buyout, i.e., the buyout is a going-private transaction. Source: *Zephyr, PE sponsor websites.*
	Divisional	Dummy variable indicating the platform company has been a corporate division or subsidiary prior to the initial buyout (1) or not (0). A so called 'spinoff' for example. Source: *Zephyr, PE sponsor websites*.
	Privatization	Dummy variable indicating the platform company has been a government-owned entity prior to the initial buyout (1) or not (0). Source: *Zephyr, PE sponsor websites.*
	Financial	Dummy variable indicating the platform company has been in the portfolio of another private equity investor prior to the initial buyout (1) or not (0). This includes secondary buyouts, tertiary buyouts, quaternary buyouts and quinary buyouts. Source: *Zephyr, PE sponsor websites.*
	Receivership	Dummy variable indicating the platform company has been acquired through a receivership transaction (1) or not (0). For example, through a liquidation. Source: *Zephyr, PE sponsor websites.*

	(23) Syndication	Dummy variable indicating whether there are more than one private equity sponsors backing the initial buyout of the platform firm (1) or only a single sponsor (0). Note: this thesis only considers PE backed transactions, therefore the 'zero' indicator for only one private equity sponsor can be used. Source: *Zephyr, PE sponsor websites.*
Firm characteristics	(24) PE experience	Dummy variable taking a value of one for private equity firms that have previous acquisition experience prior to the initial buyout of the platform firm and otherwise zero. Source: *Zephyr.*
	(25) PE total experience	The total number of completed (majority stake) acquisitions performed by the PE sponsor or the average in case of syndication prior to the initial buyout of the platform firm. Source: *Zephyr.*
	(26) PF experience	Dummy variable taking a value of one for platform firms that have previous acquisition experience prior to the initial buyout of the platform firm, and otherwise zero. Source: *Zephyr.*
	(27) PF total experience	The total number of completed (majority stake) acquisitions performed by the platform firm prior to the initial buyout. Source: *Zephyr.*
	(28) PF assets	The natural logarithm of the total amount of assets in millions USD of the platform firm one year prior to the year the platform firm is acquired by the PE sponsor. This can be thought of as a measure of relative firm size. Source: *(Historical version of) Orbis.*
Market characteristics	(29) IPO market	Dummy variable taking a value of one in case the number of IPOs in the year of the strategy exit is higher than the average of the three preceding years, as an indicator for Hot markets, and otherwise zero. Source: *Jay Ritter's IPO database (Link)*
	(30) M&A market	Dummy variable taking a value of one in case the number of worldwide M&A deals in the year of the strategy exit is higher than the average of the three preceding years, as an indicator for Hot markets, and otherwise zero. Source: *Institute for Mergers, Acquisitions, and Alliances (Link)*
Robustness test	(31) Diversifying	Dummy variable taking a value of one in case more than half of the add-on acquisitions is industry diversifying, and otherwise zero. Source: *Zephyr.*
	(32) Cross-border	Dummy variable taking a value of one in case more than half of the add-on acquisitions is cross-border, and otherwise zero. Source: *Zephyr.*

B: Sample characteristics

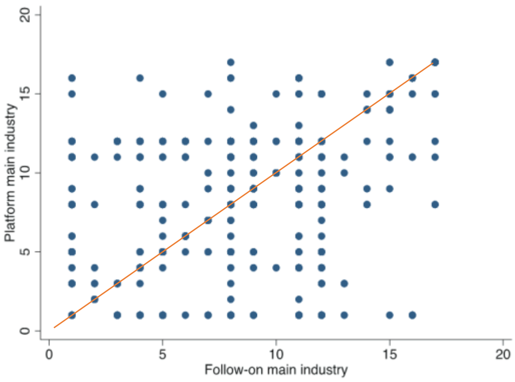
Figure 1: Distribution of exit-types per year and period



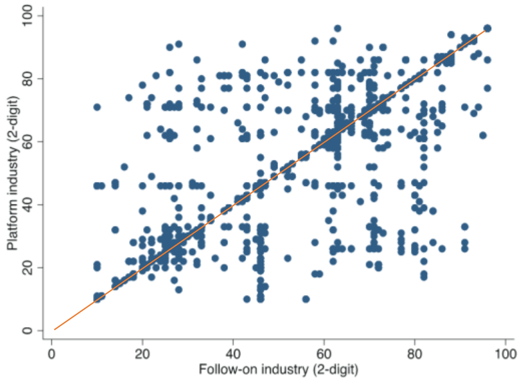


Panel A: The figure below presents the distribution of the types of exit per year during the sample period. Starting in 1997 until the fourth of August 2019.
Panel B: The figure below presents the different types of exit during the sample period, per period. The period distribution corresponds to the sample period distribution of Hammer et al. (2017). The main reason for the use of this period distribution is for the fixed effects inclusion in the survival analyses, resulting in model convergence.
Period distribution: 1997 – 2001: Dotcom; 2002 – 2004: Post-Dotcom; 2005 – 2006: Buyout growth; 2007 – 2008: Buyout peak; 2009 – 2010: Financial Crisis; 2011 – 2012: Post-Financial crisis; 2013 – present: Recent years.

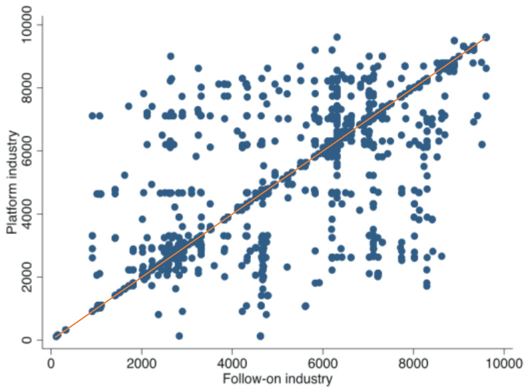
Figure 2: Sectoral patterns, platform industry



Panel A: NACE main sectors



Panel B: NACE 2-digit sectors

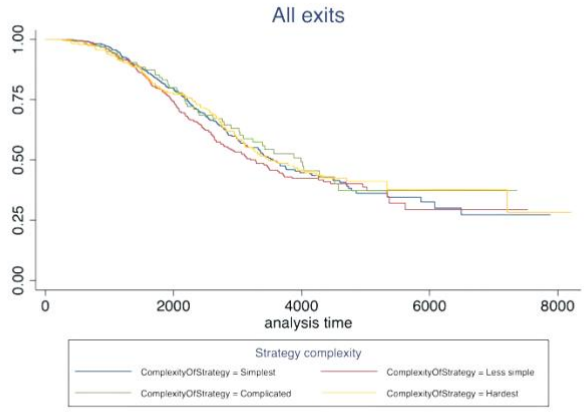


Panel C: NACE 4-digit sectors

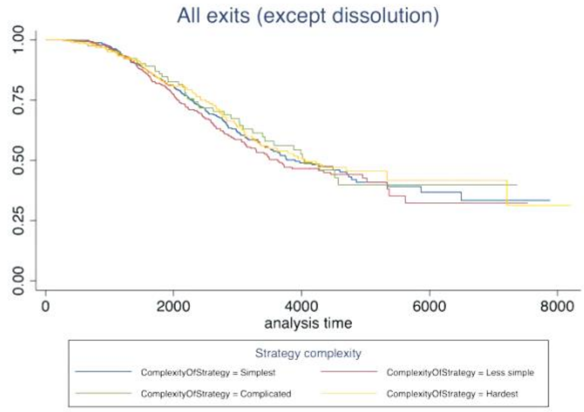
Figure 2 panel A – C plots the sectoral patterns of the sample. On the vertical axis the sector of the platform is plotted, while on the horizontal axis the sector of the add-ons is plotted. Panel A: the main sector based on a 1-digit Nace code is illustrated. Panel B: the main sector based on a 2-digit Nace code is shown. Panel C: pictures the main sector based on the 4-digit Nace code. The dots in the panels along the orange 45-degree line represent horizonal strategies, meaning the platform and the add-on are within the same industry. Whereas the other dots illustrate the strategies that involve industry diversifying acquisitions.

Figure 3: Survival curves per type of exit and complexity

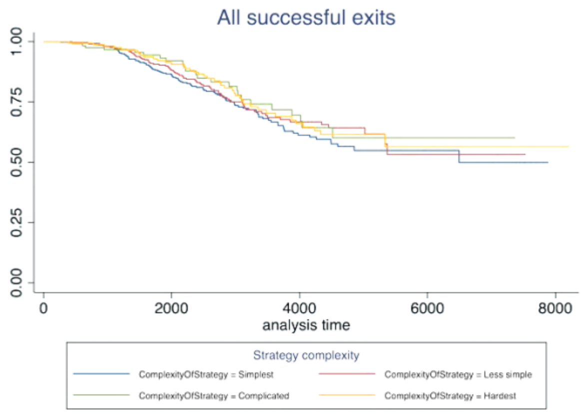
Panel A: All exits



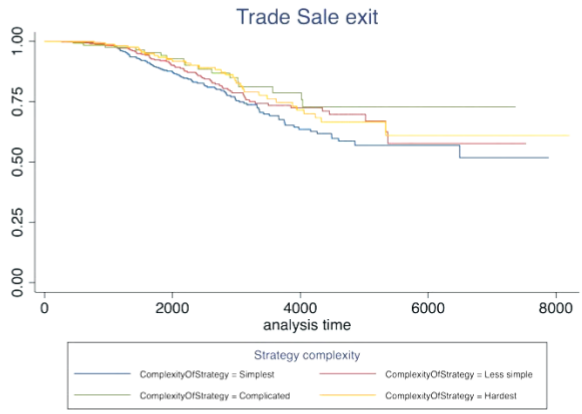
Panel B: All exits (except dissolution)



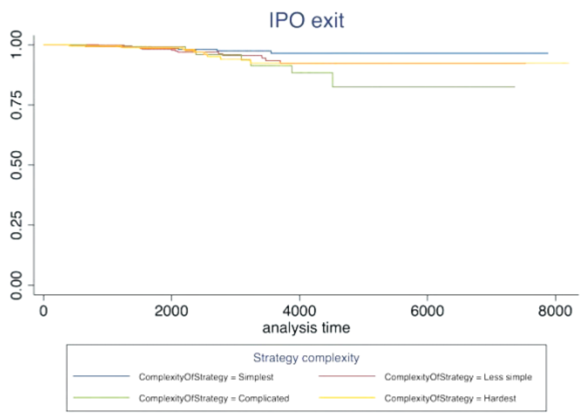
Panel C: All successful exits



Panel D: Tade sale



Panel E: IPO



Panel F: Financial buyout

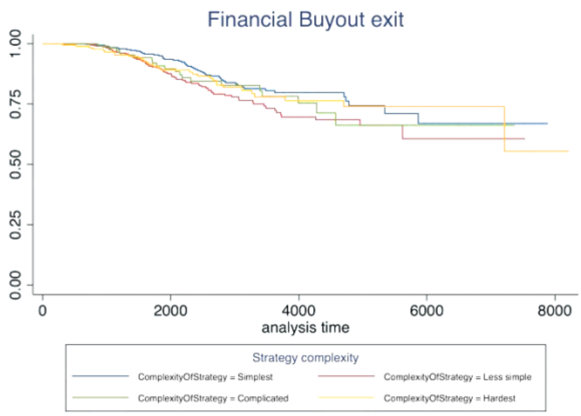


Figure 3 continues on the next page.

Panel G: Dissolution

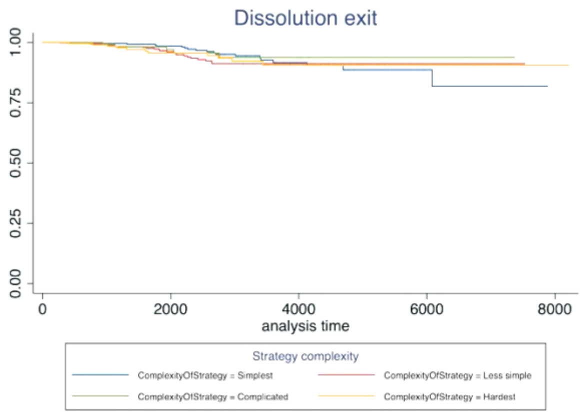
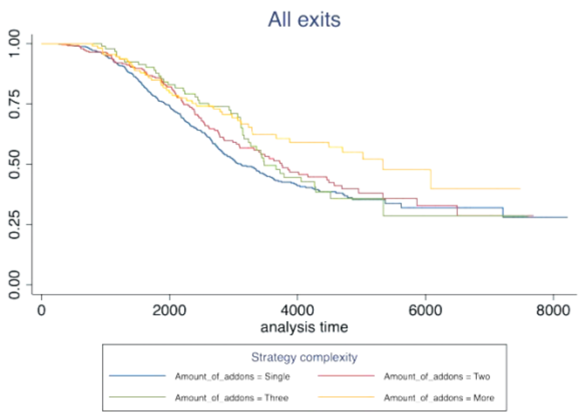


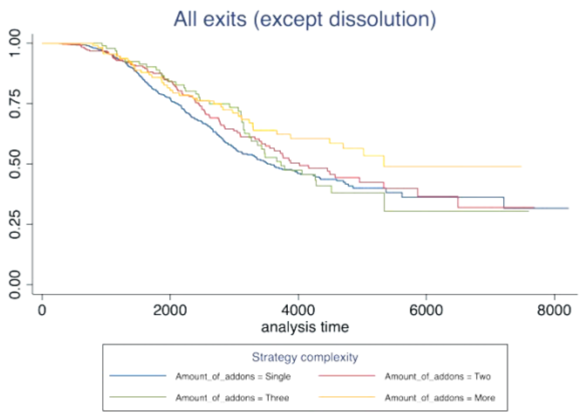
Figure 3 panel A – G illustrate the Kaplan-Meier survival curves for the degrees of strategy complexity and the type of exit.

Figure 4: Survival curves per type of exit and number of add-ons.

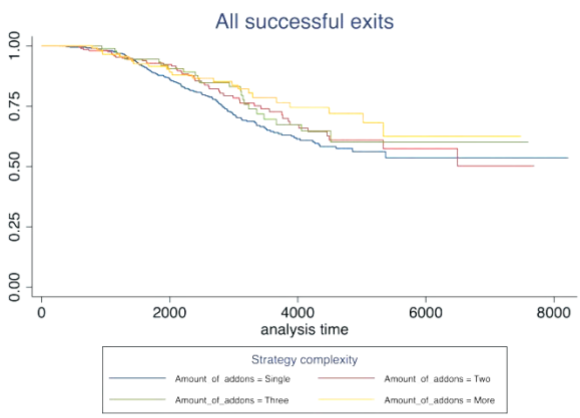
Panel A: All exits



Panel B: All exits (except dissolution)



Panel C: All successful



Panel D: Trade sale

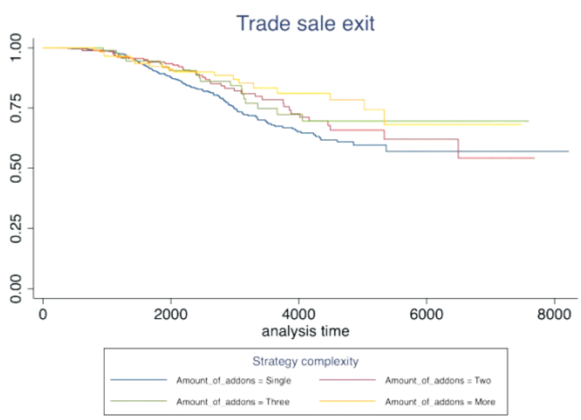
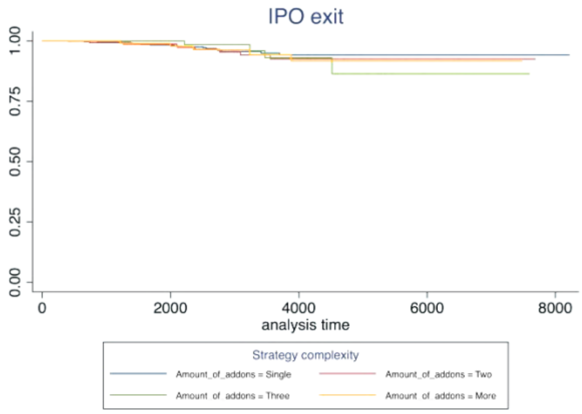
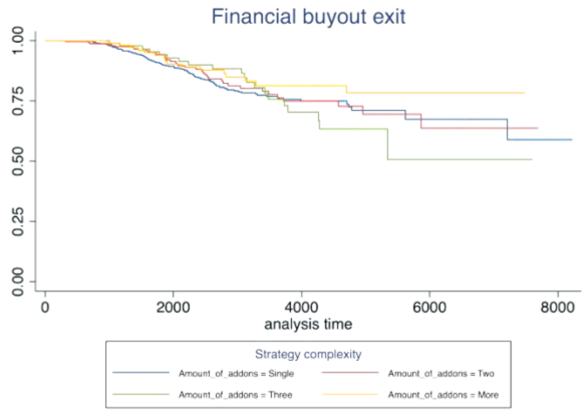


Figure 4 continues on the next page.

Panel E: IPO



Panel F: Financial buyout



Panel G: Dissolution

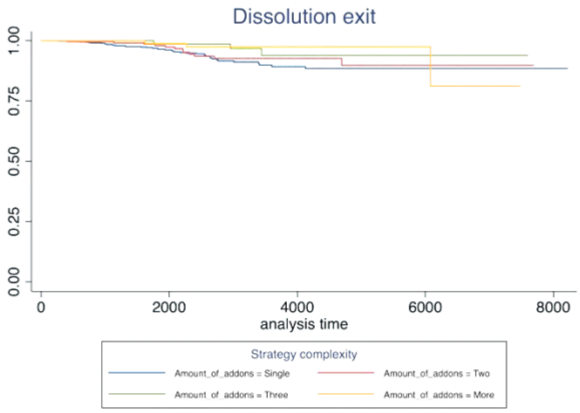
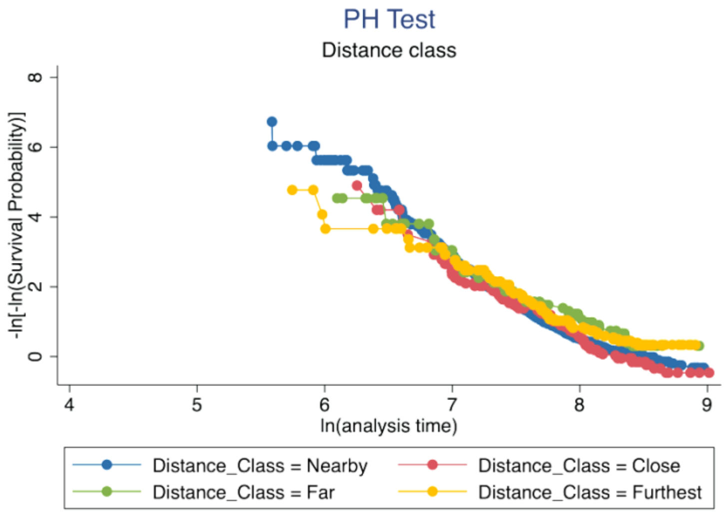


Figure 4 panel A – G illustrate the Kaplan-Meier survival curves for the number of add-ons and the type of exit.

Figure 5: Graphical tests for testing proportional hazard's assumption

Panel A: Graphical test of proportional hazard's assumption for 'Distance class'



Panel B: Graphical test of proportional hazard's assumption for 'Number of add-ons'

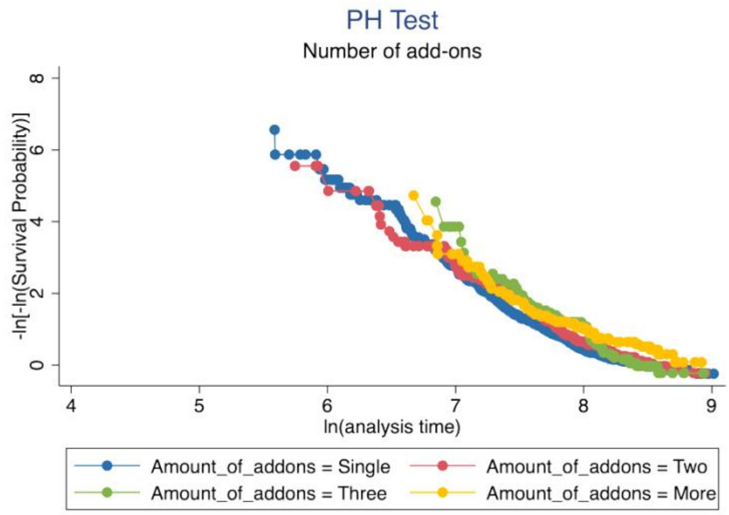
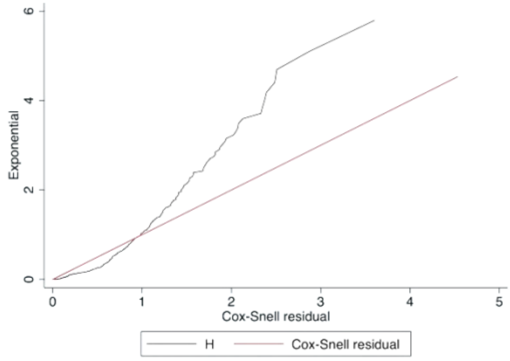


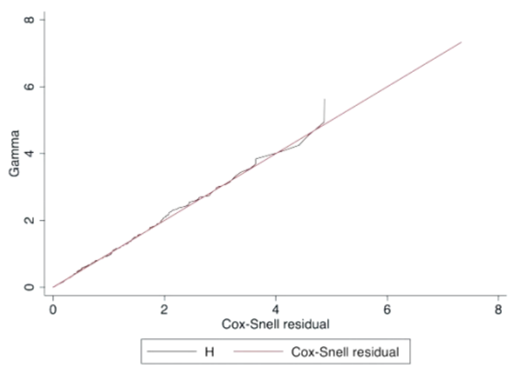
Figure 5 panel A and B illustrate the result of the graphical test for the proportional hazard's assumption. In case the assumption holds, the categorical variables should indicate parallel lines, though the lines should not be crossing. Furthermore, the proportional hazard's assumption is violated if at least one categorical variable indicates crossing lines. (Note: Amount_of_addons= number of add-ons)

Figure 6: Cox-Snell residual test for goodness of fit

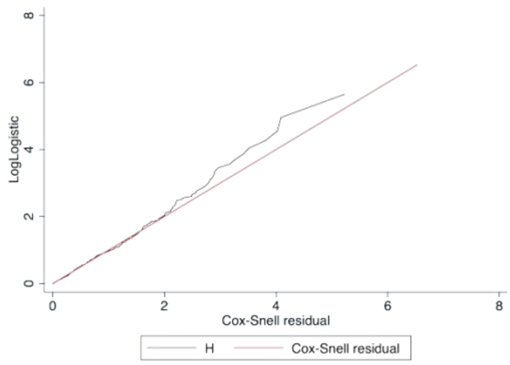
Panel A: Exponential distribution



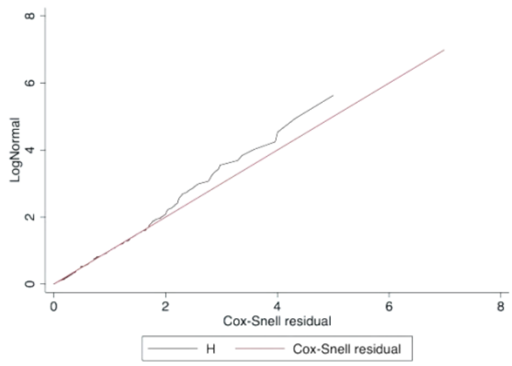
Panel B: Gamma distribution



Panel C: Log-Logistic distribution



Panel D: Log-Normal distribution



Panel E: Weibull distribution

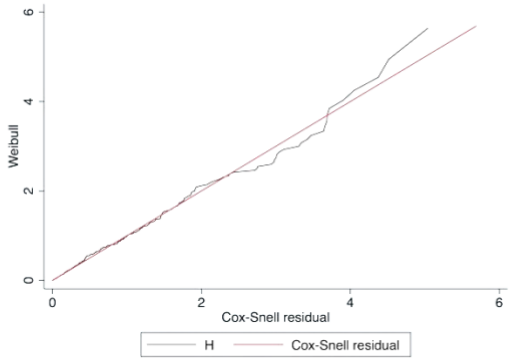


Figure 6 panel A – E plots the Cox-Snell residuals for the survival analyses distribution types. The analysis can be applied to any parametric model. The model that corresponds to the best goodness of fit, in terms of fitting the data, should illustrate residuals that are plotted exponentially. These graphs are created by plotting the cumulative hazard function, along with the benchmark line with a unit slope of one.

Table 1: Buy-and-build strategy characteristics and exit-types per year

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Exit-type			
Deal year	**Platforms/ strategies**	**%**	**Add-ons**	**%**	**Domestic**	**Cross-border**	**Industry penetrating**	**Industry diversifying**	IPO	Financial buyout	Trade sale	Dissolution
1997	4	0.3%	0	0.0%	0	0	0	0	0	2	1	0
1998	21	1.8%	4	0.2%	4	0	3	1	1	4	8	1
1999	26	2.2%	22	0.9%	15	7	10	12	4	10	3	2
2000	15	1.3%	27	1.1%	15	12	9	18	1	2	8	1
2001	16	1.3%	25	1.1%	16	9	14	11	0	2	6	0
2002	15	1.3%	9	0.4%	6	3	3	6	2	2	9	0
2003	32	2.7%	8	0.3%	7	1	6	2	1	20	2	0
2004	39	3.3%	24	1.0%	15	9	10	14	7	10	8	2
2005	66	5.5%	40	1.7%	28	12	16	24	1	11	21	4
2006	110	9.2%	55	2.3%	29	26	17	38	4	19	29	8
2007	95	7.9%	105	4.4%	73	32	50	55	4	23	28	4
2008	65	5.4%	132	5.6%	91	41	55	77	4	15	16	0
2009	37	3.1%	78	3.3%	63	15	42	36	3	11	10	0
2010	88	7.4%	119	5.0%	84	35	68	51	2	15	16	7
2011	89	7.4%	146	6.2%	110	36	67	79	1	12	19	8
2012	78	6.5%	168	7.1%	129	39	72	96	2	9	14	5
2013	65	5.4%	168	7.1%	134	34	78	90	0	3	9	6
2014	80	6.7%	193	8.2%	137	56	86	107	0	6	6	2
2015	68	5.7%	169	7.1%	122	47	84	85	0	3	0	3
2016	87	7.3%	199	8.4%	132	67	90	109	0	0	1	4
2017	57	4.8%	222	9.4%	154	68	87	135	0	1	0	1
2018	39	3.3%	274	1.6%	194	80	101	173	0	0	0	0
2019	5	0.4%	181	7.6%	131	50	82	99	0	0	0	0
Total	**1,197**	**100%**	**2,368**	**100%**	**1,689**	**679**	**1,050**	**1,318**	**37**	**180**	**214**	**58**

Table 1 presents the yearly distribution of the number of platforms and add-ons, their corresponding yearly percentage. Furthermore, in column 6 and 7 the number of yearly domestic and cross border add-on acquisitions is given, as well as the yearly number of industry penetrating and diversifying acquisitions in column 8 and 9. The last four columns under the 'Exit-type' headers indicates the yearly distribution of the exit types. In the bottom row of the table the total number of the columns is presented.

Table 2: Sample distribution of exit-types and duration per exit-type

(1) **Exit type**	(2) **Count**	(3) **%**	(4) **Average holding period in days (years)**
IPO	37	3.0%	2,224 (6.09)
Financial buyout	180	15.0%	2,197 (6.02)
Trade sale	214	17.9%	2,332 (6.39)
Dissolution	58	4.8%	2.058 (5.64)
Active	708	59.1%	2.733 (7.49)
Total	1,197		

Table 2 presents the total number of exits per exit-type, as well as their corresponding percentage. In the fourth column the average duration per type of exit is given, in number of days and the number of years in brackets.

Table 3: Buy and build strategy characteristics per industry

(1) Industry	(2) Platforms	(3)	(4) Add-ons	(5)	(6) Uncensored duration (days)	(7)	(8) Exit type	(9)	(10)
Accommodation and Food Service Activities	35	*2.9*	74	*3.1*	2,867	0	3	9	1
Administrative and Support Service Activities	102	*8.5*	166	*7.0*	2,551	1	15	14	8
Arts, Entertainment and Recreation	26	*2.17*	44	*1.9*	2,101	3	4	3	1
Construction	28	*2.3*	81	*3.4*	2,032	0	3	3	1
Education	17	*1.4*	19	*0.8*	2,196	2	1	3	0
Electricity, Gas, Steam, and AC supply	10	*0.8*	20	*0.8*	2,056	0	3	1	0
Financial and Insurance Activities	52	*4.3*	123	*5.2*	2,233	2	1	9	0
Human Health and Social Work Activities	84	*7.0*	316	*13.3*	2,192	5	13	20	4
Information and Communication	211	*17.6*	407	*17.2*	1,917	5	26	37	8
Manufacturing	333	*27.8*	474	*20.0*	2,316	5	57	60	17
Other Service Activities	11	*0.9*	37	*1.6*	2,283	2	3	2	1
Professional, Scientific, and Technical	102	*8.5*	245	*10.4*	2,057	4	19	20	8
Public Administration and Defense	2	*0.2*	5	*0.2*	-	0	0	0	0
Real Estate Activities	10	*0.8*	17	*0.7*	1,490	1	1	2	0
Transport and Storage	39	*3.3*	78	*3.3*	2,063	2	7	8	1
Water Supply	17	*1.4*	37	*1.6*	1,887	1	3	2	0
Wholesale and Retail Trade	118	*9.9*	225	*9.5*	2,576	4	21	21	8
Total	1,197		2,368			37	180	214	58

Table 3 describes the distribution of the number of platforms and add-on acquisitions per type of industry, based on the seventeen main Nace-industry codes. In column 3 and 5 the percentage of the platforms and the number of add-ons is given, respectively. Column 6 indicates the average duration of strategies per industry type that have exited, therefore uncensored duration. Columns 7 – 9 present the number of different exit types per industry, specifically: 7; IPO 8; financial buyout, 9; trade sale, 10; dissolution. In the bottom row the total number of the columns is presented.

Table 4: Follow-on acquisitions by strategy

(1) Number of add-ons	(2) Average strategy duration per # add-on (in days)	(3) Number of strategies	(4) %	(5) % Cumulative	(6) % Domestic	(7) % Penetrating
1	2,377	719	60.07%	60.07%	71.8%	43.8%
2	2,583	259	21.64%	81.70%	69.9%	41.3%
3	2,885	102	8.52%	90.23%	62.4%	46.4%
4	3,186	45	3.76%	93.98%	72,8%	41.7%
5	2,596	18	1.50%	95.49%	64.4%	27.8%
6	2,737	13	1.09%	96.57%	62.8%	28.2%
7	3,725	9	0.75%	97.33%	63.5%	34.9%
8	3,166	6	0.50%	97.83%	70.8%	43.8%
9	2,541	3	0.25%	98.08%	74.1%	33.3%
10	2,944	6	0.50%	98.58%	80.0%	50.0%
11	2,008	3	0.25%	98.83%	97.0%	60.6%
12	4,403	6	0.50%	99.33%	66.7%	73.6%
15	2,547	3	0.25%	99.58%	80,0%	73.3%
16	4,489	1	0.08%	99.67%	68.8%	68.8%
17	2,869	2	0.17%	99.83%	100.0%	91.2%
35	1,434	1	0.08%	99.92%	100.0%	71.4%
44	3,350	1	0.08%	100.00%	100.0%	4.5%
Total	-	1,197	-	100%	-	-
Total number of add-ons		2,368				
Average add-on per strategy		1.98				

Table 4 gives insight into the characteristics of the number of add-ons per platform firm and the corresponding B&B strategy. In column 1 the total number of add-ons is given that are present in the sample. Combining column 1 with column 3, the frequency of the different number of add-ons can be found. For example, there was only one strategy/platform that involved 44 add-ons, whereas there were 259 strategies with 2 add-ons. In column 4 and 5 the percentage and cumulative percentage of the number of strategies is given, respectively. In column 6 and 7 the percentage is presented regarding the number of add-ons that were domestic and industry penetrating per different number of add-ons. For example, strategies that involved a total number of 17 add-on acquisitions, all the acquisitions were in the same country as the platform firm, although 91.2 percent of the add-ons were industry penetrating.

Table 5: B&B strategy (platform) characteristics

Factor	Amount	%
Total number of strategies	1,197	-
Number of exited strategies	489	40.8%
Number of still active strategies	708	59.2%
Number of unsuccessful strategies	58	4.5%
Number of cross-border strategies	679	28.7%
Number of industry diversifying strategies	1,428	60.0%
Average strategy length (days)	2,532	-
Average length for one add-on (days)	1,843	-
Minimum length for exit (days)	267	-
Maximum length for exit (days)	7.210	-

Table 5 presents the key characteristics of the sample. The number of unsuccessful strategies involves only dissolved strategies. In the survival analysis tables, unsuccessful strategies involve also the financial buyout exits. The average strategy length indicates the average number of days for the censored and uncensored strategies in the sample. The average length for one add-on presents the average number of days that all the strategies would need for only one add-on.

Table 6: Strategies and exit-types per region

(1) Region	(2) Platforms	(3) Add-ons	(4) %	(6) IPO	(7) Financial buyout	(8) Trade sale	(9) Dissolution
Asia	0	8	*0.3*	0	0	5	0
Australia	0	9	*0.4*	0	1	4	0
Canada	0	19	*0.8*	0	4	9	0
Rest of Europe	143	265	*11.2*	2	16	24	9
Rest of world	0	17	*0.7*	0	2	3	0
Scandinavia	210	450	*19.0*	12	14	24	8
United Kingdom	480	890	*37.6*	19	71	52	21
United States	0	100	*4.2*	0	20	37	0
Western Europe	364	610	*25.8*	4	52	56	20
Total		2,368		37	180	214	58

Table 6 presents the sample characteristics per region. In the first column the different types of regions are presented. In column t and 3 the total number of platforms and add-ons is given per region. Since the study only considers the B&B strategy by platform firms within Europe, regions outside Europe indicate there are zero platform firms. In column 4 the percentage of the number of add-ons is given, with respect to the total number of strategies (2,368). In column 6 – 9, the distribution of exit types per region is presented. The regions are comprised in the following way. Asia: *Hong Kong, Japan, and Singapore*; Rest of Europe: *Austria, Switzerland, Spain. Hungary, Italy, Czech Republic, Cyprus, Poland, Romania, Slovenia, Slovakia, Ukraine, Lithuania, Serbia, and Portugal*; Western Europe: *Belgium, France, Netherlands, Luxembourg, and Germany*; United Kingdom: *England, Ireland, and Cayman Islands*; Rest of World: *Israel, Qatar, Russian Federation, Kuwait, Bahrain*; Scandinavia: *Denmark, Finland, Norway, Iceland, and Sweden.* Note: The variables relating to 'Distance category' are calculated according to the CEPII circle distance, irrespective of the region distribution.

Table 7: Distribution of degree of complexity and the number of add-ons

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Degree of complexity	**Single**	**Two**	**Three**	**More**	**Total**	**%**	**%**	**%**	**%**	**Uncensored duration (days)**
(1) Simplest	235	128	30	39	432	*54.4*	*29.6*	*6.9*	*9.0*	2,354
(2) Less simple	281	81	35	50	447	*69.9*	*18.1*	*7.8*	*11.2*	2,091
(3) Complicated	80	25	15	9	129	*62.0*	*19.4*	*11.6*	*7.0*	2,299
(4) Hardest	123	25	22	19	189	*65.1*	*13.2*	*11.6*	*10.1*	2,302
Total	719	259	102	117	1,197					
(6) %	*32.7*	*49.4*	*29.4*	*33.3*						
(7) %	*39.1*	*31.3*	*34.3*	*42.7*						
(8) %	*11.1*	*9.7*	*14.7*	*7.7*						
(9) %	*17.1*	*9.7*	*21.6*	*16.2*						

Table 7 presents the distribution of degrees in strategy complexity, the number of add-ons, and the uncensored average duration per complexity degree. Columns 2 – 5 present the total number of strategies per number of add-on. Column 6 shows the total frequency per degree of complexity, for example, of all the ‘Simplest’ strategies 235 were of the simplest type of complexity and had only one add-on. Columns 7 – 10 present the percentage of number of add-ons per different degree of complexity. For instance, according to column 9, 7.8 percent of the ‘Less simple’ strategies involved a total of three add-ons. Column 11 shows the average uncensored, meaning only exited strategies are counted for, duration per degree of complexity. Rows 6 – 9 present the percentage of the number of add-ons and the degree of complexity. For example. According to row 8 and column 3, 9.7 percent of the strategies that had two add-ons, followed a complicated strategy.

Table 8: Distribution of complexity degree and the variables measuring distance

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Degree of complexity	**Nearby**	**Close**	**Far**	**Furthest**	**Total**	**%**	**%**	**%**	**%**	**Uncensored duration (days)**
(1) Simplest	339	14	7	12	432	*78.5*	*3.2*	*1.6*	*2.8*	2,354
(2) Less simple	421	12	6	8	447	*94.2*	*2.7*	*1.3*	*1.8*	2,091
(3) Complicated	11	38	39	41	129	*8.5*	*29.5*	*30.2*	*31.8*	2,299
(4) Hardest	15	74	42	58	189	*7.9*	*39.2*	*22.2*	*30.7*	2,302
Total	846	138	94	119	1,197					
(6) %	*40.1*	*10.1*	*7.4*	*10.1*						
(7) %	*49.8*	*8.7*	*6.4*	*6.7*						
(8) %	*1.3*	*27.5*	*41.5*	*34.5*						
(9) %	*1.8*	*53.6*	*44.7*	*48.7*						

Table 8 presents the distribution of degrees in strategy complexity, the corresponding distance category, and the uncensored average duration per complexity degree. Columns 2 – 5 present the total number of strategies per different distance category. Column 6 shows the total frequency per degree of complexity, for example, of all the 'Simplest' strategies 7 were of the simplest type of complexity and had an average distance of 'Far'. Columns 7 – 10 present the percentage of the distance category per different degree of complexity. For instance, according to column 9, 30.2 percent of the 'Complicated' strategies involved an average distance of 'Far'. Column 11 shows the average uncensored, meaning only exited strategies are counted for, duration per degree of complexity. Rows 8 – 1 present the percentage of the number of add-ons and the degree of complexity. For example. According to row 8 and column 3, 27.5 percent of the strategies that had an average distance of 'Close', followed a complicated strategy.

Table 9: Distribution of variables measuring distance and the number of add-ons

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Distance category	**Single**	**Two**	**Three**	**More**	**Total**	**%**	**%**	**%**	**%**	**Uncensored duration (days)**
(1) Nearby	537	179	57	73	846	*63.5*	*21.2*	*6.7*	*8.6*	2,195
(2) Close	77	29	14	18	138	*55.8*	*21.0*	*10.1*	*13.0*	2,419
(3) Far	53	16	15	10	94	*56.4*	*17.0*	*16.0*	*10.6*	2,404
(4) Furthest	52	35	16	16	119	*43.7*	*29.4*	*13.4*	*13.4*	2,230
Total	719	259	102	117	1,197					
(6) %	*74.7*	*69.1*	*55.9*	*62.4*						
(7) %	*10.7*	*11.2*	*13.7*	*15.4*						
(8) %	*7.4*	*6.2*	*14.7*	*8.5*						
(9) %	*7.2*	*13.5*	*15.7*	*13.7*						

Table 9 presents the distribution of the distance categories, the number of add-ons, and the uncensored average duration per complexity degree. Columns 2 – 5 present frequency of the distance category per number of add-on category. Column 6 shows the total frequency per distance category, for example, of all the 'Furthest' strategies, 52 had only one add-on. Columns 7 – 10 present the percentage of number of add-ons per distance category. For instance, according to column 9, 10.1 percent of the 'Close' strategies involved a total of three add-ons. Column 11 shows the average uncensored, meaning only exited strategies are counted for, duration per degree of complexity. Rows 6 – 9 present the percentage of the number of add-ons and the distance category. For example. According to row 8 and column 4, 14.7 percent of the strategies that had three add-ons, had an average distance of 'Far'.

Table 10: Distribution of degree of complexity and the corresponding exit-type

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Degree of complexity	**IPO**	**Trade sale**	**Financial buyout**	**Dissolution**	**Total**	**%**	**%**	**%**	**%**	**Uncensored duration (days)**
(3) Simplest	8	95	53	19	175	*4.6*	*54.3*	*30.3*	*10.9*	2,354
(4) Less simple	14	69	76	23	182	*7.7*	*37.9*	*41.8*	*12.6*	2,091
(5) Complicated	7	17	20	5	49	*14.3*	*34.7*	*40.8*	*10.2*	2,299
(6) Hardest	8	33	31	11	83	*9.6*	*39.8*	*37.3*	*13.3*	2,302
Total	37	214	180	58	489					
(8) %	*21.6*	*44.4*	*29.4*	*32.8*						
(9) %	*37.8*	*32.2*	*42.2*	*39.7*						
(10) %	*18.9*	*7.9*	*11.1*	*8.6*						
(11) %	*21.6*	*15.4*	*17.2*	*19.0*						

Table 10 presents the distribution of the different types of strategy complexities, their corresponding exit-type, and the uncensored average duration per complexity type. Columns 2 – 5 present the total number of exits per exit type. Column 6 shows the total frequency per complexity type, for example, of all the strategies that have exited 175 were of the simplest type of complexity. Columns 7 – 10 present the percentage of the exit-type per different type of strategy complexity. For instance, according to column 9, 41.8 percent of the 'Less simple' strategies exited via a trade sale. Column 11 shows the average uncensored, meaning only exited strategies are counted for, duration per complexity type. Rows 8 – 11 present the percentage of the different types of exit and their complexity type. For example. According to row 10 and column 3, 7.9 percent of the strategies that have exited via a trade sale, followed a complicated strategy.

Table 11: Distribution of the number of add-ons and the corresponding exit-type

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Number of add-ons	**IPO**	**Trade sale**	**Financial buyout**	**dissolution**	**Total**	**%**	**%**	**%**	**%**	**Uncensored duration (days)**
(1) Single	19	136	106	40	301	*6,3*	*45.2*	*35.2*	*13.3*	2,106
(2) Two	9	41	38	12	100	*9,0*	*41.0*	*38.0*	*12.0*	2,369
(3) Three	4	19	20	3	46	*8,7*	*41.3*	*43.5*	*6.5*	2,689
(4) More	5	18	16	3	42	*11,9*	*42.9*	*38.1*	*7.1*	2,420
Total	37	214	180	58	489					
(6) %	*51.4*	*63.6*	*58.9*	*69.0*						
(7) %	*24.3*	*19.2*	*21.1*	*20.7*						
(8) %	*10.8*	*8.9*	*11.1*	*5.2*						
(9) %	*13.5*	*8.4*	*8.9*	*5.2*						

Table 11 presents the distribution of the number of add-ons, corresponding exit types, and the uncensored average duration per number of add-on category. Columns 2 – 5 present the frequency of the number of add-on category per exit type. Column 6 shows the total frequency per number of add-on category, for example, of all the strategies that acquired three add-ons, 20 strategies exited via a financial buyout. Columns 7 – 10 present the percentage of number of add-ons per exit type. For instance, according to column 9, 38.1 percent of the 'More' category exited via a financial buyout. Column 11 shows the average uncensored, meaning only exited strategies are counted for, duration per degree of complexity. Rows 6 – 9 present the percentage of the number of add-ons and the corresponding exit type. For example, according to row 6 and column 3, 63.3 percent of the strategies that exited via a trade sale, acquired a total of only one add-on.

Table 12: Distribution of the distance category and the corresponding exit-type

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Distance category	**IPO**	**Trade sale**	**Financial buyout**	**Dissolution**	**Total**	**%**	**%**	**%**	**%**	**Uncensored duration (days)**
(1) Nearby	21	161	123	43	348	*6.0*	*46.3*	*35.3*	*12.4*	2,195
(2) Close	8	33	20	7	68	*11.8*	*48.5*	*29.4*	*10.3*	2,419
(3) Far	3	9	13	4	29	*10.3*	*31.0*	*44.8*	*13.8*	2,404
(4) Furthest	5	11	24	4	44	*11.4*	*25.0*	*54.5*	*9.1*	2,230
Total	37	214	180	58	489					
(6) %	*56.8*	*75.2*	*68.3*	*74.1*						
(7) %	*21.6*	*15.4*	*11.1*	*121*						
(8) %	*8.1*	*4.2*	*7.2*	*6.9*						
(9) %	*13.5*	*5.1*	*13.3*	*6.9*						

Table 12 presents the distribution of the distance categories, the corresponding type of exit, and the uncensored average duration per complexity degree. Columns 2 – 5 present frequency of the distance category per exit type. Column 6 shows the total frequency per distance category, for example, of all the ‘Furthest’ strategies, 24 exited via a financial buyout. Columns 7 – 10 present the percentage of the type of exits per distance category. For instance, according to column 9, 46.3 percent of the ‘Nearby’ strategies involved exited via a trade sale. Column 11 shows the average uncensored, meaning only exited strategies are counted for, duration per degree of complexity. Rows 6 – 9 present the percentage of the exit types and the distance category. For example. According to row 6 and column 2, 56.8 percent of the strategies that had exited via an IPO, had an average distance of ‘Nearby’.

Table 13: AIC Test

Distribution	Log-likelihood	AIC
Cox PH	-1726.855	3,567.709
Exponential	-496.124	1,112.248
Gamma	-328.978	781.956
Log-Logistic	-328.312	778.624
Log-Normal	-333.726	789.4519
Weibull	-331.7091	785.418

Table 13 provides an overview of the results of the Akaike Information Criterion test. The distribution type with the lowest 'AIC' score offers the best model fit. According to the test with the Log-Likelihood, one should opt for the model with the highest outcome. The result of the AIC test is leading in any case.

Table 14: Summary characteristics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Complexity degree	1,197	2.063	1.047	1	4
Number of addons	1,197	1.680	0.988	1	4
Rushed strategy	1,197	0.104	0.306	0	1
Distance category	1,197	2.382	1.212	1	4
Rushed first addon	1,197	0.248	0.432	0	1
Investment attractiveness	1,197	0.579	0.494	0	1
Institutional quality	1,197	0.640	0.480	0	1
GDP	1,197	0.386	0.487	0	1
Hofstede	1,197	0.661	0.474	0	1
IPO market	1,197	0.212	0.409	0	1
M&A market	1,197	0.287	0.452	0	1
Entry type	1,197	2.313	1.052	1	6
Management Participation	1,197	0.108	0.310	0	1
Syndication	1,197	0.131	0.338	0	1
PE experience	1,197	0.173	0.378	0	1
PE experience total	1,197	3.280	11.49	0	124
PF experience	1,197	0.296	0.457	0	1
PF experience total	1,197	0.961	2.710	0	27
PF assets (log)	917	10.28	1.893	2.197	16.14
Region FE	1,197	3.789	2.327	1	9
Industry FE	1,197	9.368	4.163	1	17
Period FE	1,197	6.639	1.080	1	7

Table 14 presents the summary characteristics of the sample.

C: Survival analysis tables

Table 15: All Exits (AFT analysis)

VARIABLES	(1)	(2)	(3)
Complexity degree			
Less simple	-0.094*	-0.101*	-0.134**
	(0.054)	(0.054)	(0.058)
Complicated	-0.212*	-0.192*	-0.169
	(0.110)	(0.109)	(0.124)
Hardest	-0.123	-0.113	-0.041
	(0.103)	(0.102)	(0.112)
Number of add-ons			
Two	0.086	0.094	0.058
	(0.061)	(0.060)	(0.068)
Three	0.196**	0.203**	0.257***
	(0.086)	(0.085)	(0.098)
More	0.317***	0.326***	0.329***
	(0.087)	(0.087)	(0.095)
Rushed first add-on	-0.164***	-0.159***	-0.291***
	(0.056)	(0.056)	(0.061)
Distance category			
Close	0.018	-0.004	-0.040
	(0.100)	(0.099)	(0.111)
Far	0.322***	0.312***	0.126
	(0.125)	(0.123)	(0.133)
Furthest	0.282**	0.256**	0.092
	(0.118)	(0.117)	(0.125)
Rushed strategy	-0.246***	-0.249***	-0.194**
	(0.094)	(0.095)	(0.097)
Investment attractiveness	0.103*	0.115*	0.157**
	(0.057)	(0.063)	(0.070)
Institutional quality	-0.133**	-0.115*	0.096
	(0.063)	(0.057)	(0.066)
GDP	0.201***	0.223***	0.095
	(0.070)	(0.071)	(0.081)
Hofstede	0.177**	0.173**	0.080
	(0.069)	(0.069)	(0.076)
IPO market			-0.345***
			(0.061)
M&A market			-0.928***
			(0.063)
Controls	Reduced	Extended	Full
Region FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Period FE	Yes	Yes	Yes
Observations	1,197	1,197	917

Table 15 continues on the next page

Uncensored observations	489	489	343

This table provides the output of the log-logistic accelerated failure time model. The dependent variable is the natural logarithm of the censored and uncensored holding period. The events of interest are all the strategies that have experienced an exit. The coefficients should be interpreted as positive (negative) leading to a decelerating (accelerating) effect on the time to exit. The omitted variables are: 'Simplest' for the degree of complexity category; 'Single' for the number of add-ons; and 'Nearby' for the distance category. Standard errors are shown in parentheses. Statistical significance is shown at the 1% (***), 5% (**), and 10% (*) level

Table 16: Successful exits (AFT analysis)

VARIABLES	(1)	(2)	(3)
Complexity degree			
Less simple	0.028	0.022	0.035
	(0.071)	(0.071)	(0.074)
Complicated	-0.245*	-0.221	-0.312*
	(0.146)	(0.146)	(0.166)
Hardest	-0.099	-0.098	-0.089
	(0.135)	(0.135)	(0.141)
Number of add-ons			
Two	0.053	0.054	0.025
	(0.080)	(0.080)	(0.091)
Three	0.177	0.173	0.138
	(0.113)	(0.112)	(0.124)
More	0.204*	0.201*	0.079
	(0.113)	(0.113)	(0.119)
Rushed first add-on	-0.146**	-0.141*	-0.286***
	(0.074)	(0.074)	(0.082)
Distance category			
Close	0.024	0.018	0.135
	(0.129)	(0.131)	(0.141)
Far	0.468***	0.449**	0.304*
	(0.176)	(0.175)	(0.184)
Furthest	0.423***	0.409**	0.315*
	(0.164)	(0.163)	(0.175)
Rushed strategy	0.037	0.034	0.021
	(0.148)	(0.147)	(0.142)
Investment attractiveness	0.106	0.106	0.191**
	(0.074)	(0.074)	(0.086)
Institutional quality	-0.203**	-0.197**	-0.030
	(0.087)	(0.088)	(0.096)
GDP	0.354***	0.365***	0.264**
	(0.096)	(0.098)	(0.110)
Hofstede	0.146	0.138	-0.008
	(0.095)	(0.095)	(0.103)
IPO market			-0.236***
			(0.079)
M&A market			-1.008***
			(0.095)
Controls	Reduced	Extended	Full
Region FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Period FE	Yes	Yes	Yes
Observations	1,197	1,197	917
Uncensored observations	251	251	171

This table provides the output of the log-logistic accelerated failure time model. The dependent variable is the natural logarithm of the censored and uncensored holding period. The events of interest are strategies that have exited via an IPO or a trade sale. The coefficients should be interpreted as positive (negative) leading to a decelerating (accelerating) effect on the time to exit. The omitted variables are: 'Simplest' for the degree of complexity category; 'Single' for the number of add-ons; and 'Nearby' for the distance category. Standard errors are shown in parentheses. Statistical significance is shown at the 1% (***), 5% (**), and 10% (*) level.

Table 17: Trade Sale exit (AFT analysis)

VARIABLES	(1)	(2)	(3)
Complexity degree			
Less simple	0.087	0.075	0.062
	(0.078)	(0.077)	(0.080)
Complicated	-0.182	-0.136	-0.317*
	(0.161)	(0.161)	(0.186)
Hardest	-0.072	-0.052	-0.054
	(0.146)	(0.145)	(0.154)
Number of add-ons			
Two	0.057	0.056	-0.004
	(0.089)	(0.088)	(0.098)
Three	0.165	0.159	0.091
	(0.125)	(0.124)	(0.137)
More	0.177	0.179	0.042
	(0.126)	(0.126)	(0.129)
Rushed first add-on	-0.159*	-0.153*	-0.266***
	(0.081)	(0.081)	(0.091)
Distance category			
Close	0.073	0.034	0.083
	(0.139)	(0.141)	(0.151)
Far	0.527***	0.474**	0.403*
	(0.196)	(0.195)	(0.208)
Furthest	0.540***	0.518***	0.509**
	(0.189)	(0.187)	(0.212)
Rushed strategy	0.225	0.211	0.124
	(0.190)	(0.190)	(0.174)
Investment attractiveness	0.134	0.133	0.165*
	(0.083)	(0.082)	(0.093)
Institutional quality	-0.195**	-0.170*	0.014
	(0.096)	(0.096)	(0.103)
GDP	0.356***	0.393***	0.248**
	(0.108)	(0.109)	(0.121)
Hofstede	0.148	0.151	-0.060
	(0.105)	(0.106)	(0.116)
IPO market			-0.205**
			(0.086)
M&A market			-0.950***
			(0.100)
Controls	Reduced	Extended	Full
Region FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Period FE	Yes	Yes	Yes
Observations	1,197	1,197	917
Uncensored observations	214	214	148

This table provides the output of the log-logistic accelerated failure time model. The dependent variable is the natural logarithm of the censored and uncensored holding period. The events of interest are strategies that have exited via a trade sale. The coefficients should be interpreted as positive (negative) leading to a decelerating (accelerating) effect on the time to exit. The omitted variables are: ‘Simplest’ for the degree of complexity category; ‘Single’ for the number of add-ons; and ‘Nearby’ for the distance category. Standard errors are shown in parentheses. Statistical significance is shown at the 1% (***), 5% (**), and 10% (*) level.

Table 18: IPO exit (AFT analysis)

VARIABLES	(1)	(2)	(3)
Complexity degree			
Less simple	-0.235	-0.249	-0.458**
	(0.178)	(0.185)	(0.201)
Complicated	-0.429	-0.453	0.533
	(0.351)	(0.365)	(0.514)
Hardest	-0.080	-0.159	0.688
	(0.373)	(0.380)	(0.441)
Number of add-ons			
Two	0.025	0.039	0.561**
	(0.186)	(0.186)	(0.257)
Three	0.186	0.183	0.539**
	(0.245)	(0.252)	(0.256)
More	0.311	0.314	0.411
	(0.248)	(0.248)	(0.266)
Rushed first addon	-0.089	-0.065	-0.098
	(0.163)	(0.170)	(0.162)
Distance category			
Close	-0.352	-0.207	-0.431
	(0.350)	(0.369)	(0.474)
Far	-0.068	-0.036	-0.611
	(0.388)	(0.408)	(0.403)
Furthest	0.046	-0.015	-0.896*
	(0.363)	(0.366)	(0.475)
Rushed strategy	-0.459*	-0.392	-0.315
	(0.244)	(0.251)	(0.259)
Investment attractiveness	-0.031	-0.041	0.388*
	(0.172)	(0.173)	(0.200)
Institutional quality	-0.382	-0.409	-0.525*
	(0.252)	(0.250)	(0.302)
GDP	0.363*	0.314	0.100
	(0.213)	(0.222)	(0.234)
Hofstede	0.364*	0.246	0.032
	(0.220)	(0.221)	(0.204)
IPO market			0.014
			(0.163)
M&A market			-1.456***
			(0.327)
Controls	Reduced	Extended	Full
Region FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Period FE	Yes	Yes	Yes
Observations	1,197	1,197	917
Uncensored observations	37	37	23

This table provides the output of the log-logistic accelerated failure time model. The dependent variable is the natural logarithm of the censored and uncensored holding period. The events of interest are strategies that have exited via an IPO. The coefficients should be interpreted as positive (negative) leading to a decelerating (accelerating) effect on the time to exit. The omitted variables are: ‘Simplest’ for the degree of complexity category; ‘Single’ for the number of add-ons; and ‘Nearby’ for the distance category. Standard errors are shown in parentheses. Statistical significance is shown at the 1% (***), 5% (**), and 10% (*) level.

Table 19: Competing risks (AFT analysis)

VARIABLES	(1) Unsuccessful versus Successful	(2) IPO versus Trade Sale
Complexity degree		
Less simple	-0.207	-0.088
	(0.171)	(0.199)
Complicated	0.688	1.014**
	(0.427)	(0.521)
Hardest	0.248	0.065
	(0.307)	(0.318)
Number of add-ons		
Two	0.078	0.243
	(0.220)	(0.238)
Three	-0.066	-0.138
	(0.310)	(0.401)
More	0.165	-0.062
	(0.269)	(0.362)
Rushed first add-on	0.486**	0.637***
	(0.192)	(0.234)
Distance category		
Close	-0.374	-0.139
	(0.309)	(0.334)
Far	-0.658	-0.827
	(0.491)	(0.516)
Furthest	-0.689	-1.286**
	(0.448)	(0.634)
Rushed strategy	-0.455	-0.243
	(0.377)	(0.509)
Investment attractiveness	-0.317	-0.383
	(0.200)	(0.240)
Institutional quality	0.229	-0.085
	(0.209)	(0.233)
GDP	-0.676**	-0.465
	(0.273)	(0.297)
Hofstede	0.127	0.324
	(0.206)	(0.318)
IPO market	0.335	0.356
	(0.206)	(0.254)
M&A market	1.877***	1.990***
	(0.260)	(0.313)
Controls	Full	Full
Region FE	Yes	Yes
Industry FE	Yes	Yes
Period FE	Yes	Yes
Observations	917	917
Uncensored observations	343 (171 Successful, 172 Unsuccessful)	171 (23 IPO, 148 Trade Sale)

This table provides the output of the competing risks model. The dependent variable is the natural logarithm of the censored and uncensored holding period. The events of interest are in column one, strategies that have exited via an IPO or trade sale versus strategies that have exited via a financial buyout or a dissolution. In the second column the events of interest are strategies that have exited via an IPO or via a trade sale. The coefficients should be interpreted differently, compared to the coefficients of the AFT analysis. A positive coefficient favors the time to exit of the event of interest compared to the offsetting event. For example, the variable 'Complicated' in the second column indicates that it is more likely that strategies that follow this degree of complexity tend to exit via a trade sale, rather than via an IPO. The omitted variables are: 'Simplest' for the degree of complexity category; 'Single' for the number of add-ons; and 'Nearby' for the distance category. Standard errors are shown in parentheses. Statistical significance is shown at the 1% (***), 5% (**), and 10% (*) level.

Table 20: Hypotheses tests results

Hypotheses	**Test result**
Hypothesis 1a: *A relatively higher degree of complexity prolongs the duration of the B&B strategy*.	Rejected
Hypothesis 1b: *A relatively higher number of add-ons prolongs the duration of the B&B strategy*.	Accepted
Hypothesis 1c: *Strategies that involve relatively more distant acquisitions tend to prolong the duration of the B&B strategy.*	Accepted
Hypotheses 1d: *Strategies that are rushed will likely result in a prolonged duration of the B&B strategy.*	Rejected
Hypothesis 1e: *Country-specific factors of the add-ons are important drivers of the duration of the B&B strategy*.	Accepted
Hypothesis 2a: *Relatively more complex strategies tend to exit via an IPO or Trade Sale*.	Accepted
Hypothesis 2b: *A B&B strategy with a relatively higher number of add-ons is likely to exit via a trade sale or an IPO.*	Accepted
Hypothesis 2c: *The B&B strategy exit is dependent on the exit market conditions.*	Accepted

Table 20 provides an overview of the results of the hypotheses tests in this thesis.

Table 21: Likelihood ratio test

			Tested against Gamma distribution
Distribution	**No of parameters**	**Log-likelihood**	**Likelihood ratio**
Exponential	1	-496.124	334.29
Gamma	3	-328.978	-
Log-Logistic	2	-328.312	Not nested
Log-Normal	2	-333.726	9.50
Weibull	2	-331.7091	5.46

Table 21 provides an overview of the likelihood ratio test. Nested models are tested, this holds for the Exponential, Log-Normal, and Weibull distribution. The LR test is however not valid for comparing models that are not nested.

Table 22: Robustness test (AFT analysis)

VARIABLES	(1)	(2)	(3)
Strategy nature			
Diversifying	-0.010	-0.019	-0.064
	(0.049)	(0.049)	(0.054)
Cross-border	-0.024	-0.008	0.051
	(0.092)	(0.091)	(0.101)
Number of add-ons			
Two	0.108*	0.114*	0.083
	(0.062)	(0.061)	(0.067)
Three	0.196**	0.203**	0.253**
	(0.086)	(0.085)	(0.099)
More	0.326***	0.333***	0.331***
	(0.087)	(0.087)	(0.096)
Rushed first addon	-0.164***	-0.159***	-0.290***
	(0.056)	(0.056)	(0.062)
Distance category			
Close	-0.035	-0.055	-0.057
	(0.105)	(0.104)	(0.120)
Far	0.254**	0.245*	0.086
	(0.128)	(0.127)	(0.139)
Furthest	0.213*	0.188	0.036
	(0.123)	(0.122)	(0.135)
Rushed strategy	-0.230**	-0.233**	-0.188*
	(0.094)	(0.092)	(0.097)
Investment attractiveness	0.099*	0.092	0.162**
	(0.058)	(0.057)	(0.066)
Institutional quality	-0.137**	-0.120*	0.092
	(0.063)	(0.063)	(0.070)
GDP	0.198***	0.220***	0.077
	(0.071)	(0.072)	(0.082)
Hofstede	0.175**	0.169**	0.075
	(0.069)	(0.069)	(0.076)
IPO market			-0.343***
			(0.062)
M&A market			-0.927***
Controls	Reduced	Extended	Full
Region FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Period FE	Yes	Yes	Yes
Observations	1,197	1,197	917
Uncensored observations	489	489	343

This table provides the output of the log-logistic accelerated failure time model. The dependent variable is the natural logarithm of the censored and uncensored holding period. The events of interest are strategies that have experienced an exit. The coefficients should be interpreted as positive (negative) leading to a decelerating (accelerating) effect on the time to exit. The omitted variables are: 'Simplest' for the degree of complexity category; 'Single' for the number of add-ons; and 'Nearby' for the distance category. Standard errors are shown in parentheses. Statistical significance is shown at the 1% (***), 5% (**), and 10% (*) level.