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‘How to Buy in order to Build: Buy-and-build Strategy Value Drivers in the UK’

Name student: Max J. Steeman
Student ID number: 484836ms

Supervisor: Dyaran S. Bansraj
Second assessor: Dr. Vadym Volosovych

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How to Buy in order to Build?

Buy-and-Build Strategy Value Drivers in the UK

Max J. Steeman*

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Abstract

Using conditions that increase the occurrence of buy-and-build strategies, this paper aims to shed light on the performance drivers of these strategies in terms of the change in operating performance between acquisition and exit using a sample of 392 buy and build strategies in the United Kingdom. By means of Probit, duration, and Heckman models, this study tries to account for the bias that successful strategies are more likely to exit and that we only observe the performance of exited strategies This study finds that market fragmentation and valuation are positively related to strategy performance while the interest rate, the exchange rate and the strategy size are negatively related to strategy performance. These results support the idea that the conditions not only matter for the likelihood of the occurrence of a buy-and-build strategy but also to its potential performance as buy-and-build strategies perform the best in terms of improving operating performance under favourable company, industry and financing conditions.

Keywords: Buy-and-Build Strategy, Private Equity, Synergies

JEL Codes: L2, G24, G34

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1 Introduction

In a buy-and-build strategy, a private equity firm acquires a "platform"-company in order to build a solid base for subsequent "follow-on" acquisitions. Through exploiting synergies created by the combination of the firms, improving current operations, exercising high-leverage capital structure advantages and utilizing efficiency by way of concentrated ownership and high-powered incentives, these investment firms managed to construct a solid mechanism to create value and generate excess returns. The ability of private equity firms to exploit these value drivers depends on the initial conditions. While previous academics have studied the prevalence of buy-and-build strategies, this paper aims to empirically lay the bedrock for the conditions that increase performance of these buy-and-build strategies.

Outside of private equity, recent studies shed light on the (managerial) reasons for serial acquisitions (Croci and Petmezas, 2009), learning and hubris within serial acquisitions (Aktas, De Bodt & Roll, 2009, 2011) and the bidding and valuation within serial acquisition strategies. (Smit and Moraitis, 2010). Towards private equity, studies have examined the effect of buy-and-build strategies on liquidity (Hammer, 2016) or the valuation of portfolio companies (Hammer, Hinrichs and Schweizer, 2016), whether buy-and-build strategies actually create value (Bansraj et al., 2017; Chatterjee, 2009) and what the optimal conditions in the past have been for a firm to be a target in a buy-and-build strategy (Borell and Heger, 2013; Bansraj, 2019). Regarding the latter subject, do these prevalence conditions however also lead to the best results? The current body of literature still has a gap on what actually drives the performance of buy-and-build strategies. Hence, this paper aims to shed light on the performance drivers of buy-and-build-strategies. While it is rather challenging to determine these value drives due to all the dynamics in these strategies, this paper should provide the first insights on common success factors in buy-and-build strategies. More specifically, there are certain company, industry and financing conditions for which PE firms are more likely to start buy-and-build strategies and include certain companies. PE firms should pick the targets, select industries, and time their investments to increase the success of a strategy. This paper aims to empirically investigate whether these optimal conditions increase the operating performance of the companies of the strategies or whether these conditions are beneficial for the investors only and hence act in self-interest only. For example, some of these conditions that increase the likelihood that private equity firms select certain targets, industries or timing

of investments, may be done so in order for private equity firms to be able to exploit financing benefits et cetera, while these conditions are actually not beneficial for improvement of the operating performance of the companies. The question that this study aims to answer hence is; do the conditions that increase the likelihood that private equity investors start buy-and-build strategies also improve their operating performance? Not only is this relevant for future private equity investment decisions, private investors and institutionalised investors, it is an essential underpinning for academia with respect to explaining the dynamics within buy-and-build strategies as well as the alignment of interest between private equity firms and firm shareholders, employees and board members.

Using conditions that increase the prevalence of buy-and-build strategies, this paper empirically examines how they affect the strategy performance in terms of operating performance improvement i.e. the change in efficiency and profitability. By means of a sample consisting of 395 buy-and-build strategies in the UK with a total of 990 acquisitions, this paper finds that underperforming follow-ons that have a higher capacity utilization relative to the platform as well as market fragmentation, market valuation and market size are positively related with the strategy performance. Moreover, it finds the exchange rate and the strategy size are negatively related to strategy performance. To sum up, buy-and-build strategies perform the best in terms of improving operating performance under favourable company, industry and financing conditions. Hence, the conditions seem to matter not only for the likelihood of the occurrence of a buy-and-build strategy but also to its potential performance. Most of these results are consistent with the expectations based on previous studies. Nonetheless, this paper finds less evidence on the proposition that market uncertainty and favourable debt market conditions affect the operating performance of buy-and-build strategies. A concern for the these findings may arise because the decision to exit is likely to be related to the strategy performance up to that moment resulting in a selection bias of the strategies for which we observe the exit performance.[1] In order to minimize this, this paper assesses the decision to exit to the independent variables using probability and duration analyses. Moreover, it uses a Heckman selection model in order to account for the possible exit decision. In general, the previous results are found to be robust to this correction.

[1] Under several assumptions this is not too much of an issue if this bias is related to the dependent variable in the models and it only causes limited inferences. However, when this decision to exit is related to one of the independent variables in the models, this problem raises more concerns.

This study relates to three strands of literature; (1) the literature on the performance of private equity firms (e.g. Guo et al. (2011), Kaplan (1989), Kaplan and Schoar (2005), Kaplan and Weisbach (1992), Laamanen & Keil (2008), Loughran and Vijh (1997), Phalippou and Gottschalg (2008) and Ravenscraft and Scherer (1987)), (2) numerous studies on the value drivers in private equity (e.g. Barber and Goold (2007), Chang (1998), Fowler and Schmidt (1989), Fuller, Netter & Stegemoller (2002), Gorbenko Malenko (2014), Guo et al. (2011), Haleblian and Finkelstein (1999), Kaplan and Strömberg (2009), Kusewitt (1985), Laamanen & Keil (2008), Moeller et al (2004)), and (3) the literature on the occurrance conditions of buy-and-build strategies (e.g. Bansraj and Smit (2017), Borell & Heger (2013)). This study differs itself from previous literature by testing whether the company, industry and financing occurrence conditions for buy-and-build strategies proposed by the latter body of literature are beneficial for the improvement of operating performance of the strategies and hence can be added to the second body of literature on the value drivers of private equity and more specifically, buy-and-build strategies. This study thereby complements all three bodies of literature.

This paper is organised as follows; section 2 provides the theory for this study by discussing related literature. Section 3 presents the data, section 4 covers the methodology, and section 5 presents the results, provides robustness checks and discusses alternative explanations. Section 6 ends with the conclusions of this paper.

2 Theoretical Framework

As mentioned above, this study relates to three bodies of literature; (1) the literature on the performance of private equity firms, (2) numerous studies on the value drivers in private equity and (3) the literature on the optimal conditions of buy-and-build strategies. Based on these conditions, hypotheses will be formed in the latter subsection that will be tested throughout the paper.

2.1 Private Equity performance

In the past, many papers have assessed private equity performance from different perspectives. For example, Loughran and Vijh (1997), and Laamanen & Keil (2008) previously assessed private equity performance by looking at the (excess) market returns by adding

dividends back to the market value or assessing the stock when the exit route is an IPO. Stock returns, nonetheless, may be biased due to market trends, speculators, underpricing returns, as well as the fact that a selection bias may exist in private equity portfolio companies choosing an IPO as the exit route. Moreover, stock returns at the announcement date may not per se be telling much about the value of the acquisition but resembles more the markets reassessment of the bidder's business (Grinblatt and Titman, 2002).

Ravenscraft and Scherer (1987), Porter (1987) and Kaplan and Weisbach (1992) assess private equity performance in terms of divestitures. However, there still is a dispute on whether divestitures can be regarded as successful or not as there can be a gain or loss from the sell, which is also affected by market timing. Moreover, acquisitions could have failed to increase value and hence likely destroyed value. Furthermore, "acquirers often buy other companies only to sell them afterwards" (pg. 1, Kaplan and Weisbach, 1992) and that in the 80's divestitures made up more than 35% of the transactions (Kaplan and Weisbach, 1992)[2] which is in line with the current data as according to the annual Global Corporate Divestment Study by EY, 84% of the companies plan to divest within the next two years.

Private equity performance can also be assessed in terms of fund performance as done by e.g. Kaplan and Schoar (2005), Phalippou and Gottschalg (2008) and Harris et al. (2014). However, multiple buy-and-build strategies can be included in one fund. Hence, extracting the performance of a specific strategy from such a fund could provide substantial issues.

Performance can also be examined by making use of the entry and exit multiples or internal rates of return (e.g. Sarin, Das & Jagannathan (2002), Kooli, Kortas & L'her (2003) and Jenkinson, Morkoetter and Wetzer (2018)). However, it seems to be a rather subjective way of measuring performance because of e.g. multiple arbitrage, which is the practice of arbitraging the value at which the company is bought and sold by increasing the value (multiple) of the company without making any operational improvements. Such multiple expansion is possible if e.g. experienced PE sponsors are able to negotiate lower prices and use higher leverage ratio's to positively affect pricing (Achleitner et al., 2011). Moreover, data on these measures are often not available.

Another way to measure the success of these strategies is to look at operating performance as "value creation in private equity remains operations-driven" (pg. 1,

[2] Original statistic from W.T. Grimm's Mergerstat Review (1989).

Perembetov, Herger, Braun & Puche, 2014). Guo et al. (2011) observe operating performance of LBO's in terms of gains in (industry) adjusted net cash flows. Like Healy et al. (1992), Powell and Stark (2005) evaluate operating performance by means of operating cash flow and pre-depreciation profit.[3] Kaplan (1989) assesses the effect of private equity management buy-outs (MBO's) on the firm's operating performance in the three years thereafter and finds an increase in the operating performance of the firms mostly through reduced agency costs.

2.2 Private Equity Value Drivers

The second body of literature relates to the performance drivers within private equity. This body consist mostly of literature on LBO's and MBO's and less on serial acquisitions. Apart from market timing, private equity leveraged buy-outs manage to create value through concentrated ownership, high-powered PE firm incentives, lean efficient organisation with minimal overhead costs, performance-based managerial compensation highly leveraged capital structures, active governance (Kaplan and Strömberg, 2009) and lifted financial limitations. Chang (1998), Fuller, Netter & Stegemoller (2002) Moeller et al (2004), Laamanen & Keil (2008) and Gorbenko Malenko (2014) study acquisition specifics such as the type of bidder, type of payment, target/acquiror size and the difference in private and public companies. The findings suggest that cash payments enhance returns and cash constrained companies underperform, targets ought to be large enough. Moreover, strategic bidders typically value companies higher than financial bidders and attract other targets, and for stock offers, bidders in takeovers experience positive abnormal returns for private company targets and negative abnormal returns for public company targets.[4]

Numerous studies including Fowler and Schmidt (1989), Haleblian and Finkelstein (1999), Kusewitt (1985) and Laamanen and Keil (2008) have studied whether acquisitions experience affects takeover performance. The results, however, vary throughout different papers, where it is found to have a positive, a negative and a U-shaped relationship with

[3] For an extensive review of the literature on private equity performance, please see Cumming, Siegel & Wright (2007)

[4] Moreover, as private firms are closely held and the relative size of target to acquirers increases, the probability of blockholder formation increases when stock is used as the payment method increasing bidder value and returns. What is more, private firm owners may offer a discounted price when they are paid with stock instead of cash when tax deferral is a valuable option to avoid immediate tax implications (Fuller, Netter & Stegemoller, 2002).

performance. Above all, acquisition experience seems to affect takeover performance under certain conditions.[5]

Barber and Goold (2007) and Guo et al. (2011) study the use of debt as a driver of value and find that leverage operates through high-powered incentives, monitoring and tax shields. More to the aspect of the creation of synergies, Alcock (2013) finds that private equity manages to create value through reallocating capital to core and value adding units. Lastly, Laamanen & Keil (2008) study serial acquisitions and find that the rate of acquisitions and the variability in the rate of acquisitions are negatively related to excess market returns.

2.3 Optimal Conditions and Hypotheses Development

Several criteria and conditions exist that ex-post have increased the likelihood that firms were involved in a buy-and-build strategy. Investors carefully pick the right firms for their strategies for a reason. The papers by Borell and Heger (2013) and Bansraj and Smit (2017) examined these conditions and the mechanics on how they affected the likelihood of buy-and-build strategy occurrence in terms of selecting platforms, follow-ons, industries and financing conditions. These conditions can therefore be subdivided into three segments (1) industry conditions, (2) company conditions, and (3) financing conditions.

With respect to the company conditions, Borell and Heger (2013) suggest that funds create value by blending lower capacity utilization- and lower return platforms with higher utilization and return add-ons and thereby reallocating resources and capacity more efficiently. This would increase the firms with a lower capacity utilization to be selected as platforms in buy-and-build strategies and higher capacity utilized firms as follow-ons. Nonetheless, the reallocated resources and efficiency should be translated into a higher consolidated performance in the end and hence improve strategy performance. Moreover, Bansraj and Smit (2017) suggest that follow-ons are generally less efficient with respect to its rivals in order to be relatively cheap for the investors and entail room for improvement. The latter should also be translated into a higher strategy performance as the private equity should be able to 'flip' them. Furthermore, Bansraj and Smit (2017) suggest that follow-on options should be in the money, meaning that the add-ons should have a higher value to the platform

[5] Please review page 665 of Laamanen and Keil (2008) for an overview of the different studies and findings. The results of Laamanen and Keil (2008) are in line with Hayward (2002) that whether it is the acquisition experience effect on performance that is significant depends on the timing of the acquisitions.

combined than as a standalone. In other words, target options ought to be large enough in order to add value and provide synergistic value illustrated in figure A1 in the appendix.

Hypothesis 1. *Private equity firms select platforms and follow-on companies for buy-and-build strategies that increase the operating performance of consolidated strategies through the possibility of reallocation of resources and capacity utilization, acquiring improvable follow-ons and the opportunity to exploit synergies from acquiring more follow-ons which are sizeable for the platform to add value.*

When it comes to industry conditions, both Borell and Heger (2013) and Bansraj and Smit (2017) propose that the probability of the occurrence of a buy-and-build strategy is increased in the case of the availability of acquisition options and exit opportunities, measured by the industry fragmentation. This implies that buy-and-build strategies are more likely to occur in industries with more platform, follow-on acquisition options and exit options. While the availability of acquisition options increases the probability of acquiring a suitable target and hence improve operating performance, it is not expected that the availability of exit options increases the operating performance. It is only expected to increase profits from multiple arbitrage. Nevertheless, a more fragmented market should improve the operating performance at the exit through the availability of exit options, improving the market timing of the exit. Moreover, Bansraj and Smit (2017) suggest that within a 3-year window, market volatility negatively affects the probability of a buy-and-build strategy. This has to do with the uncertainty which withholds investors. Likewise, more stable markets should hence provide a solid base for the strategies to improve operating performance. Furthermore, Bernstein et al. (2017) shows that private equity investments are related to industries growing more quickly in which the investment occurred.

Hypothesis 2. *Private equity firms chose to start buy-and-build strategies in industries that are optimal for the improvement of the performance of the strategies through higher market fragmentation enabling the possibility of acquiring suitable targets and stable, growing and sizable markets facilitating the opportunity for both organic as well as inorganic growth.*

With respect to the financing conditions, Bansraj and Smit (2017) suggest that buy-and-build strategies arise more often when the market premium is high and the anticipation of high exit values through market valuation. While the operating strategy performance is not expected to be affected through the mechanism of exit values, a high anticipation of the market

through market valuation is also expected to be beneficial for the strategy throughout the period. Furthermore, beneficial financing conditions such as lower interest rates allow the investor to use higher ratios over leverage increasing the investment, number of add-ons or size of the buy-and-build strategies through aggressive investing (Axelson et al., 2013). Not only would this increase the probability of the occurrence of buy-and-build strategies through the availability of financial resources, the buy-and-build strategies that are performed should have less limited resources and hence more freedom to acquire the suitable platform and targets.

Hypothesis 3. *Private equity firms time their buy-and-build strategies optimally for the improvement of strategy operating performance through a higher market valuation, favourable debt market conditions and an advantageous country macroeconomic environment.*

3 Data

The data in this thesis can be subdivided into four parts: (1) the buy-and-and-build strategy sample, (2) the financial data of the companies, (3) the industry data and (4) the financing data. The data in this study comes from several sources. First of all, the transaction details of the buy-and-build strategies are retrieved from the Zephyr database, which focusses on deal information (Bureau van Dijk, 2020).[6] Secondly, financial data is retrieved from the Bureau van Dijk's Orbis database, which provides financial- and ownership comparable firm data on private firms (Bureau van Dijk, 2020). The deal information from Zephyr can be merged with the financial and ownership data from Orbis by a common Bureau van Dijk identification (BvD-ID) number. However, financial data for many firms within private firms is limitedly accessible. Hence, additional data had to be adjoined. For this reason, the geographical limitation for this research has been set to the UK only. This way, additional data would be more in the same standardized way for the different firms decreasing the possibility of a measurement error and increasing the simplicity of finding the additional data. The industry data is based on financials retrieved from Orbis and the financing data is retrieved from Datastream, Bloomberg and Fred.

[6] Zephyr is a database by Bureau van Dijk, a Moody's Analytics company (Moody's Corporation, 2017).

3.1 Deal Sample

Because complex structures regarding ownership and holding companies may complicate research within this field (Bansraj et al., 2019), this dataset is partly borrowed from the paper "Can Private Equity Funds Act as Strategic Buyers?" by Bansraj and Volosovych (2019).[7] As mentioned before, the deals and accompanying deal information is retrieved from the BvD Zephyr dataset. In the past, buy-and-build strategies have been given multiple labels, e.g. "leveraged build-up", "strategic rollup" and "consolidation play" (Hoffmann, 2008), but all these refer to the same phenomenon. In order to be consistent with the latest related literature regarding this study, this paper follows Smit (2001) which describes buy-and-build strategies as a PE firm acquiring a platform company with a plan to engage in follow-on acquisitions to leverage core capabilities or efficiencies. Such a strategy normally takes longer with a regular time span of five or more years instead of three.

To collect the add-on deals from Zephyr that are involved in buy-and-build strategies, the deals have to satisfy the criterion "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", which matches the definition used in the paper by Smit (2001). The deals only include majority stake acquisitions, the deal span ranges from 1997 to 2014 and only includes targets in Great Britain for the aforementioned financial data availability issues.

Because for this research complete strategies are required, platform acquisitions/companies should be added to the add-ons. While this seems rather straightforward at first glance, there are three issues regarding this task: (1) There is no label in the datasets assigning a company as a platform in a strategy, (2) the platforms cannot easily be assigned to all the follow-ons and (3) ownership structures with these strategies can be complicated when private equity firms, holdco's (holding companies), platforms and add-ons with multiple layers are involved. Bansraj and Volosovych (2019) overcame these problems by consulting multiple sources (including Orbis and PE websites), compiling this information and assigning the platforms to the follow-ons in order to define the strategies.[8] Using their strategy-

[7] Whilst this subsection initially provides direct support for repeatability, it also provides a solid base for replicability and reproducibility. More information can be found in Plesser (2018) which describes the three concepts and their use.

[8] For more information about the assembly of the strategy database, please consult Bansraj and Smit (2017).

linking-file which matches platforms and follow-ons, a dataset regarding buy-and-build strategies in the UK during the period of 1997 to 2014 was created.

Table 1 provides an overview of the deal sample in terms of acquisitions and exits by year. In total, the sample includes 990 acquisitions of which 598 are follow-on acquisitions which can be matched to 395 platforms (strategies). Of those 395 strategies, 255 are known to have exited by means of the availability of the exit deal information. This leaves us with 140 strategies that have been right censored. As can be seen, more acquisitions are included in the sample towards the end of the sample collection period (1997-2014). This has to do with the increase in popularity of buy-and-build strategies as well as the availability of data. The fact that the last two years from this dataset contain fewer strategies/platforms is that these might not have been added to the data sources yet as buy and build strategies. This downtrend is not shown in the number of follow-on acquisitions as these may be linked to earlier strategies, which seems logical because of the fact that there probably is a lag between platform and follow-on acquisitions. The table furthermore shows that during the beginning of the crisis, the number of platform acquisitions (strategies) drastically declined (31 in 2008 to 13 in 2009). The number of follow-on acquisitions during this year also experienced a slump, however not as severe as the number of platform acquisitions (a relative drop of 37.5% versus 58%). This may be due to the fact that PE firms were careful when it came to initiating new buy-and-build strategies, but took the opportunity on expanding their current strategies in times of relatively cheap targets. Moreover, dataset is in line with the common finding that mergers and acquisitions come in waves which can be due to economic, regulatory and technological shocks (Harford, 2005).

Table 1: Acquisitions and exits by year. This table provides an overview of the platform acquisition, follow-on acquisitions and exits over time. The sample collection period of buy-and-build strategies ranges from 1997 to 2014. The exits have been updated up to 2017.

	Platforms / Strategies		Follow-ons		Total Acquisitions		Exits	
Year	N	%	N	%	N	%	N	%
1997	2	0.51	0	0	2	0.2	0	0
1998	11	2.78	5	0.84	16	1.62	1	0.39
1999	18	4.56	16	2.68	34	3.43	1	0.39
2000	12	3.04	15	2.51	27	2.73	1	0.39
2001	9	2.28	13	2.17	22	2.22	2	0.78
2002	8	2.03	7	1.17	15	1.52	7	2.75
2003	10	2.53	4	0.67	14	1.41	7	2.75
2004	22	5.57	14	2.34	36	3.64	6	2.35
2005	28	7.09	17	2.84	45	4.55	8	3.14
2006	52	13.16	41	6.86	93	9.39	10	3.92
2007	36	9.11	58	9.7	94	9.49	10	3.92
2008	32	8.1	64	10.7	95	9.6	5	1.96
2009	13	3.29	40	6.69	53	5.35	6	2.35
2010	36	9.11	53	8.86	89	8.99	12	4.71
2011	43	10.89	58	9.7	101	10.2	14	5.49
2012	37	9.37	75	12.54	112	11.31	19	7.45
2013	17	4.3	61	10.2	77	7.78	26	10.2
2014	9	2.28	57	9.53	65	6.57	51	20
2015	0	0	0	0	0	0	27	10.59
2016	0	0	0	0	0	0	28	10.98
2017	0	0	0	0	0	0	14	5.49
Total	395	100	598	100	990	100	255	100

Table 2 reports the statistics on the strategy size and length in this sample. However, it is the case in some strategies, that follow-on acquisitions have occurred prior to the platform acquisition. If the length of the strategy would be defined by the first acquisition, either follow-on or platform, by the PE firm, the minimum length would be 44 days instead of 39 days. On average, a strategy includes 1.5 follow-on acquisitions but bigger strategies of 30+ follow-on acquisitions do exist within the sample. The shortest strategy of the sample was 39 days long and included only one follow on acquisition. The longest strategy nonetheless was 7153 days long (19+ years), also included only one follow-on acquisition and had not yet exited at the end of the sample period. The longest strategy with a known exit was 4881 days longs (13+ years). The average length of the exited strategies is 1926 days (around 5 years) which corresponds with the idea that buy-and-build strategies have a planning period of five or more years (Smit, 2001) in contrast to most private equity portfolio companies which are typically held around three years. Moreover, it shows that there is an exponentially decreasing link between the number of buy-and-build strategies in the number of follow-on acquisitions.

The table furthermore shows that the average length for the strategies for which no exit is known is substantially longer than for the strategies with a known exit. This raises the first concerns that the strategies for which an exit is not known are held longer for specific purposes instead of the fact that an exit is not known (yet) because the strategy started in a late stadium of the sample period and it is also not the case that these strategies are of a lower size in terms of the number of follow-on acquisitions. Sections 4.3.2 and 5.6 cover this issue more specifc.

Table 2: Number of follow-ons per strategy and their exits. This table shows the distribution of the strategy sizes in terms of follow-on acquisitions. The exited strategy length is computed as the exit date minus the platform acquisition date. The strategy length of non-exited strategies is determined as the last date contained in the dataset minus the platform acquisition date. These lengths are computed as the number of days.

	All Strategies					Exited		Not Exited	
Number of follow-ons	N#	%	Min length	Length (μ)	Max length	Length (μ)	N#	Length (μ)	N#
1	315	79.75	39	2336.49	7153	1918.19	205	3116.06	110
2	45	11.39	438	2337.02	4667	1926.52	29	3081.06	16
3	15	3.8	1108	2500.33	4588	1916.00	9	3376.83	6
4	10	2.53	1015	3407.50	4913	2205.67	3	3922.57	7
5	2	0.51	950	1425.00	1900	671.75	2	0.00	0
6	1	0.25	3116	3116.00	3116	3116.00	1	0.00	0
7	1	0.25	3046	3046.00	3046	3046.00	1	0.00	0
8	2	0.51	2420	2549.50	2679	2420.00	1	2679.00	1
10	1	0.25	1542	1542.00	1542	1542.00	1	0.00	0
11	1	0.25	1796	1796.00	1796	1796.00	1	0.00	0
19	1	0.25	2079	2079.00	2079	2079.00	1	0.00	0
33	1	0.25	1434	1434.00	1434	1434.00	1	0.00	0
Total	395		39	2363.81	7153	1926.44	255	3160.44	140
Average N# follow-ons	1.52						1.59		1.40

3.2 Financial Data

A main issue within academic research on buy-and-build strategies, or private equity in general is the lack of available data. Because buy-and-build strategies often concern small and private firms, which have little reporting requirements, it makes research within this area even more complicated. Moreover, private equity companies purposely reduce the reported information about buy-and-build strategies in order to prevent competition when it comes to possible new targets (Bansraj et al., 2019). Fortunately, the Orbis database provides substantial financial data for private firms involved with private equity investments. Nonetheless, not all data is available (e.g. for only 59% of the follow-ons in this dataset, the data on the total assets is available and only 41% of the operating profit data of the follow-ons is known). This might be due to a survivor bias in the dataset as well as a bias due to the reporting of private equity firms. The survivorship bias may exist if for example only the financial data for the larger firms in the dataset is known. Moreover, private equity firms might report less on underperforming firms as they have an incentive to advertise themselves with success stories.

Table 3 provides the descriptive statistics for financial data of the platforms and follow-ons at the time of the acquisition. The follow-ons are relatively underreported to the platforms when taking into account the fact that the dataset included 395 platforms and 598 follow-ons. As expected, in terms of assets and loans as well as the number of employees and changing items such as turnover, EBITDA and cash flow, platforms tend to be larger than follow-ons on average. Combined with the fact that the follow-ons are relatively underreported, this corresponds with the suspicions that a survivorship bias in terms of firm size exists. Moreover, follow-ons on average have a higher capacity utilization measured in terms of asset turnover (ATR) relative to platforms, which is in line with Borell and Heger (2013). Descriptive statistics on the dependent variables (change in operating performance of the strategies) can be found in table A3 in the appendix.

Table 3: Descriptive statistics for the financial data. This table shows the descriptive statistics for the financial data for the platforms and follow-ons at the time of the acquisition. Panel A provides the firm characteristics and panel B the operating performance measures. Total assets, turnover, cash, long-term debt, loans, EBIT, EBITDA, profit before tax, net income, interest paid and cash flow are measured in thousands. Capacity utilization is measured as turnover over assets.

	Platform					Follow-on				
	Obs.	Mean	S.D.	Min	Max	Obs.	Mean	S.D.	Min	Max
Panel A: Firm Characteristics										
Total Assets	301	171.12	653.03	0	9,995.00	353	40.78	181.28	0	2,703.57
Operating Profit	261	178.71	623.43	0	6,361.03	244	28.84	55.78	0	440.72
Employees	171	822.98	3,017.75	1	35,000	179	227.15	631.45	2	5,980
Cash	168	7.04	16.64	0	106.05	189	2.79	9.5	0	86.37
Long Term Debt	142	35.4	105.37	0	948.87	132	25.13	235.45	0	2,701.98
Loans	179	17.83	71.51	0	809.68	204	10.83	52.75	0	532.03
EBIT	256	4.27	57.8	-547.68	407	262	1.69	7.8	-27.34	82.09
Net Income	200	-0.39	43.5	-499.74	212	223	3.25	20.62	-29.35	267.01
Interest Paid	146	3.75	8.98	0	51.3	129	0.65	2.26	0	22.91
Cashflow	177	5.45	57.03	-493.62	509	196	3.63	19.99	-15.27	269.34
Panel B: Operating performance measures										
ATR (Capacity Utilization)	238	1.45	1.68	0	16.83	243	7.01	74.8	0	1,167.13
ROA (EBIT)	254	0.04	0.39	-3.37	1.71	261	0.65	9.58	-5.57	154.38
ROA (Net Income)	198	0.11	1.53	-3.47	20.48	223	0.05	0.65	-4.79	2.67
ROS (EBIT)	235	-2.55	28.44	-425.02	10.2	244	-0.13	1.73	-18.08	1
ROS (Net Income)	182	-1.8	25.33	-326.82	68	204	0.32	6.35	-18.08	86.93

3.3 Industries

When it comes to investigating industry conditions, this study makes use of the revised Statistical Classification of Economic Activities in the European Community, also referred to and hereafter; NACE.[9] the overview of the industries using the most general classification, the 1-digit code, can be found in table A4 (appendix)[10] The industry measures however are computed more narrowly on a 2-digit level.

Table 4 provides the descriptive statistics for the industry data. Market consolidation is measured with the Herfindahl Hirschman Index (HHI). The HHI is computed as in equation (1) where N is the total number of companies in the UK for a specific industry computed at the 2-digit NACE level. In order to measure for market fragmentation instead of consolidation, the HHI is inverted through dividing one by the HHI (as in Bansraj and Smit (2017)).[11] Panels A and B in table 4 show how this transformation looks in terms of values.

$$Herfindahl\text{-}Hirschman\ Index\ (HHI) = \sum_{i=1}^{N}\left(\frac{Sales_i}{\sum_{j=1}^{N} Sales_j}\right)^2 \quad (1)$$

An important insight that comes forward is the fact that the general measure for market consolidation (or fragmentation) resembles the market consolidation (fragmentation) for the top segment quite much. The same goes out for the market consolidation (fragmentation) for the mid segment and the bottom segment. Hence, these measures are likely to be correlated. Table A1 in the appendix supports this finding as the correlation between the logarithm of the general normalized inverted Herfindahl Hirschman Index and the top segment report a correlation value 0.999 significant at the 1% level. The bottom and mid segment report a correlation of 0.804. Hence, this might raise concerns regarding (perfect) multicollinearity. Figure A6 (Appendix) provides insights on the market size and growth for the 1-digit NACE code classified markets in the UK. As expected, the tail of the dataset (1997/1998) shows little availability. Moreover, some industries such as agriculture, forestry and fishing (0) show a relatively higher growth pattern over the period of 1997 to 2012 than others such as

[9] The NACE is essentially the European version of the ISIC. The industry conditions can be computed on a specific 4-digit industry classification but as this study does not include many observations and mostly looks at a broader more aggregate market condition, throughout analyses, the classification is loosened to a 2- or 1-digit code. Later analyses will also check for robustness using the SIC codes.

[10] A more specified list can be found on the website of the European Commission.

[11] See equation A1 in table A2 of the appendix.

construction but nothing seems out of the ordinary. Furthermore, the data in general shows an increase in the aggregate market, except for the decline during the great recession.

Table 4: Descriptive statistics for the industry data. This table shows the descriptive statistics for the industry data in the sample at the time of acquisition. Panel A shows the normalized Herfindahl Hirschman Indices which are a measure of market concentration. Panel B shows the logarithm of the inverted HHI's in order to measure market fragmentation. Panel C displays the other industry measures: market volatility measured as the standard deviation of market sales within 3 year moving window, annual percentual market growth and the logarithm of market size. All these measures are computed at the 2-digit NACE level. The top segment is the top 10%, the bottom segment the lower half and the mid segment the range in between.

	Obs	Mean	Std. Dev.	Min	Max
Panel A: Herfindahl Hirschman Indices					
HHI	384	0.05	0.07	0.00	0.50
HHI top	384	0.05	0.07	0.00	0.50
HHI mid	384	0.00	0.01	0.00	0.11
HHI bottom	384	0.01	0.03	0.00	0.33
Panel B: Inverted Herfindahl Hirschman Indices					
Inv. HHI (ln)	384	3.65	1.06	0.70	6.94
Inv. HHI top (ln)	384	3.62	1.05	0.69	6.68
Inv. HHI mid (ln)	384	6.77	1.69	2.24	11.82
Inv. HHI bottom (ln)	384	6.24	1.74	1.12	9.94
Panel C: Other industry measures					
Market Volatility	366	26.50	58.81	0.05	437.19
Market Growth (%)	382	0.22	1.49	-0.92	27.65
Market Size (ln)	384	24.78	1.63	19.75	27.76

Whilst this paper looks at market size, market growth and market concentration on a narrower view using 2- and 4-digit NACE code's, figure A6 and A7 (appendix) provide graphical insights by aggregating the markets to the 1-digit codes. This study has constructed industry specific market sizes, growth rates and concentrations by manually extracting company financials for every UK company in the Orbis dataset.[12] However, this also brings some issues along with it. First of all, the head and tail of the dataset (in a time perspective)

[12] As the Orbis dataset can only process the financials <10,000 companies per batch and there are more than 14,000,000 companies in the Orbis dataset for the UK, this is an immensely time consuming and labour-intensive process. Next, these batches had to be combined and the financials had to be aggregated on multiple levels (1-4 digit NACE codes) in order to compute these conditions.

are probably not very reliable due to the lack of data availability. This is because e.g. the latest data has a probability of not being reported yet. Moreover, there is a probability of two types of survivorship bias in this method. Firstly, the Orbis dataset might not include the smaller companies and secondly, the small companies that are included in the dataset often do not report the financials. Hence the industry conditions are biased towards the bigger companies in the UK. Figure A7 (appendix) presents the market concentration throughout the time period of the platform acquisitions for the 1-digit NACE level of industries. Two interesting aspect about these statistics come forward. First of all, the level of market concentration is substantially higher in the industries "agriculture, forestry and fishing" and "manufacturing, mining and quarrying and other industry", where this high level of market concentration for the latter is only shown after the financial crisis of 2008 which is probably due to consolidation and bankruptcy of prior market competitors. Moreover, the "agriculture, forestry and fishing" industry experiences a substantial decrease in the level of market concentration after 2005. The rest of the industries have a rather constant level of market concentration throughout the time period. These higher levels of market concentration as well as jumps in market concentration have not been corrected as they are not measurement errors but represent actual changes and higher levels of market concentration. Such variety in the data should have its effect on the mechanics of buy-and-build that affect strategy performance and thus should not be corrected.

As mentioned before, in the past mergers have occurred in waves, which could be characterized or pushed by industry patterns in combinations with economic circumstances. E.g. the merger wave of circa 1898 to circa 1902 followed a period of rapid general economic expansion and certainly in several sectors (O'Brien, 1988) and was characterized by "the simultaneous consolidation of producers within industries, thus qualifying for the description "horizontal consolidation"" (Sudarsanam, 2003, p. 14). The third merger wave of the 1960's, also known as the conglomerate merger wave (Hubbard and Palia, 1999), consisted mainly of "unrelated mergers, aimed at achieving growth through diversification into new product markets" (Sudarsanam, 2003, p. 15), which can be seen as vertical mergers. Whilst one may expect that buy-and-build strategy acquisitions occur in the same industry to increase market power, achieve economies of scale and for the best fit between the companies, it is interesting to see if perhaps some of these acquisitions involve the suppliers or customers of the platform or follow-on and to check if the industry conditions and fixed effects are applicable to

platforms only. In other words, whether there is an acquisition along the supply chain. Figure A2 (appendix) describes the distribution of the industry combinations between the platform and follow-on and the platform and exit respectively. The figure shows that about half (48.01%) of the follow-on acquisitions take place in the same 4-digit sector category as the platform. Most of the other follow-on acquisitions are dispersed to closely related sector categories. So while it frequently happens that the industries are closely related or the same, there still seems to be enough dispersion to suggest that private equity firms have other goals besides achieving economies of scope and increasing market power. When it comes to the platform companies of strategies exiting into other sectors, it happens more often than expected. However, these exit sectors are most of the time closely related to the platform sector. Mind that, whilst the figure insinuates that the proportion of different sector combinations is rather small relatively to the same sector combinations, many observations are stacked and actually 54.18% of the strategies exit in a different sector than the platform acquisitions. Of course, one should keep in mind that companies could be classified into multiple sector codes and that for the platform acquisition, a different code was selected than for the exit. Nonetheless, the figure provides support for the use of industry fixed effects based on the 1-digit NACE level of the platform at the time of the acquisition as most follow-ons are closely related and platforms often do not switch sectors.[13]

[13] Figure A3 in the appendix provides more insights on the frequency of horizontal and vertical acquisitions and the sectors in which these acquisitions occur.

3.4 Financing Conditions

This section briefly covers the financing conditions throughout the sample period in the United Kingdom. Daily, monthly, quarterly and yearly data on the financing conditions in the UK have been gathered through the sources Datastream, Bloomberg and FRED. Whilst some data may have been gathered through one of these sources, it could be that they actually have been provided by other sources such as the ICE Euro High Yield Index being provided by Bank of America Merrill Lynch (Bansraj and Smit, 2017). Figure A4 and A5 (appendix)[14] give a brief overview of the financing conditions used in this study: the exchange rate, inflation rate, spread and GDP growth and the FTSE (350) index. The Exchange rate is on the basis of GBP to USD computed on a daily level. The inflation rate is measured using the Consumer Price Index. The LIBOR in this sample is the three-month London Interbank Offered Rate and the High Yield is measured as the BofA Euro ICE High Yield Index. Both are computed on a daily basis. The spread is calculated as the difference between the High Yield and the LIBOR and is illustrated by the dark grey area in panel C of Figure A5 (appendix). The GDP growth has been computed as the quarterly percentual GDP growth for the UK in this sample and has been visualized relative to the actual GDP in panel D.

[14] This figure has been moved to the appendix for brevity reasons.

The FTSE 350 Index and the FTSE UK Index are used as the proxy for the public market valuation per sector and have been collected through Datastream. The difference between the two being that the FTSE UK Index is used as a more general classification of the industries whilst the FTSE 350 Index is used on a subclassification level.[15] As the firms in this sample cannot be directly matched to either the FTSE 350 indices of the FTSE UK indices, these had to be manually matched to these indices based on their descriptions. Especially for the subclassification FTSE 350 Index, this was time consuming undertaking. The result can be found in the linking table A5 (appendix). The paths that lead to these links can be found in table A6 (appendix). Figure A4 (appendix) shows that most industries show the same trend over time: gradual growth over time with a dip around the economic crisis of 2008. Only the subindustries personal goods, mining and industrial metals show deviating trends after 2005.

4 Methodology

4.1 Methodology

This paper tries to uncover whether the conditions that increase the likelihood that private equity investors start buy-and-build strategies also improve their operating performance. It does so by means of an Ordinary Least Squares (OLD) estimates model. In order to do this, first, the measure of performance of these strategies needs to be set. Because buy-and-build strategies differ from each other in the sense of the amount of acquisitions as well as the type of acquisitions, the performance of these strategies cannot be compared using absolute values such as profit, EBITDA or cash flow. To illustrate this with purely fictional figures; let us take a platform which makes $100m revenue. Acquiring a firm with $80m revenue may result in $200m revenue, where $100m revenue originates from the platform, $80m revenue from the follow-on and $20m from the created synergies. Comparing this to a platform with $100m revenue acquiring a follow-on with a revenue stream of $20m which would result in a $10m extra revenue due to synergies, would wrongly classify the first strategy as a better one. Solely given the fact that the total revenue at the end of the road in an absolute sense is higher than the other doesn't tell us about the performance of the strategy. In order to do this, performance has to be evaluated in ratio's and growth rates. The main measure of performance of strategy

[15] The FTSE UK Index replaces the general FTSE 350 index since the university did not have a subscription for the general FTSE 350 Indices.

'j' is specified in equation (2) and is the difference between the Return over Assets (ROA), by accumulating the earnings before interest and taxes (EBIT) for the platform and follow-ons, at the time of the acquisition and exit. Here, time of the acquisition is relative.[16] Platform companies and follow-ons may be acquired in different years. Thus, the dealyear for platforms and follow-ons in the same strategy may differ, but the financials are taken for the specific firm, whether it is a platform or follow-on, in the specific year it was acquired and included in the strategy.

$$\Delta ROA_j = \frac{EBIT_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(EBIT_{t=exit}^{F_{ij}}\right)}{Assets_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=exit}^{F_{ij}}\right)} - \frac{EBIT_{t=0}^{P_j} + \sum_{i=1}^{N}\left(EBIT_{t=0}^{F_{ij}}\right)}{Assets_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=0}^{F_{ij}}\right)} \quad (2)$$

Where 'P' denotes a platform from strategy 'j' and 'F' denote follow-ons $i = 1, \dots, n$ of strategy 'j'. An important note must be made on the accumulation of the EBIT and assets for the follow-ons and platforms. Because relative measures could be skewed as a result of the lack of data availability during acquisition or exit moments, firms have only been included in a strategy's accumulated ROA if the EBIT and assets for both the time of acquisition as well as the time of exit are available. Throughout multiple analyses these performance measures will be interchanged with return on sales (ROS) and asset turnover (ATR) to check how these results hold under other measures of strategy performance illustrated in equations (3) and (4).[17,18] These operating performance measures have been winsorized at the 1st and 99th percentiles.

$$\Delta ROS_j = \frac{EBIT_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(EBIT_{t=exit}^{F_{ij}}\right)}{Turnover_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(Turnover_{t=exit}^{F_{ij}}\right)} - \frac{EBIT_{t=0}^{P_j} + \sum_{i=1}^{N}\left(EBIT_{t=0}^{F_{ij}}\right)}{Turnover_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Turnover_{t=0}^{F_{ij}}\right)} \quad (3)$$

[16] Unfortunately, these time inconsistencies are likely to affect the possibility to 'flip' companies.

[17] Throughout the main analyses, the ROA and ROS are computed using the EBIT because it retains the most data availability. Robustness checks will be performed to check whether the results hold if the EBIT is interchanged for the EBITDA, net income or profit before tax.

[18] For these measures, the same rule holds as for the ROA that firms have only been included in a strategy's accumulated ROS or ATR if the EBIT and turnover or the turnover and assets, respectively, for both the time of acquisition as well as the time of exit are available.

$$\Delta SOA_j = \frac{Turnover_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(Turnover_{t=exit}^{F_{ij}}\right)}{Assets_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=exit}^{F_{ij}}\right)} - \frac{Turnover_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Turnover_{t=0}^{F_{ij}}\right)}{Assets_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=0}^{F_{ij}}\right)} \quad (4)$$

Then, there is another controversy when it comes to assessing buy-and-build strategies. The reallocation of resources, which enables value creation according to Borell and Heger (2013), provides the incentive to assess the strategy performance as consolidated improvement in operating performance by accumulating the financials for both the platform and follow-ons, instead of assessing the performance of each firm separate. This, however, disallows us from examining the effect of every follow-on acquisition on the strategy performance separately, as there is no variation in the dependent variable - strategy performance - within each strategy for these different add-on regressions. Nonetheless, we can assess the effect of the follow-ons on the strategy performance by means of either (1) summing the financials for the different follow-ons per strategy or (2), computing the average financials and characteristics for the follow-ons per strategy. As the number of follow-ons per strategy differs a lot between strategies, and this paper aims to compare apples with apples, it computes the average statistics of follow-ons per strategy.[19] Regressing this on the optimal conditions for a buy-and-build strategy, results in the following primary regression specifications.

$$\Delta ROA_j = \alpha + \beta_1 Company\ Conditions_{ij} + \beta_2 \boldsymbol{X}_{ij} + \eta_f + \varepsilon_{ij} \quad (5)$$

Where the company conditions are a vector of the strategy operating revenue, the relative capacity utilization, the relative size, the number of follow-ons, the platform return on assets (ROA) ratio, and the average follow-on return on assets (ROA) and return on sales (ROS) ratios. This first regression focusses on the optimal prevalence company conditions. It does so by combining both the conditions proposed by Borell and Heger (2013) and Bansraj and Smit (2017). The $Strategy\ Operating\ Revenue$ is the natural logarithm of sum of the platform and follow-on operating revenues at the time of acquisition by the strategy. The relative size is the turnover of the platform relative to the turnover of the mean follow-on as described in equation (6).

[19] Robustness analyses have interchanged these computations and the results generally hold for this change, when controlled for the number of follow-ons.

$$Relative\ Size = \frac{Turnover_{Platform}}{\left(\frac{\sum_{i=1}^{N} Turnover_{Follow\text{-}on}}{N}\right)} \quad (6)$$

Both the $Average\ Follow\text{-}on\ ROS$ and the $Average\ Follow\text{-}on\ ROA$ are return on sales and return on assets, respectively, computed as the per strategy averages of the follow-ons using EBIT as a measure of return. $Platform\ ROA$ speaks for itself and is the return (EBIT) on assets for the platform company. The return on assets variables both relate to the study of Bansraj and Smit (2017) as well as Borell and Heger (2013) through the phenomenon of so-called capacity utilization. Nonetheless, a separate measure for the relative capacity utilization between the platform and mean follow-on based on the asset turnover (ATR) is added and computed as in equation (7).

$$Relative\ Capacity\ Utilization = \frac{ATR_{Platform}}{\left(\frac{\sum_{i=1}^{N} ATR_{Follow\text{-}on}}{N}\right)} \quad (7)$$

Small strategies with only a few acquisitions are expected to differ substantially from other strategies with many acquisitions and as we have seen from table 2 the number of acquisitions differ quite much throughout the sample of strategies. Hence, a count variable on the number of follow-on acquisitions is added to the regression. Moreover, $\boldsymbol{X_{ijtf}}$ denotes a set of controls including the prementioned other performance drivers of buy-and-build strategies which are more precisely discussed in the next section and the industry fixed effects are captured in η_f for industry f. These fixed affects are based on the platform industry and the groups are pooled at a 1-digit NACE level.

$$\Delta ROA_j = \alpha + \beta_1 Industry\ Conditions_{ijf} + \beta_2 \boldsymbol{X}_{ij} + \eta_f + \varepsilon_{ijf} \quad (8)$$

Where the industry conditions vector consists of the inverted HHI, the market volatility, the market growth and market size. The second regression looks closer at the industry conditions for the strategy. For the main analyses, these conditions have been computed and matched on the 2-digit NACE industry codes to the platform company.[20,21] The inverted Herfindahl Hirschman Index (HHI) is used to asses fragmentation instead of concentration as in Bansraj and Smit (2017) and is computed as one divided by the HHI from equation (1).[22] The market volatility is measured as the standard deviation of market sales

[20] Robustness checks are performed to check for 4-digit NACE industry codes.
[21] As the prevalence conditions are mainly based on the start of a strategy (the platform), the main analyses will focus on the platform conditions. However, further analyses will check for follow-on and exit conditions.
[22] This results in equation (A1) in table A2 of the appendix.

within 3 year moving window. The market growth is defined as the YoY (year-on-year) sales growth rate per industry, and the market size is the natural logarithm of sales per industry. Again, $\boldsymbol{X_{ijtf}}$ denotes the set of controls and η_f denotes the industry fixed effects at a 1-digit level to allow for freedom of industry conditions within fixed effects groups through bigger groups as well as time varying freedom.

$$\Delta ROA_j = \alpha + \beta_1 Financing\ Conditions_{ij} + \beta_2 \boldsymbol{X}_{ijf} + \eta_f + \varepsilon_{ijf} \quad (9)$$

Where the financing conditions vector consists of the $FTSE\ 350\ Index$, the $LIBOR$, the $Spread$, the $Exchange\ Rate$, CPI and $GDP\ Growth$. The third regression directs at the financing conditions at the time of the platform acquisitions. The FTSE 350 Index, is the daily industry specific index as described in figure A4 in the appendix at the time of the platform acquisition. The LIBOR is the 3-month maturity LIBOR at the day-specific time of acquisition. The spread is the absolute difference between the Euro High Yield and the LIBOR. The exchange rate is the day-specific GBP to USD exchange rate. The CPI represents inflation and is the nominal yearly Consumer Price Index at the time of the platform acquisition. GDP growth is based on the quarterly[23] UK GDP growth rate. Again, the set of controls are denoted by $\boldsymbol{X}_{ijf}$ and the industry fixed effects by η_f.

$$\Delta ROA_j = \alpha + \beta_1 Company\ Conditions_{ij} + \beta_2 Industry\ Conditions_{ijf} + \beta_3 Financing\ Conditions_{ij} + \beta_4 \boldsymbol{X}_{ijf} + \eta_f + \varepsilon_{ijf} \quad (10)$$

The last regression combines the company, industry and financing conditions but at the risk of including too many parameters in the model. Section 5.5, further on, will discuss this issue. [24]

4.2 Control Variables

The inclusion of control variables helps in with capturing the effect of the acquisition conditions on the buy-and-build strategy performance. Whereas the number of follow-on acquisitions is included in the company specific regression as a variable of interest, small strategies with only a few acquisitions are also expected to differ substantially from other strategies with many acquisitions when it comes to the industry and financing conditions. Hence the number of follow-on acquisitions enters the vector of controls. Moreover,

[23] The results are the same when the GDP growth is computed on an annual basis (YoY).

[24] Unfortunately, the inclusion of time fixed effects is not possible in above-shown regressions as the inclusion of both industry and time fixed will leave too little variation within groups when the dataset is so little.

throughout the sample, there is quite some difference in the length of the strategies in terms of time. While on average strategies last around 5 years, others last more than 13.[25] For that reason, the length of the strategy in terms of days is controlled for as well. Furthermore, some PE firms might be more experienced than others which could result in the increased ability to enhance strategy performance. Unfortunately, it is a difficult aspect to conceptualize in terms of a control variable as we cannot actually observe experience. Nonetheless, we try to control for the PE firm experience by including the age of the PE firm measured as the platform acquisition date minus the PE firm founding date.[26] Lastly, numerous studies within financial economics have proven that to some extent, a certain size effect exists. In general, smaller firms tend to outperform bigger firms. To control for this effect, the natural logarithm of the strategy assets is included in the vector of controls, described as in equation (11)

$$Size\ effect\ control = \ln\left(Assets_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=0}^{F_{ij}}\right)\right) \quad (11)$$

These above-mentioned controls enter $\boldsymbol{X_{ijtf}}$, the vector of controls for which the inclusion of several controls is alternated across several analyses.

4.3 Potential Bias

4.3.1 The Probability of Exiting

This study looks at the conditions that affect the exit performance of buy-and-build strategies. Nonetheless, this sample also includes strategies that have not been exited in the time of the data assembly period and have been censored right. While some of these might just have started when the time period ended, others might not have exited for a reason. It might be the case that PE firms only sell their (read: exit) portfolio companies when they are successful and time the exit wisely when the price is optimal, and the profit is the highest[27]. This bias potentially skews the results due to successful strategies exiting which can be found back in the dependent variables for this study. The question however is whether this is related to the independent variables because if so, this would result in an issue. Nonetheless, if it is not related to the independent variable, it still causes limited inferences as it cannot be said that

[25] See table 1 of section 3.1 for more information regarding the length of the strategies.
[26] The age is capped at 25 years as it is not expected to affect the ability beyond this number and this reduces the weight placed on the experience outliers.
[27] For papers regarding this topic, please read McKaskill et al. (2004), Schmidt et al. (2010), Folus & Boutron (2015) and Rigamonti et al. (2016).

these results hold out-of-sample. In order to test whether strategies exit is related to specific company characteristics or conditions, this study makes use of the Probit models specified in equations (12) – (14).

$$\Pr\left(Exit_{ij} = 1 \,\middle|\, Company\ Conditions_{ij}, \boldsymbol{X}_{ij}\right) = \Phi(a_1 Company\ Conditions_{ij}, + a_2 \boldsymbol{X}_{ij}) \quad (12)$$

$$\Pr\left(Exit_{ij} = 1 \,\middle|\, Industry\ Conditions_{ij}, \boldsymbol{X}_{ij}\right) = \Phi(a_1 Industry\ Conditions_{ijf}, + a_2 \boldsymbol{X}_{ij}) \quad (13)$$

$$\Pr\left(Exit_{ij} = 1 \,\middle|\, Financing\ Conditions_{ij}, \boldsymbol{X}_{ij}\right) = \Phi(a_1 Financing\ Conditions_{ij}, + a_2 \boldsymbol{X}_{ij}) \quad (14)$$

Where $Company\ Conditions_{ij}$, $Industry\ Conditions_{ij}$, $Financing\ Conditions_{ij}$ are the conditions as described in section 4.1. $\boldsymbol{X}_{ij}$ is the set of controls described in section 4.2, excluding the controls that can be attributed to exited strategies only (e.g. the length of a strategy). The dependent variable is the probability of the strategy being exited conditional on the conditions and controls.

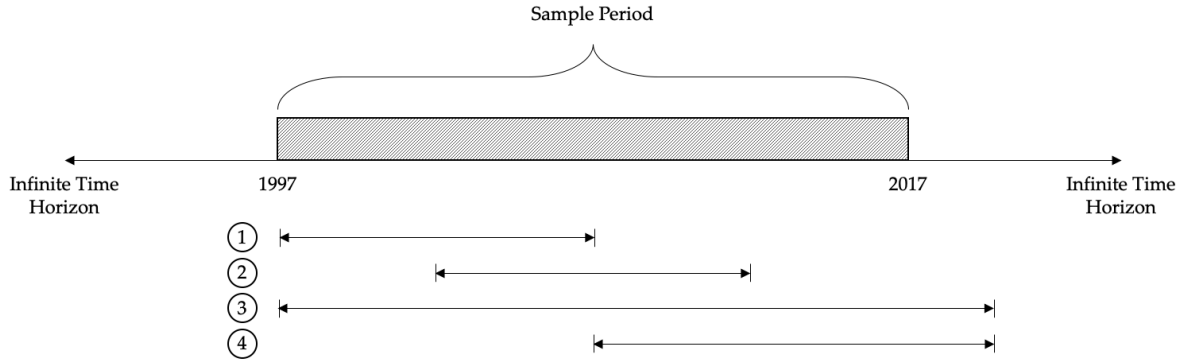
4.3.2 Survival Analysis

Another perspective on this probability of exiting is by use of duration models (survival analysis). Survival analysis is a mechanism to determine the duration of time until an event happens, which is in this case, the exit of a strategy. This concern has been briefly touched upon in section 3.1 with tables 1 and 2, but the problem can be visualized more clearly using figure 1. As the sample period only includes acquisitions and exits between 1997 and 2017, there are four options for the duration and timing of the strategies. First of all, the sample includes strategies that started at the beginning of the sample and ended (through an exit) during the sample period. Secondly, it includes strategies that begun and ended within the time period of the sample. Third, the sample could include strategies that started at the beginning of the sample and ended beyond the time horizon of this sample (2017)[28]. Finally, the sample includes strategies that started during the sample period and ended afterwards. These strategies have been censored right. Moreover, we don't know why certain strategies have not exited (right censored). As beforementioned, while typically a PE firm sells a portfolio company after circa 3 years, buy-and-build strategies typically last 5 or more years. Nonetheless, there are enough strategies in the sample that do not exit within this time period.

[28] This is actually not the case as the sample does not include strategies that have not been exited in more than 20 years.

Is it the case that PE firms wait for the perfect market timing? Or the fact that the strategies have not yet made enough improvement to be able to be profitable. This makes sense and hence the sample probably has a bias towards more successfully exited strategies. While, this still causes limited inferences as it cannot be said that these results hold out-of-sample, it is not yet a major concern as it is logical that PE firms exit strategies when successful. A problem arrives if the independent variables in this model affect the probability of exiting, also in terms of the duration of a strategy.

Figure 1: Duration and timing of the strategy. This figure provides insights on multiple options for the duration and timing of strategies in the sample.



To start off, the paper will explore the survival analysis using non-parametric models. In terms of terminology, the hazard function is the probability that the strategy will exit at time t given that the strategy has the possibility of exiting at time t because it has not done so yet. And this hazard rate changes over time as the probability of exiting is low at the beginning of the strategy and will peak at after a few years. The hazard rate can be described using function (15).

$$\lambda(t) = \frac{f(t)}{S(t)} \Rightarrow \lambda(t_j) = \frac{d_j}{n_j} \tag{15}$$

Where f(t) is the chance of failure at time t, S(t) is the survival function which is the probability that the strategy will be at least t. The second part reveals it more practically, where d_j is the number of exits (let's say 10), n_j the number at risk (let's say 100). The hazard rate would then be 0.1. In order to see the rate of the strategies being exited at that time, the Nelson-Aalen estimator of the cumulative hazard function, specified in equation (16) gives a better view.

$$\Lambda(t_j) = \sum \frac{d_j}{n_j} \tag{16}$$

The Kaplan-Meier estimator of the survival function (eq. (17)), then provides insights on the probability that the strategy is longer than t.

$$S(t_j) = \prod \frac{n_j - d_j}{n_j} \tag{17}$$

To include the independent variables in order to see its relation the hazard rate, this paper switches from nonparametric models to parametric models. The analysis mainly relies on the Cox proportional hazard model (eq. (18)).

$$\lambda(t|Conditions_i) = \lambda_0(t)\exp(\beta \cdot Conditions_i) \tag{18}$$

Where the $Conditions_i$ are the company conditions, industry conditions or the financing conditions. To check for robustness, this paper will also perform Weibull and Gompertz analyses.

4.3.3 Heckman Selection Model

Considering the fact that the independent variables may be related to the decision to exit, there is a problem of endogeneity because we only observe the strategy performance at the time of the exit in this model if the strategy is actually exited. This paper tries to solve for this bias by making use of a Heckman two step selection model (see Heckman (1976)). To illustrate this problem and this model, let's take a few steps back and look at the general simplified model of this study (eq. (19)).

$$Strategy\ Performance_j = \beta_1 + \beta_2 Conditions_j + e_j \tag{19}$$

Where $j = 1, \dots, n$ and $N > n$. The latter is the case that we only observe the performance of exited strategies "n" while the sample including not exited strategies "N" is bigger. And this selection to exit can be expressed as in equation (20) and can depend on some independent variables. (For simplicity purposes, the model here is restricted to only dependent variable).[29]

$$z_j^* = \gamma_1 + \gamma_2 w_j + u_j \tag{20}$$

$$z_j \begin{cases} 1\ if\ z_j^* > 0 \\ 0\ \text{otherwise} \end{cases}$$

[29] For a more extensive discussion on the subject, please review Heckman (1976).

Where z_j^* is the latent variable that is not observed. Instead, the observed variable is z_j, the binary variable taking a 1 if the strategy exited. Here, $j = 1, \dots, N$ as it includes both exited and non-exited strategies. Then, this equation can be measured using the Probit regression specifications in equations (12)-(14). However, based on the results of these Probit models as well as economic reasoning, the first stage selection equations are shown in equations (21)-(23).

$$\begin{aligned}&\Pr\big(Exit_j = 1 \,\big|\, Strategy\ Turnover_j + Relative\ Capacuty\ Utilization_j + \\ &Relative\ size_j + Strategy\ Length_j\big) = \Phi(a_1 Strategy\ Turnover_j + \\ &a_2 Relative\ Capacuty\ Utilization_j + a_3 Relative\ size_j + a_4 Strategy\ Length_j)\end{aligned} \tag{21}$$

$$\begin{aligned}&\Pr\big(Exit_{jft} = 1 \,\big|\, Inverted\ HHI\ Bottom_{ft} + Market\ Volatility_{ft} + Market\ Growth_{ft} + \\ &Strategy\ Length_j\big) = \Phi(a_1 Inverted\ HHI\ Bottom_{ft} + a_2 Market\ Volatility_{ft} + \\ &a_3 Market\ Growth_{ft} + a_4 Strategy\ Length_j)\end{aligned} \tag{22}$$

$$\begin{aligned}&\Pr\big(Exit_{ij} = 1 \,\big|\, LIBOR_t + GDP\ Growth_t + Strategy\ Length_j\big) = \Phi(a_1 LIBOR_t + \\ &a_2 GDP\ Growth_t + a_3 Strategy\ Length_j)\end{aligned} \tag{23}$$

In order to solve for this bias, the Heckman Correction makes use of the Inverse Mills Ratio specified in equation (24), which takes the estimated parameters γ_1 and γ_2 from the Probit regressions.

$$Estimated\ Inverse\ Mills\ Ratio\ (IMR) = \tilde{\lambda}_j = \frac{\phi\big(\tilde{\gamma}_1 + \tilde{\gamma}_2 w_j\big)}{\Phi\big(\tilde{\gamma}_1 + \tilde{\gamma}_2 w_j\big)} \tag{24}$$

Where the $\phi(\cdot)$ is the standard normal probability density function, and $\Phi(\cdot)$ is again the cumulative distribution function. Then the estimated IMR ($\tilde{\lambda}_j$) can be inserted into the prior regression equation (19) resulting in second stage regression equation (25) in order to account for the selection bias.

$$Strategy\ Performance_j = \beta_1 + \beta_2 Conditions_j + \beta_3 \boldsymbol{X}_{ij} + \beta_\lambda \tilde{\lambda}_j + e_j \tag{25}$$

Where $j = 1, \dots, n$ and $N > n$. The $Conditions_i$ are the company conditions, industry conditions or the financing conditions as described in section 4.1. $\boldsymbol{X}_{ij}$ is the set of controls for firms i in strategy j described in section 4.2. This selection model allows us to recover unbiased estimates for β_2.

5 Results

5.1 Company Conditions

Table 5 provides the ordinary least squares (OLS) regression results for the company conditions from equation (5). The main measure of strategy performance is the consolidated change in the return on assets (ROA) ratio between the time of the exit and acquisition and column 5 shows the full specification including industry fixed effects. In terms of the accumulated operating revenue per strategy, the results indicate the existence of a size effect such as previously state in terms of acquirer returns by Moeller, Schlingemann and Stulz (2004) or the small firm effect in general as observed by Banz (1981). More specifically, a 1% increase in the total operating revenue of the strategy at the time of acquisition is associated with a 0.15991 decrease in the change of the return on assets (ROA) ratio during the strategy period which is statistically significant at the 5% level, ceteris paribus. The relative capacity utilization in terms of asset turnover (ATR) between the platform and follow-on acquisition, is found to be negatively related with the strategy performance.[30] This makes sense with respect to the aforementioned theory by Borell and Heger (2013) as a lower relative capacity utilization ratio means a lower level of capacity utilization relative to the follow-on. This relation is found to be statistically significant at the 10% level. The relative size is not significantly related to the strategy performance.

The fact that the average follow-on return on assets (ROA) is negatively related with strategy performance, in combination with the previously discussed relative capacity utilization measure suggests the following two notions. (1) More underperforming follow-ons enable improvability. Nonetheless, (2) platforms should still always entail a lower capacity utilization than follow-ons which has probably to do with the reallocation of resources (Borell and Heger, 2013). Still, this inference is cautious as the average follow-on return on assets (ROA) ratio only shows statistical significance at the 10% level.[31]

The other measure for the profitability of the follow-ons as the return on sales (ROS), shows a positive relationship with the strategy performance but does not seem to be statistically significant. As previously discussed, while both the ROA and ROS are measures of efficiency of a firm, they tell a different story as the return on assets (ROA) focusses on asset

[30] This result is robust for computing the capacity utilization using EBIT instead of turnover.
[31] This also is robust for interchanging the EBIT with EBITDA in the computation of the ROA.

efficiency through to what degree the assets of a firm are put into work to generate profit[32] while return on sales (ROS) shows how much of the sales revenue remains after paying the operating costs associated with the revenue. Hence, follow-ons seem to be beneficial for buy and build strategies when underperforming in terms of asset efficiency whilst enjoying profitability in terms of the return on sales (ROS).[33]

The number of follow-ons as a proxy of strategy size is not found to be positively related to strategy performance which suggests that quantity is not the dominant factor in buy-and-build strategies, but still quality is. Nonetheless, the coefficient does not show statistical significance. It is reassuring that prior columns (1-4) predominantly do not show different signs for the coefficients indicating that these results are robust for the inclusion or exclusion of variables of interest, controls and industry fixed effects.

In general, these findings are in line with the first hypothesis. Private equity firms select platforms and follow-on companies for buy-and-build strategies that increase the operating performance of consolidated strategies through the possibility of reallocation of resources and capacity utilization and by acquiring improvable follow-ons. The results, however, do not find statistically significant evidence that follow-ons need to be sizable relative to the platform in order to add value. Moreover, the strategy performance is not found to be affected by the number of follow-on acquisitions but tends to deteriorate when the total size in terms of turnover increases indicating a size effect. Furthermore, these coefficients show quite substantial economic significance as can be seen from the descriptive statistics tables.

When the measure of performance is interchanged for the change in the return on sales, the results show that the total strategy variables (operating revenue, relative size and relative capacity utilization), still show the same relationships with the performance of buy-and-build strategies whilst to a statistical significance and magnitude. The fact that the coefficients with the change in return on sales as the dependent variable are substantially smaller is not

[32] As returns are measured using EBIT and not revenue to distinguish between asset turnover (ATR) and return on assets (ROA).

[33] While the follow-on ROA and ROS do not report a high correlation level, as can be seen from table A1 in the appendix, one might still raise concerns on the possible problem of (perfect) multicollinearity between the two within these regressions. However, the variance inflation factors do not report value above 1.5 throughout the different models eliminating the concerns for this problem. Most studies maintain variance inflation factor (VIF) values north of 10 as problematic multicollinearity (Hair et al., 1998). However, recent studies even state that VIF values above 10 can still be regarded as solvable under certain conditions (O'Brien, 2007). This paper takes multicollinearity strict and maintains a maximum acceptable VIF value of 5.

surprising as the standard deviation for the change in ROA, even when winsorized, is more than 100 times as big.[34] The platform and follow-on specific characteristics do, however, show different relations with the strategy performance in terms of the change in return on sales (ROS) which insinuates that these relations are not benefactors for both an increase in the asset efficiency (ROA) as well as the profitability in terms of the change in return on sales (ROS). With respect to the change in asset turnover as the strategy performance measure, the model does not show much statistical significance and gradually the same coefficient signs as the ROA models except for the operating revenue, indicating a reverse size effect. [35]

Table 5: Company conditions. This table provides the regression results for equation (5) which is the regression of the consolidated operating strategy performance on the company conditions. The dependent variables have been winsorized. The relative variables are the ratio's between the platform and mean follow-on. Robust standard errors are in parentheses and are clustered on a 4-digit NACE level. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Δ in ROA	(2) Δ in ROA	(3) Δ in ROA	(4) Δ in ROA	(5) Δ in ROA	(6) Δ in ROS	(7) Δ in ATR
Operating Revenue (ln) (strategy)	-14.213**	-14.141**	-15.932**	-15.466**	-15.991**	-0.046	1.427*
	(5.69)	(5.86)	(7.34)	(7.58)	(7.63)	(0.04)	(0.74)
Relative Capacity Utilization	-6.584*	-6.540*	-6.007*	-6.234*	-6.206*	-0.019**	-0.433
	(3.58)	(3.53)	(3.28)	(3.32)	(3.22)	(0.01)	(0.45)
Relative Size	0.004**	0.004**	0.003*	0.003*	0.003	0.000***	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Return on Assets (platform)		2.755	20.833	21.419	15.622	-0.219*	5.110
		(21.10)	(21.24)	(21.88)	(22.38)	(0.12)	(3.40)
Return on Sales (follow-on)			1.454	1.171	2.453	-0.063	1.601
			(3.64)	(3.66)	(4.11)	(0.05)	(0.97)
Return on Assets (follow-on)			-46.753*	-47.414*	-49.081*	-0.020	-3.620
			(26.74)	(27.41)	(25.86)	(0.11)	(2.46)
N# of follow-ons				1.007	-0.908	0.005	-0.019
				(1.58)	(1.79)	(0.00)	(0.12)
Observations	108	108	108	108	108	107	107
R-squared	0.113	0.113	0.161	0.164	0.221	0.286	0.478
Controls	NO	NO	NO	YES	YES	YES	YES
Industry FE	NO	NO	NO	NO	YES	YES	YES

[34] These statistics can be seen in table A3 in the appendix.

[35] The results are robust for computing the dependent variables (change in ROA and ROS) using EBITDA instead of EBIT.

5.2 Industry Conditions

Table 6 includes the results for the industry conditions at the time of the platform acquisition and their effect on the strategy performance. Column 5 presents the full specification of the industry conditions as in equation (8) including controls and fixed effects.[36] Note that the Herfindahl Hirschman Index has been inverted in order to display market fragmentation instead of consolidation. I.e. A higher score on the inverted HHI means a more fragmented market. The results indicate that the market fragmentation of the top market segment is positively related with the strategy performance in terms of the change in return on assets (ROA). A more fragmentated market should provide more acquisition options and hence improve the ability to find a more suitable target for the strategy. Columns 1-3 in combination with the 4th and 5th column furthermore have provided the evidence that the market fragmentation effect is mainly driven by the top market segment. Regarding the influence of the market fragmentation on the exit opportunities, this model is not expected to include exit multiple expansion due to market fragmentation but is expected to include the effect that the exit timing can be pursued more favourably when exit opportunities are widely available.

Furthermore, the market volatility is, while statistically insignificant, negatively related with the strategy performance which is consistent throughout the models. This is in line with the expectations as uncertainty in general is unfavourable for such investments. Both the market growth as well as the size at the time of acquisition are positively related to the change in return on assets (ROA) which is in line with the expectation as market growth allows for growth of the firms and a large market size enables opportunities. Nonetheless, only the market size is found to be statistically significant at the 5% level. Furthermore, the strategy performance does not seem to be significantly affected by the number of follow-ons.

Overall, these findings are consistent with the second hypothesis. Private equity firms chose to start buy-and-build strategies in industries that are optimal for the improvement of the performance of the strategies through higher market fragmentation enabling the possibility of acquiring suitable targets. Moreover, these markets need to be sizable to facilitate operating improvement. Furthermore, these coefficients show quite substantial economic significance as can be seen from the descriptive statistics tables.

[36] The industry fixed effects are based on a 1-digit NACE level to allow for variation within groups and the industry conditions are more specific on a 2- and 4-digit NACE level.

The table shows consistent results throughout the different models including or excluding specific variables, controls and fixed effects. With respect to the change in the return on sales (ROS) as the measure of performance, most conditions show consistent relations with before. Nonetheless, the market fragmentation effect on the strategy performance now seems to be driven by the bottom segment of the market. This could be to the fact that platform companies on average are larger than follow-on companies and hence are located more towards the top segment of the market implying that a more fragmented top market segment provides opportunities of acquiring the right platform that improves the return on assets of a strategy while the follow-ons in the lower segment of the fragmented market allow for improvement of the return on sales of a strategy.[37] The model using the change in asset turnover (ATR) as the measure of performance shows opposing results with respect to market fragmentation but nevertheless does not provide statistical significance for any inferences.

[37] The results are robust for computing the dependent variables (change in ROA and ROS) using EBITDA instead of EBIT.

Table 6: Industry conditions. This table provides the regression results for equation (8) which is the regression of the consolidated operating strategy performance on the industry conditions of the platform at the time of the platform acquisition. While the question was raised whether the mid and bottom segment of market fragmentation should raise concerns regarding (perfect) multicollinear, the Variance Inflation Factors (VIF) did not report extreme values. Industry fixed effects are based on 1-digit NACE groups while industry conditions are computed on a 2-digit NACE level leaving variation in the industry conditions within groups and time. Robust standard errors are in parentheses and are clustered on a 4-digit NACE level. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Δ in ROA	(2) Δ in ROA	(3) Δ in ROA	(4) Δ in ROA	(5) Δ in ROA	(6) Δ in ROS	(7) Δ in ATR
Inv. Herfindahl (ln)	5.768	10.578**	10.745**				
	(5.08)	(4.94)	(5.02)				
Inv. Herfindahl Top (ln)				12.237**	13.169**	-0.005	-0.884
				(5.61)	(6.00)	(0.04)	(0.81)
Inv. Herfindahl Mid (ln)				-6.586	-8.885	-0.065	0.469
				(5.75)	(5.93)	(0.04)	(0.82)
Inv. Herfindahl Bottom (ln)				5.102	3.222	0.104**	-0.804
				(5.77)	(6.94)	(0.05)	(0.96)
Market Volatility		-0.191*	-0.191*	-0.192*	-0.107	-0.001	-0.013
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market Growth (%)		4.804	4.736	6.082	10.796	0.039	0.942
		(9.95)	(10.07)	(10.14)	(10.36)	(0.08)	(1.58)
Market Size (ln)		4.685	4.616	4.791	9.222**	0.001	0.349
		(3.85)	(3.91)	(4.12)	(4.66)	(0.03)	(0.66)
N# of follow-ons			0.130	-0.001	-0.664	-0.001	0.178
			(1.76)	(1.77)	(1.79)	(0.01)	(0.24)
Observations	195	185	185	185	185	173	174
R-squared	0.007	0.038	0.038	0.047	0.100	0.067	0.130
Controls	NO	NO	YES	YES	YES	YES	YES
Industry FE	NO	NO	NO	NO	YES	YES	YES

5.3 Financing Conditions

Table 7 provides the regression results for the strategy performance on the financing conditions at the time of the platform acquisition. Column 5 presents the full specification as the inflation variable should be left out in order to interpret the coefficients because of the multicollinearity between the CPI and the LIBOR.[38] The proxy for the public market valuation, the FTSE 350 index, shows a positive relationship with the strategy performance statistically significant at the 5% level. Regarding the debt market conditions, the LIBOR at the time of acquisition seems to be negatively related to the strategy performance supporting the idea that a lower interest rate increases the possibility to increase leverage and thus financing options, but no statistically significant evidence is found for this relationship. Moreover, favourable

[38] Not only does table A1 in the appendix show a high correlation between the LIBOR and CPI (-0.844), the Variance Inflation Factor (VIF) test also reported values above 5 for these regressions which raise multicollinearity concerns.

debt market conditions would suggest a negative relation between the spread and the strategy performance as well, but the coefficient shows an opposite sign. Nonetheless, this relation is not found to be statistically significant as well.

As the exchange rate is computed using the Pound Sterling (GBP) as the base currency relative to the US Dollar (USD), the negative coefficient for the exchange rate means that if the exchange rate increases, so the Pound Sterling appreciates against the US Dollar, it is associated with a decrease in the change in the return on assets (ROA) during the strategy. This is not surprising as the Pound Sterling is now more expensive which makes goods and services (by the strategy companies) relatively more expensive for foreign countries reducing sales. Nonetheless, it is not found to be statistically significant in the full specification model. The GDP growth is positively related to the strategy performance, but this relationship is not found to be statistically significant. A reason for this could be that the GDP growth at the time of the platform acquisition is not a predictor of the GDP growth throughout the whole strategy which on average lasts about 5 years. Moreover, the effect of GDP growth is expected to have a lagged effect on the sales of a company (and thus strategy) through disposable income.

The fact that private equity firms time their investments optimally for the improvement of strategy operating performance through a higher market valuation is consistent with hypothesis three. Furthermore, the coefficient shows quite substantial economic significance as can be seen from the descriptive statistics tables. Nonetheless, no statistical evidence is found that favourable debt market and macroeconomic conditions are necessary to facilitate this improvement.

Columns 7 and 8 show that these relationships between the financing conditions and strategy performance do not hold if the strategy performance is measured as the change in the return on sales (ROS) or asset turnover (ATR). More specifically, (1) the GDP growth is found to be negatively related to the change in the return on sales (ROS) and (2) the public market valuation negatively with the change in asset turnover (ATR). A possible reason for the negative relationship between the GDP growth and change in return on sales (ROS) could be due to the excess demand through GDP growth driving sales beyond optimal relative to costs. Still, GDP growth at the time of the platform acquisition is not expected to be a predictor of

the GDP growth throughout the whole strategy and the effects are probably observed with a lagged perspective.[39]

Table 7: Financing conditions. This table provides the regression results for equation (9) which is the regression of the consolidated operating strategy performance on the financing conditions at the time of the platform acquisition. The spread is the high yield minus the LIBOR. The inflation (CPI) has been left out of most models because of multicollinearity. Robust standard errors are in parentheses and are clustered on a 4-digit NACE level. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Δ in ROA	(2) Δ in ROA	(3) Δ in ROA	(4) Δ in ROA	(5) Δ in ROA	(6) Δ in ROA	(7) Δ in ROS	(8) Δ in ATR
FTSE 350 Index	0.004**	0.004**	0.004**	0.004*	0.004**	0.005**	-0.000	-0.001***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LIBOR		-3.196	-5.179*	-5.433*	-4.556	-11.003*	0.027	-0.659
		(2.67)	(2.87)	(2.87)	(3.12)	(6.19)	(0.02)	(0.40)
Spread		-0.601	1.955	2.888	2.963	3.480	0.031*	-0.559*
		(1.63)	(2.14)	(2.28)	(2.50)	(2.53)	(0.02)	(0.32)
Exchange Rate			-258.472*	-300.565**	-253.826	-370.538*	-1.568	26.930
			(142.43)	(146.62)	(161.40)	(187.96)	(1.06)	(21.14)
GDP Growth				833.483	552.144	371.382	-12.708***	54.276
				(702.62)	(722.07)	(736.44)	(4.80)	(96.01)
N# of follow-ons					-1.034	-0.808	-0.015	0.409*
					(1.93)	(1.93)	(0.01)	(0.24)
Inflation						-1.939		
						(1.61)		
Observations	196	178	178	178	178	178	166	167
R-squared	0.023	0.036	0.054	0.061	0.106	0.114	0.160	0.231
Controls	NO	NO	NO	NO	YES	YES	YES	YES
Industry FE	NO	NO	NO	NO	YES	YES	YES	YES

5.4 All Conditions

Table A7 (appendix)[40] provides the results for the regression models including all conditions in order to see if the relationships still hold and whether the strategy performance is more sensitive to the company, industry or financing conditions when they are all accounted for. The concern of danger of these models including all the condition variables, controls and fixed effects is raised in the situation of a low amount of observations, When there's little variation in the observations, the Ordinary Least Squares estimates will provide no out-of-sample performance due to the lack in degrees of freedom. Nonetheless, with this kept in mind, this table can provide a base for the dynamics and robustness of these conditions. Column 3 shows

[39] The results are robust for computing the dependent variables (change in ROA and ROS) using EBITDA instead of EBIT.

[40] Moved to the appendix for brevity reasons as it is used for a robustness analysis only.

the full specification including controls and fixed effects and excluding the inflation rate to avoid the multicollinearity problem.

Regarding the company conditions, we can see that the size effect and the relative capacity utilization are equally or even more statistically significant and that the coefficients have increased in magnitude. Only the return on assets (ROA) for the platform has changed of sign but in both regressions, these relations were not found to be statistically significant so not much of a concern is raised here.

While reducing statistical significance, the industry condition coefficients are consistent with prior results in terms of sign and magnitude. Only the top market fragmentation and market growth coefficients have increased in magnitude.

The results for the financing conditions are also consistent with preceding findings. Only the spread now shows a negative relation with the strategy performance which is actually in line with previous set expectations as a lower high yield spread is associated with a more favourable debt market. Nonetheless, this relation is still statistically insignificant.
In general, while statistically insignificant, the number of follow-on acquisitions pursued in a buy-and-build strategy is found to be negatively related to strategy performance indicating that bigger strategies not always provide better results, and the quality of the acquisitions outperforms the quantity in achieving synergies.[41]

[41] The results are robust for computing the dependent variables (change in ROA and ROS) using EBITDA instead of EBIT.

5.5 Exit Probability

Section 4.3 described the issue that in terms of strategy performance, we only observe the outcome for the exited strategies which could result in a bias. As beforementioned, strategies are likely to exit if they are successful to optimize profit generation. This results in a bias if the exit is related to the independent variable. Hence, Probit analyses from equations (12)-(14) are performed as well as a Probit analysis including all conditions. The combined results for the separate condition regressions can be found in table 8. A note must be made on the interpretation of the different columns. One must be cautious with the inference about partial effects such as the marginal effects at the means rather than the coefficients. This has to do with the statistical significance. For example, in column 1, the coefficient for the platform ROA is not statistically significant, but it is statistically significant in column 2, specifying the marginal effects at the mean. Statistically significant marginal effects are a partial effect and do not represent evidence to test the hypothesis about a variable.

Table 8: Probit regression of the company, industry and financing conditions. Note that this is a combination table of tables A8 – A10 in the appendix. Panels A, B and C are different models including the different conditions. Column 1 and 4 present the Probit results, columns 2 and 5 present the marginal effects at the means and columns 3 and 6 show the average marginal effects. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Probit	(2) Marginal Effects (μ)	(3) Marginal Effects	(4) Probit	(5) Marginal Effects (μ)	(6) Marginal Effects
Panel A: Company Conditions						
Operating Revenue (ln) (strategy)	0.075	0.025***	0.075	0.071	0.024**	0.071
	(0.07)	(0.01)	(0.07)	(0.07)	(0.01)	(0.07)
Relative Capacity Utilization	0.015	0.005**	0.015	0.015	0.005**	0.015
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Relative Size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	-0.077	-0.025	-0.077	-0.081	-0.027	-0.081
	(0.36)	(0.05)	(0.36)	(0.36)	(0.05)	(0.36)
Return on Sales (follow-on)	-0.016	-0.005	-0.016	-0.013	-0.004	-0.013
	(0.05)	(0.01)	(0.05)	(0.05)	(0.01)	(0.05)
Return on Assets (follow-on)	0.202	0.067***	0.202	0.206	0.068***	0.206
	(0.17)	(0.02)	(0.17)	(0.17)	(0.02)	(0.17)
N# of follow-ons	0.029	0.010	0.029	0.031	0.010	0.031
	(0.06)	(0.01)	(0.06)	(0.06)	(0.01)	(0.06)
Observations	171	171	171	171	171	171
Controls	NO	NO	NO	YES	YES	YES

Table 8: Probit regression of the company, industry and financing conditions. Continued.

	(1) Probit	(2) Marginal Effects (μ)	(3) Marginal Effects	(4) Probit	(5) Marginal Effects (μ)	(6) Marginal Effects
Panel B: Industry Conditions						
Inv. Herfindahl Top (ln)	-0.060	-0.021	-0.021	-0.051	-0.018	-0.018
	(0.07)	(0.02)	(0.03)	(0.07)	(0.02)	(0.03)
Inv. Herfindahl Mid (ln)	0.021	0.007	0.008	0.016	0.006	0.006
	(0.07)	(0.02)	(0.03)	(0.07)	(0.02)	(0.03)
Inv. Herfindahl Bottom (ln)	0.085	0.030	0.030	0.087	0.031	0.031
	(0.07)	(0.02)	(0.02)	(0.07)	(0.02)	(0.02)
Market Volatility	-0.001	-0.000	-0.000	-0.001	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market Growth (%)	-0.031	-0.011	-0.011	-0.033	-0.012	-0.012
	(0.05)	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)
Market Size (ln)	-0.016	-0.006	-0.006	-0.017	-0.006	-0.006
	(0.05)	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)
N# of follow-ons				0.019	0.007	0.007
				(0.04)	(0.01)	(0.01)
Observations	366	366	366	366	366	366
Panel C: Financing Conditions						
FTSE 350 Index	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LIBOR	0.112***	0.040***	0.041***	0.110***	0.039***	0.041***
	(0.04)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)
Spread (HighYield – LIBOR)	0.015	0.005	0.005	0.008	0.003	0.003
	(0.03)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
Exchange Rate	0.449	0.160	0.166	0.663	0.235	0.244
	(2.06)	(0.67)	(0.76)	(2.10)	(0.68)	(0.77)
GDP Growth	14.436	5.153*	5.319	14.627	5.190*	5.382
	(9.32)	(3.01)	(3.43)	(9.38)	(3.01)	(3.45)
N# of follow-ons				0.045	0.016	0.017
				(0.05)	(0.01)	(0.02)
Observations	360	360	360	360	360	360
Controls	NO	NO	NO	YES	YES	YES

Column 4 shows the full Probit specifications including the controls. Reassuringly, most conditions are not found to be statistically significantly related to the probability of the strategy being exited. Only the financing conditions related LIBOR seems to positively affect the probability of being exited within this sample with statistical significance. To interpret this coefficient and its effect on the probabilities, the fifth column provides more insights. At the mean, the increase of the London Interbank Offered Rate (LIBOR) by 1 at the time of the platform acquisition is associated with 3.9% points increase in the probability that the strategy has exited, statistically significant at the 1% level. On average, such a LIBOR increase of 1 is associated with marginally increasing the probability of the strategy being exited by 4.1% points, which is also statistically significant at the 1% level. Reassuringly, the inclusion or exclusion of controls does not seem to affect the probabilities.

The rest of the conditions generally do not show statistical significance. However, some company conditions such as the operating revenue, relative capacity utilization and average follow-on return on asset (ROA) ratio, at the mean, do show significance. For example, at the mean, a 1% increase in the accumulated operating revenue of the strategy at the time of acquisition is associated with 2.4% points increase in the probability that the strategy exited which is significant at the 5% level. But again, this represents a partial effect at the mean only and cannot attribute conclusions about the variable itself.

5.6 Survival Analysis

As mentioned before, this study takes it one step further in determining the influencing factors of the exit. In order to get a preliminary view of the data, figure A8 provides the results for the nonparametric survival analyses. The results are consistent with the idea that the probability that strategies exit is the highest around 2,000 days (slightly over 5 years). The survival rate in general is exponentially diminishing over time and the cumulative hazard rate is diminishingly increasing over time.

The (semi-)parametric models can be summarized in table 9, which is a combination of tables A12-A14 in the appendix. The main method of the survival analysis is the Cox proportional hazard model and the Gompertz and Weibull models serve as a check whether the results hold under these models.[42] Reassuringly, the results are gradually the same under the different models. Column 4 presents the full specifications including controls of the Cox proportional hazard models. The coefficient of the average return on assets for the follow-ons indicates that strategies with a higher average follow-on ROA, have a lower strategy duration, which means that they exit faster. This is statistically significant at the 5% level. This seems to be the only statistically significant relationship with the duration of the strategy found within the set of company conditions. Reassuringly, this relationship also holds without inclusion of controls and under the Weibull model. This indicates that private equity firms work towards

[42] The Cox proportional hazard model is preferred as we can fit survival models without the need to know or assume the distribution of the parameters. Next to this, most likely they do not resemble a normal distribution. Nonetheless, Table A20 in the appendix shows that the Weibull model consistently shows a lower Akaike Information Criterion for all regressions advocating value of this model. Reassuringly. The Weibull model shows consitent results with respect to signs, coefficients and statistical significance with the Cox proportional hazards model supporting the current interpretation of the results. For more discussion towards this subject, please review Jucket and Rosenberg (1993), Gokovalie et al. (2007) and Adelian et al. (2015).

strategies with on average higher capacity utilization follow-on acquisitions in order to successfully exit.

Table 9: Duration models of the exit on the company, industry and financing conditions. Note that this is a combination table of tables A12 – A14 in the appendix. Panels A, B and C are different models including the different conditions. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Cox	(2) Weibull	(3) Gompertz	(4) Cox	(5) Weibull	(6) Gompertz
Panel A: Company Conditions						
Operating Revenue (ln) (strategy)	0.027	0.047	0.053	0.006	0.029	0.038
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Relative Capacity Utilization	0.012	0.007	0.007	0.014	0.008	0.008
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Relative Size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	0.017	0.125	0.143	-0.023	0.079	0.106
	(0.30)	(0.30)	(0.30)	(0.31)	(0.31)	(0.31)
Return on Sales (follow-on)	0.006	0.032	0.030	0.035	0.063	0.055
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Return on Assets (follow-on)	0.031**	0.025*	0.020	0.032**	0.025**	0.020
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
N# of follow-ons	-0.002	0.017	0.019	0.006	0.024	0.025
	(0.05)	(0.05)	(0.04)	(0.05)	(0.04)	(0.04)
Observations	171	171	171	171	171	171
Panel B: Industry Conditions						
Inv. Herfindahl Top (ln)	-0.006	0.021	0.021	0.011	0.037	0.035
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Inv. Herfindahl Mid (ln)	-0.022	-0.014	-0.009	-0.036	-0.024	-0.017
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Inv. Herfindahl Bottom (ln)	0.072	0.041	0.035	0.087	0.052	0.043
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Market Volatility	0.001	0.001	0.000	0.001	0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market Growth (%)	-0.089	-0.219	-0.224	-0.088	-0.209	-0.215
	(0.08)	(0.14)	(0.15)	(0.08)	(0.14)	(0.14)
Market Size (ln)	-0.003	0.011	0.009	-0.012	0.003	0.002
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Observations	366	366	366	366	366	366
Panel C: Financing Conditions						
FTSE 350 Index	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LIBOR	-0.098**	-0.162***	-0.145***	-0.100**	-0.164***	-0.147***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Spread (HighYield – LIBOR)	-0.004	0.011	0.017	-0.009	0.005	0.012
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Exchange Rate	0.833	-2.326	-3.092	1.068	-2.083	-2.867
	(1.93)	(1.89)	(1.94)	(1.96)	(1.93)	(1.98)
GDP Growth	8.902	8.458	8.955	10.249	9.684	10.019
	(8.99)	(8.89)	(8.85)	(9.07)	(8.98)	(8.94)
Observations	360	360	360	360	360	360
Controls	NO	NO	NO	YES	YES	YES

Regarding the industry conditions (panel B), the models do not seem to find evidence of statistically significant relationships between the conditions and the duration of the strategy.

Panel C shows that the LIBOR seems to affect the duration of the strategy. More specifically, a higher LIBOR is related to increase the delay of an exit. Or in other words, the LIBOR seems to positively relate to the duration of the strategy. So, while the prior Probit models did not find conditions that affected the probability of the strategy being exited in this sample, the duration models did suggest that conditions affected the duration of the strategies and hence the likelihood of still not being exited at the end of the sample period.

5.7 Heckman Selection Model

While the previous shown results regarding the Probit models for the exit do not raise many concerns regarding a relation between the selection of exited strategies and the independent variables, there are a few partial effects that might still raise the concerns regarding endogeneity. Moreover, the survival analyses provided insights in the fact that the duration of the strategy seemed to be affected by company characteristics and financing conditions. Hence, as beforementioned, this study tries to solve for this selection bias by performing a Heckman twostep correction model as described in section 4.3.3 by including a selection equation with the exit probability affecters as well as the length of the strategy until exit or the end of the sample period as in equation (26).

$$Strategy\ length = \begin{cases} Exit\ date - start\ date, & Exit = 1 \\ Sample\ end\ date - start\ date, & Exit = 0 \end{cases} \quad (26)$$

Table 10: Heckman twostep selection models of the exit on the company, industry and financing conditions. Note that this is a combination table of tables A16 – A18 in the appendix. Panels A, B and C are different models including the different conditions. The first stage selection equations can be found in section 4.3.3 and are equation (21), (22) and (23) for the company, industry and financing condition regressions, respectively. Robust standard errors are in parentheses and are clustered on a 4-digit NACE level. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Δ in ROA	(2) Δ in ROA	(3) Δ in ROA
Panel A: Company Conditions			
Operating Revenue (ln) (strategy)	-15.800***	-15.596***	-15.721***
	(5.24)	(5.24)	(5.51)
Relative Capacity Utilization	-5.956**	-6.266**	-6.122**
	(2.88)	(2.93)	(3.03)
Relative Size	0.003	0.003	0.003
	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	20.520	21.459	15.432
	(26.79)	(26.80)	(26.94)
Return on Sales (follow-on)	1.379	1.164	2.477
	(3.76)	(3.78)	(3.75)
Return on Assets (follow-on)	-46.627**	-47.387**	-49.151**
	(19.26)	(19.29)	(19.10)
N# of follow-ons	1.135	0.998	-0.892
	(3.31)	(3.32)	(3.42)
Observations	158	158	158
Panel B: Industry Conditions			
Inv. Herfindahl Top (ln)	11.886**	12.186**	13.097**
	(5.40)	(5.46)	(5.71)
Inv. Herfindahl Mid (ln)	-6.167	-6.501	-8.840
	(5.52)	(5.59)	(5.64)
Inv. Herfindahl Bottom (ln)	4.830	5.184	3.648
	(5.66)	(5.75)	(6.66)
Market Volatility	-0.192*	-0.196*	-0.120
	(0.00)	(0.00)	(0.00)
Market Growth (%)	6.175	6.112	11.056
	(9.93)	(9.92)	(9.94)
Market Size (ln)	4.914	4.810	9.289**
	(4.01)	(4.02)	(4.46)
Observations	304	304	304
Panel C: Financing Conditions			
FTSE 350 Index	0.004**	0.004*	0.004**
	(0.00)	(0.00)	(0.00)
LIBOR	-5.360*	-5.427*	-4.304
	(3.09)	(3.15)	(3.23)
Spread (HighYield – LIBOR)	2.874	3.008	3.095
	(2.25)	(2.37)	(2.40)
Exchange Rate	-299.999**	-305.943**	-271.758*
	(144.47)	(148.07)	(152.31)
GDP Growth	836.067	827.898	567.693
	(692.14)	(693.09)	(689.01)
Observations	304	304	304
Controls	NO	YES	YES
Industry FE	NO	NO	YES

Table 10 provides the results for the Heckman two step selection models. Again, the different panels account for different regressions including other conditions, the table does not show single regressions. So, in this sense, table 10 is a replication of the ROA models from tables 5,6 and 7 from sections 5.1-5.3 but now with the Heckman correction included. The use of this table is to see whether the results from sections 5.1 to 5.3 still hold with this correction. As column 3 is the full specification which includes the fixed effects and controls, the focus relies on this model.

Regarding the company conditions, the results are consistent with the prior findings. The coefficients do not change sign and correspond more or less in magnitude. The statistical significance of the prior found relationships has even improved. The negative coefficient of the accumulated operating revenue now shows statistical significance at the 1% level and both the negative coefficient for the relative capacity utilization as well as the negative coefficient for the average ROA ratio for the follow-ons now show statistical significance at the 5% level which reassures the previous findings. When it comes to the industry conditions, the results are also gradually the same as previously found which is reassuring. The signs, magnitude and significance correspond with those from table 5.3. Regarding the financing conditions in panel C, the results again display similarity with the prior found relationships. The coefficients show the same signs and roughly the same magnitude. The results now show statistical significance for the negative exchange rate coefficient at the 10% level.

In all, the Heckman correction for the possible causation between conditions and the decision to exit improved the previous model, reassured its results and provided more statistical evidence for the prior found relationships. Hence, we can rest on the interpretation of sections 5.1 to 5.4.

6 Conclusion

This study aimed to examine whether the optimal conditions for the prevalence of buy-and-build strategies at the time of acquisition also resulted in a better performance of the strategy in terms of operating performance of the portfolio firms.

The findings of this paper support the three hypotheses on the optimal conditions for the operating performance of buy-and-build strategies, which are based on past research conducted by Borell and Heger (2013) and Bansraj and Smit (2017). With respect to hypothesis

one regarding the company conditions, the results support the idea that strategy performance is improved through the possibility of reallocation of resources and capacity utilization and by acquiring improvable follow-ons. Moreover, the results show evidence of a size effect where smaller strategies in terms of operating revenue outperform bigger strategies. More interestingly, the number of follow-ons does not seem to affect strategy performance. Hence, this suggests that buy-and-build strategies do not manage to increase performance by exploiting economies of scale. Furthermore, the results do not find statistically significant evidence that follow-ons need to be sizable relative to the platform in order to add value.

The results in this paper also support hypothesis two on the industry conditions. More specifically, this study finds supportive evidence that a more fragmented market at the time of the platform acquisition results in an improvement in operating performance during the strategy. This seems intuitive as this is achieved through more acquisition options increasing the probability of suitable follow-on options. Furthermore, sizable markets are found to be positively related with the strategy performance supporting the proposition that such markets provide a good basis for the improvement of operating performance.

When it comes to the financing conditions, the results generally support the third hypothesis that financing conditions at the time of the acquisition improve the operating performance of buy-and-build strategies. The performance of a strategy is higher when the market valuation is higher, and the exchange rate is negatively related to the strategy performance. With respect to the market valuation, the market ought to be valued with realistic expectations, also in the long term. Through this, industries with high market valuations at the time of acquisition have a higher potential to grow during the strategy. Regarding to the exchange rate, a lower currency price (we do not talk about appreciation as we do not observe a time-relative price) is associated with an increase in the strategy performance. This is consistent with expectations as it probably increases the possibility of internal financing and increases the debt capacity.

This study also showed that while some of these conditions seems to enhance strategy performance in terms of the change in return on assets (ROA), it did not always do so in other measures of performance such as the return on sales (ROS) and asset turnover (ATR) and vice versa. If beneficial for the ROA, but not the others, this means that these conditions seem to be improving the possibility of profit generation, but not in terms of revenue generation (ATR)

or retaining profit after subtracting operating costs (ROS). The size effect has been reversed when the performance measure has been interchanged with the change in asset turnover (ATR) meaning that larger strategies are able to increase the sales relative to the assets but not the profit.

Moreover, this paper checked whether these conditions affected the decision to exit and the duration of the strategy. This is because PE firms tend to exit a strategy when profitable and thus successful creating a selection bias in the sample. The results provided insights that, only the size of the strategy from the company conditions seemed to affect the decision to exit a bit, which is not surprising. Moreover, the average return on assets for the follow-ons seemed to positively affect the duration of the strategy in terms of leaning towards an exit quicker. This as well is predictable as it is probably profitable to exit when a high average ROA is achieved. Nonetheless, the prior found results gradually still hold when this bias was accounted for using the two step Heckman selection model increasing the plausibility of the found relationships. Nonetheless, this still induces limited inferences about the results as the decision to exit is probably related to the dependent variable limiting out-of-sample inference. There is another possibility that a survivorship bias exists in this dataset. This could be because smaller firms or underperforming firms are underreported in terms of financial data. The latter is reasonable since private equity firms would like to advertise with a success story instead of failing or underperforming companies.

As beforementioned, the results of this paper add to three different bodies of literature; (1) the performance of private equity firms, (2) the value drivers in private equity, and (3) the literature on the optimal conditions of buy-and-build strategies. This study differs itself from previous literature by testing whether the company, industry and financing occurrence conditions for buy-and-build strategies proposed by the latter body of literature are beneficial for the improvement of operating performance of the strategies and hence can be added to the second body of literature on the value drivers of private equity and more specifically, buy-and-build strategies. This study thereby complements all three bodies of literature. To the best of knowledge, this is the first paper to empirically address the effect of conditions on the exit performance of buy-and-build strategies. Hence it lays the groundwork for further research on this subject and the empirically supported value drivers of buy-and-build strategies within private equity. Not only does this study help the academic world understand the mechanisms

of buy-and-build strategies and its value-creating mechanisms better, it also provides practical insights for private equity firms looking for the best targets to acquire and investors judging private equity funds and predicting future returns.

While this study tries to account for the possible affecters of the decision to exit as it could be related to the independent variables, there is still a lot of empirical research to do within this field. First of all, the reason to exit is likely to be affected by the dependent variable in this sample. Hence, extension could be to create a panel dataset with a yearly observation of the y variable per strategy that either exited or not. Then, one could observe indeed if it is the optimal timing in terms of performance that makes PE firms exit the strategy. Henceforth, selection bias to exit could be accounted for when examining the effect of the pre-acquisition conditions on the strategy performance. Unfortunately, the availability of data is most likely to be a problem for such a dataset. Secondly, this study accounts for the conditions at the time of the acquisition affecting the decision to exit. However, it is expected that industry and market conditions at the potential time of an exit affect the actual decision to exit. Hence, such an extension could clarify this effect and correctly adjust for it. Another question that is raised alongside these results is not on how to buy, but on how to sell in terms of operating performance as well as return performance as these are major influencers of strategy performance in the end. Another aspect for future research is with respect to the reallocation of resources and capacity utilization between platforms and follow-ons. This paper examines average follow-on characteristics as well as full strategy accumulated operating performance. A more specific study on this subject with the use of separate analysis on the different follow-on should provide meaningful insights into the dynamics of perfect strategy targets. Without question, there is a lot more to study within this field with this study as a bedrock for future research.

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A Appendix

Figure A1: Buy-and-build strategy value creation. This figure simplifies how value is created in a buy-and-build strategy consisting of a platform and two follow-on acquisitions compared to three stand-alone buyouts. The figure is an extension of Hoffman, 2004, p. 23.

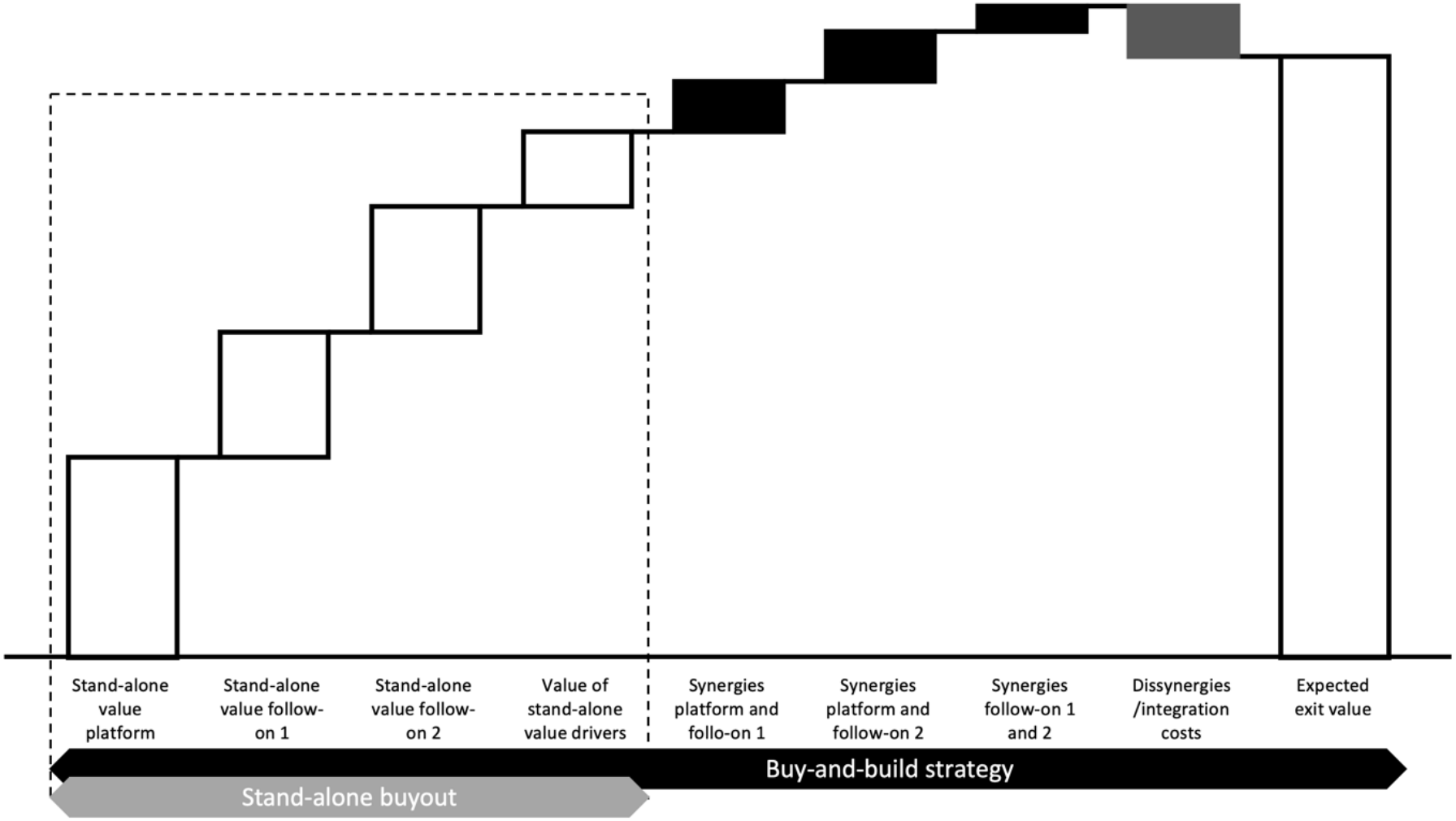
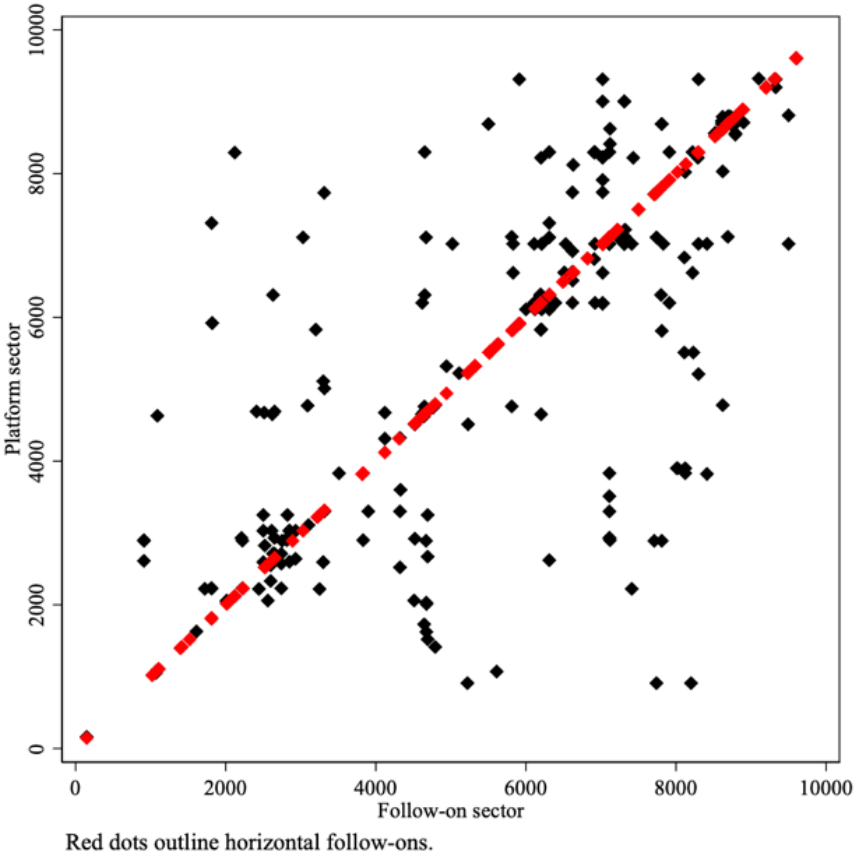
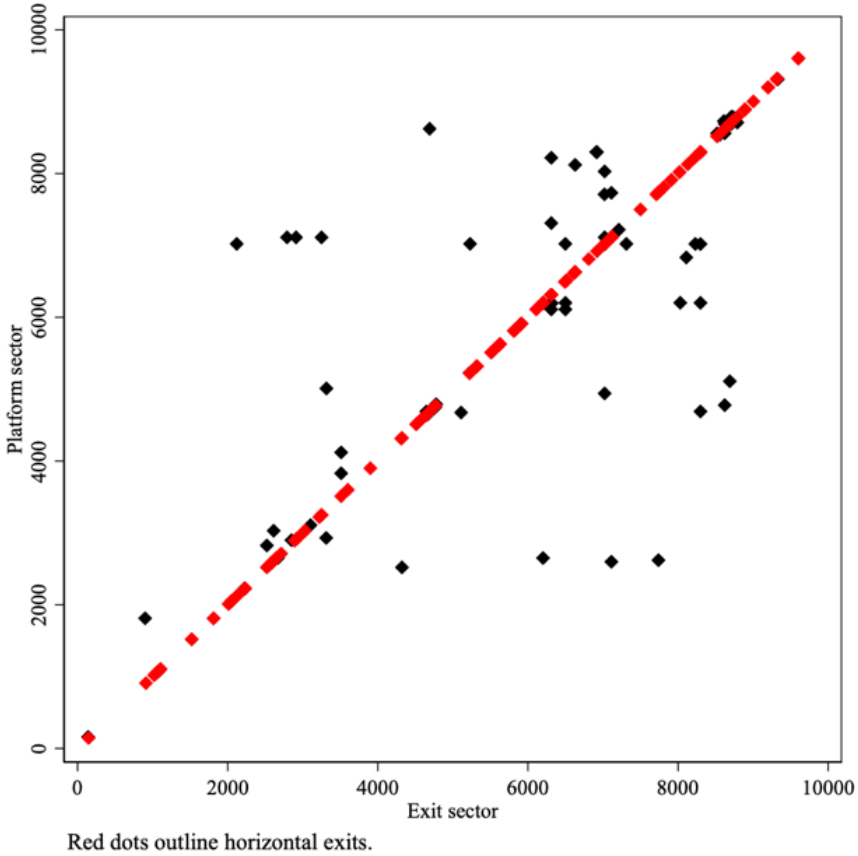


Figure A2: Industry combinations. This figure describes the distribution and frequency of the platform, follow-on and exit deal sector combinations. Both axes show the 4-digit level NACE codes.

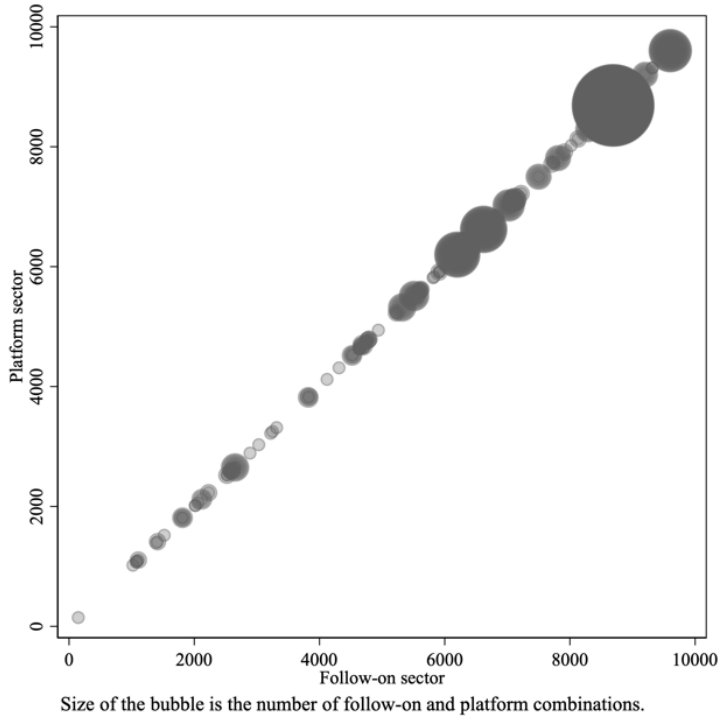


Panel A: Platform and follow-on sectors

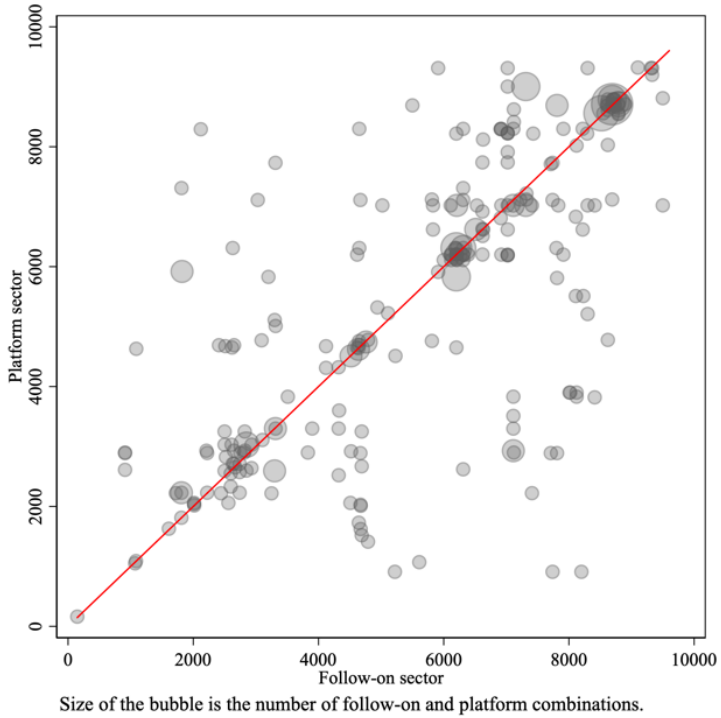


Panel B: Platform and exit sectors

Figure A3: Vertical and horizontal combinations. This figure describes the frequency of horizontal and vertical industry combinations, respectively. The sectors are determined by a 4-digit NACE code. The 45° red line in Panel B serves as a reference for the same platform and follow-on sector combinations. Here, Panel A aims at the frequency of horizontal acquisitions per sector whereas Panel B aims at the frequency of vertical acquisition sector combinations. Panel A shows that within this dataset, most of the horizontal follow-on acquisitions occur within sector 8690 which constitutes the classification "Other human health activities" (Eurostat, 2008). This is due to the fact that some big strategies with a lot of follow-ons within this dataset are situated within this sector. Other sizable bubbles in the figure are situated in sectors 6201, 6622 and 9603 which are classified as computer programming activities, activities of insurance agents and brokers, and funeral and related activities, respectively (Eurostat, 2008).

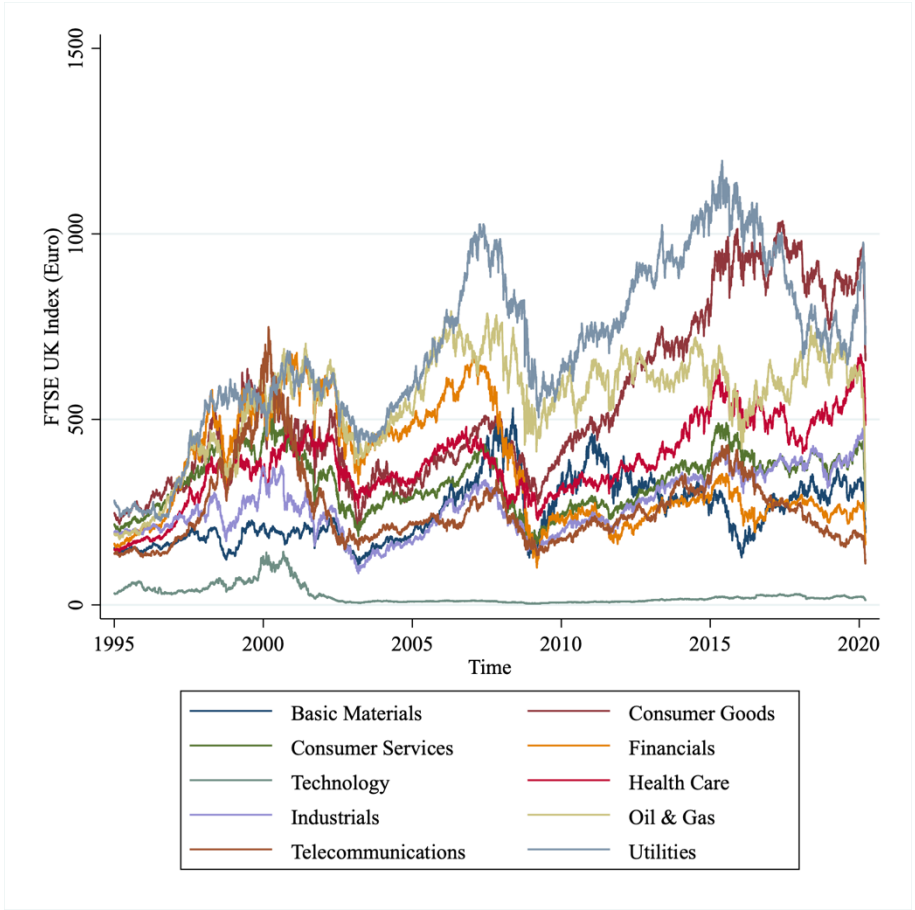


Panel A: Follow-ons per horizontal combination

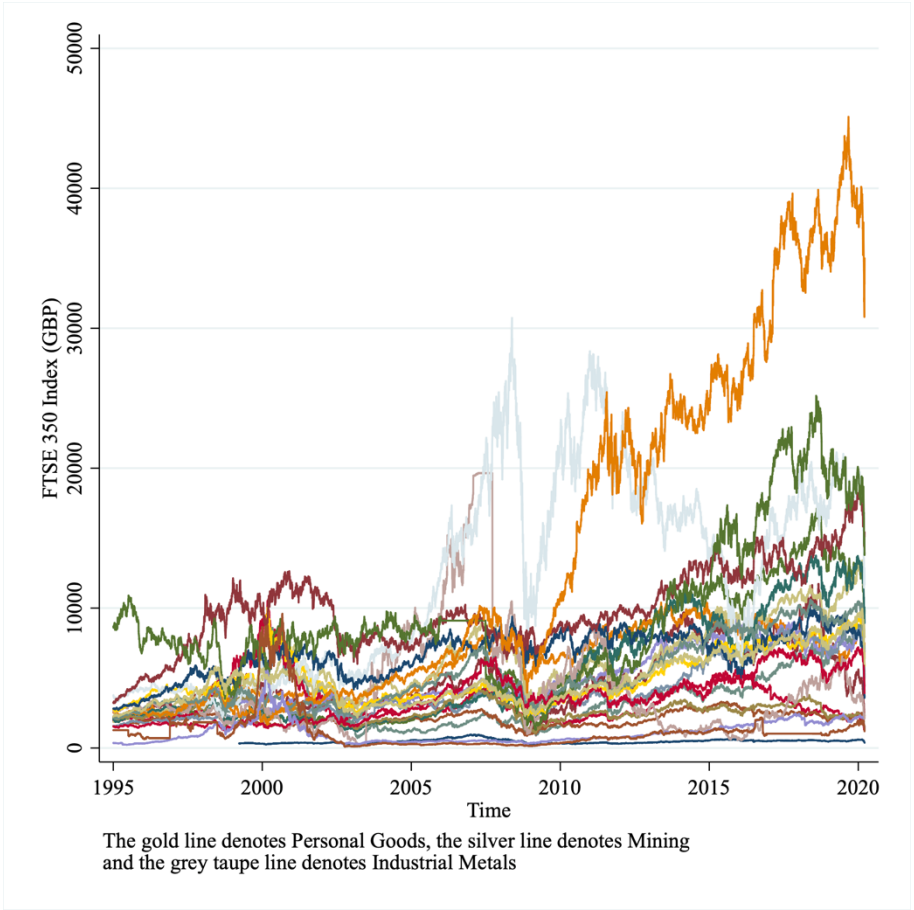


Panel B: Follow-ons per vertical combination

Figure A4: FTSE indices. Panel A on the left shows the general UK FTSE Indices over time. Panel B on the right shows the FTSE 350 Indices over time.

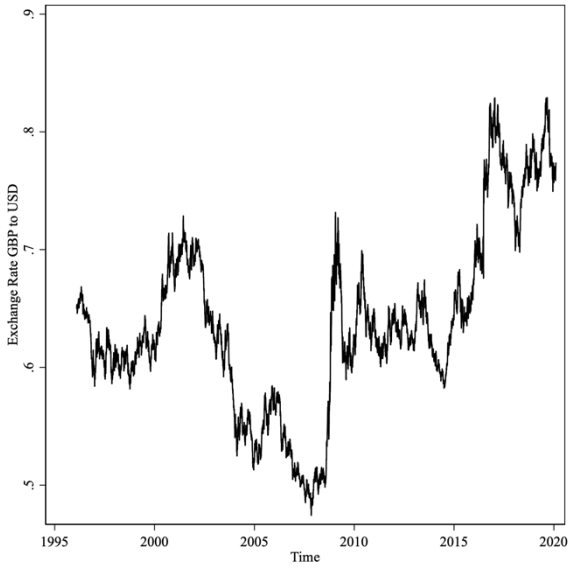


Panel A

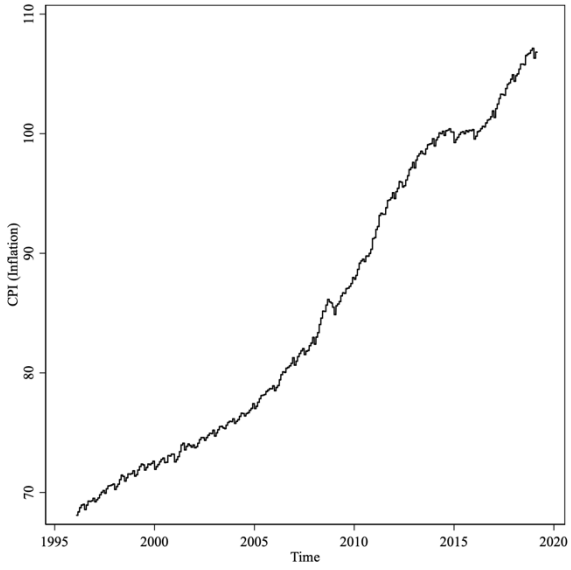


Panel B

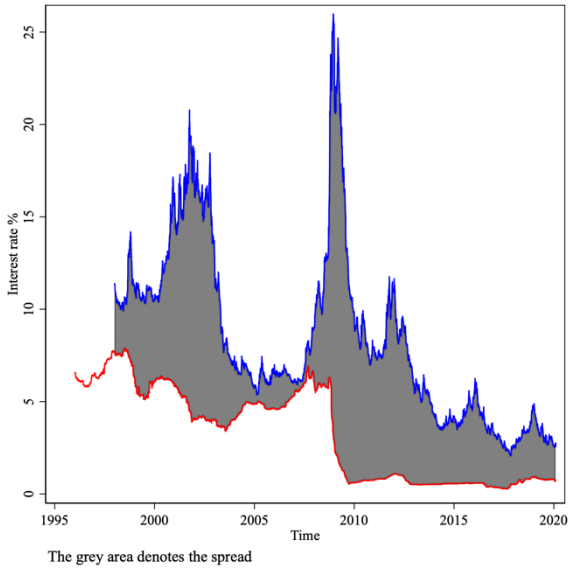
Figure A5: Financing conditions. This figure provides insights on the financing conditions in the UK over time. Panel A shows the GBP to USD exchange rate. Panel B shows the UK Consumer Price Index (CPI) which represents the inflation in the United Kingdom. Panel C shows the 3-month LIBOR, the BofA Euro ICE High Yield Index and the spread which is denoted by the grey area (High Yield – LIBOR). Finally, Panel D shows the UK annualized GDP over time, and quarter and annual GDP growth with the black and blue lines respectively. Note that the percentual growth is measured as QoQ and YoY and is related to the right axis.



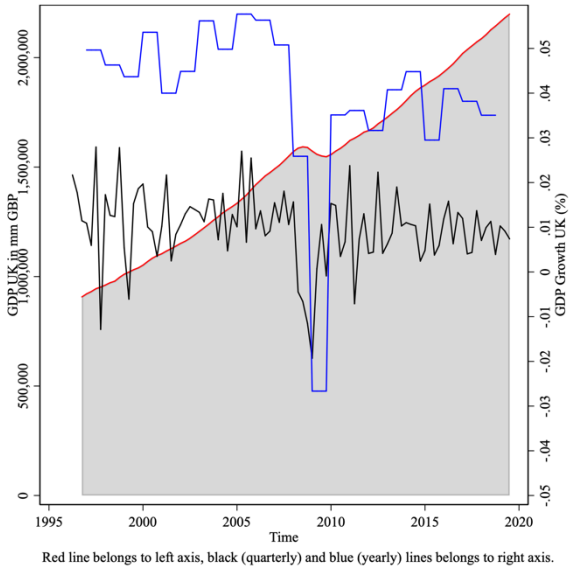
Panel A: GBP-USD Exchange Rate



Panel B: Consumer Price Index



Panel C: LIBOR, High Yield & Spread



Panel D: GDP and GDP growth

Figure A6: Industry market size over time. This figure shows the market size per industry over time. The industry classifications correspond with table A4 (appendix). Market size is measured in quadrillion US Dollars.

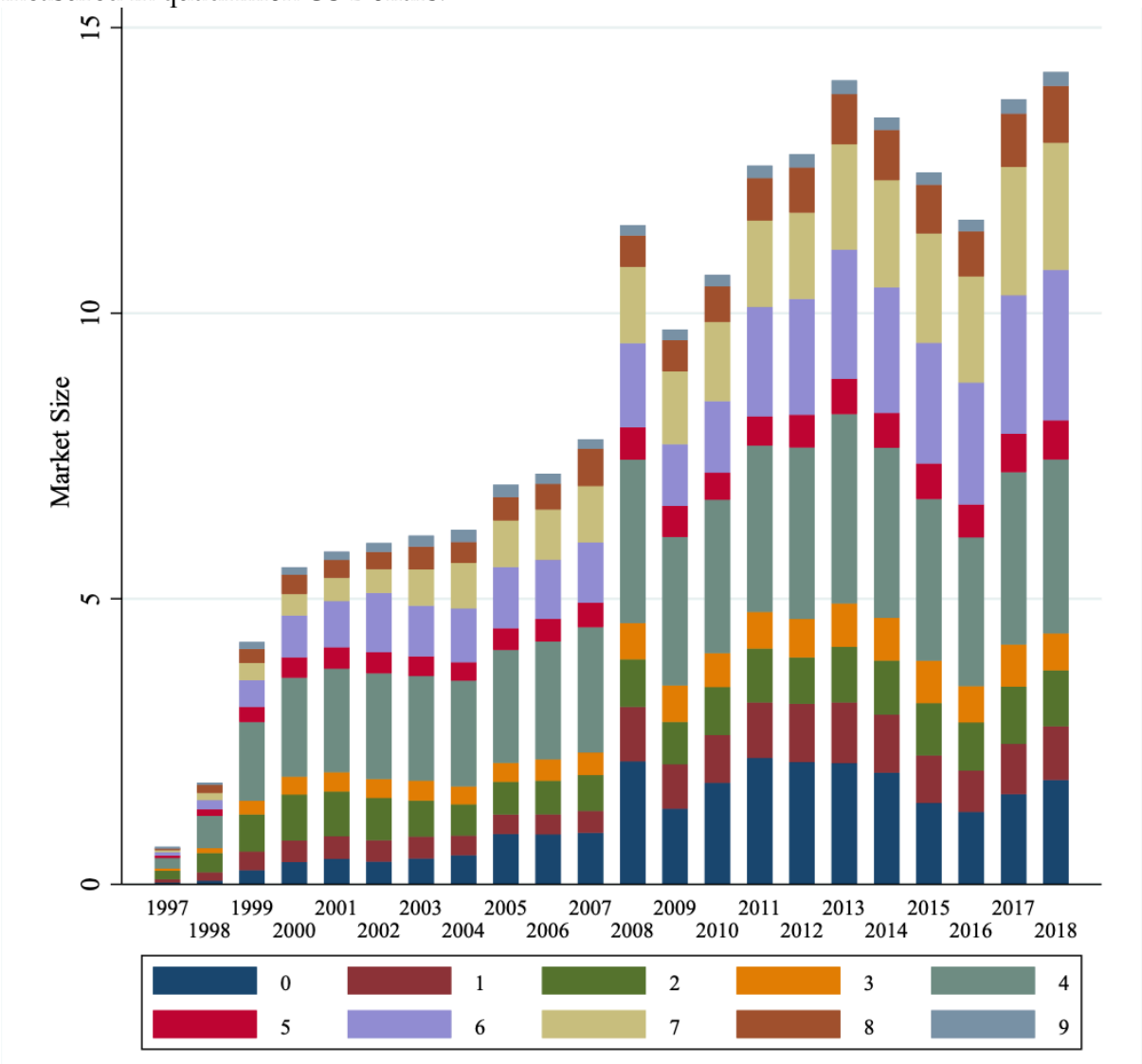


Figure A7: Market concentration over time. This figure shows the market concentration measured using the Herfindahl-Hirschman-Index (HHI) over time. The orange line highlights the specific industry, the grey lines denote the other industries. The industry classification numbers correspond with table A5 (appendix).

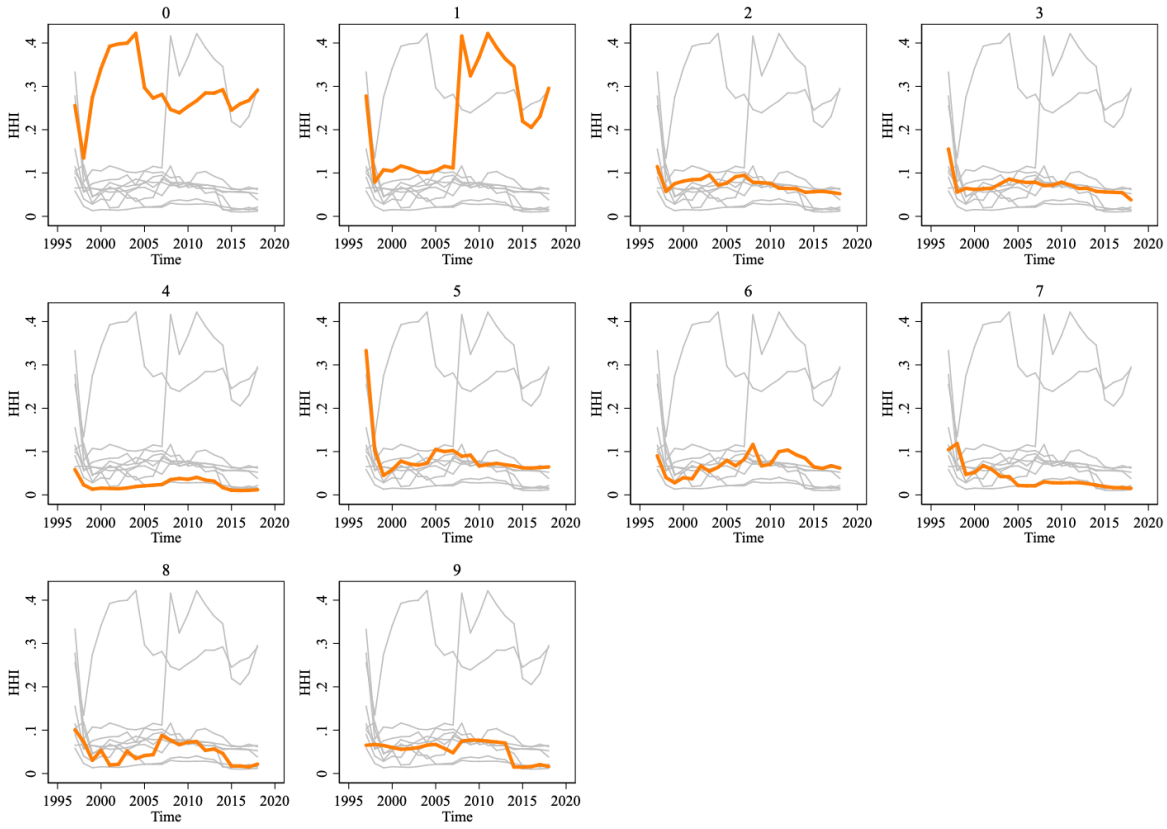
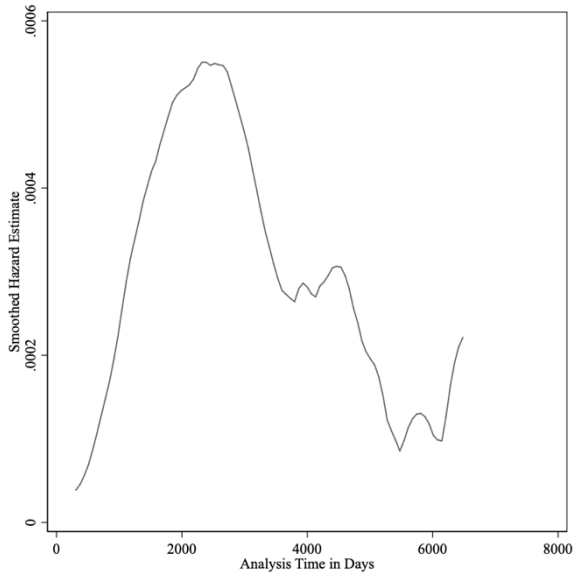
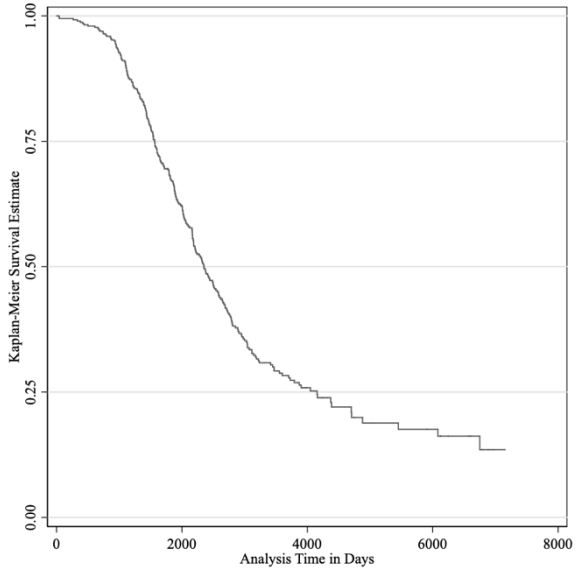


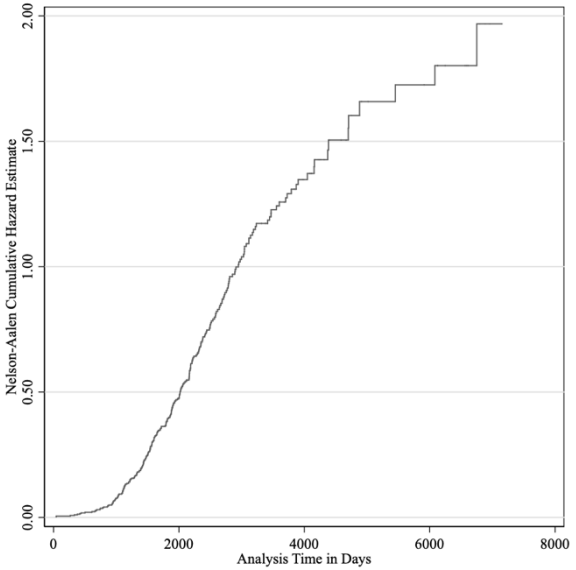
Figure A8: Hazard rates for the exit. This figure shows the hazard rates for the duration of the strategy and the exit. Panel A shows the (smoothed) hazard rate over time from equation (15), the Kaplan-Meier Survival Rate from equation (17) is shown in panel B and Panel C displays the Nelson-Aalen Cumulative Hazard rate (eq. (16)) over the analysis time.



Panel A: Smoothed Hazard Rate



Panel B: Kaplan-Meier Survival Rate



Panel C: Nelson-Aalen Cumulative Hazard Rate

Table A1: Correlation matrices. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

Panel A

	FTSE 350 Index	LIBOR	Spread (HighYield – LIBOR)	Exchange Rate	Inflation	GDP Growth
FTSE 350 Index	1.000					
LIBOR	-0.0777	1.000				
Spread (HighYield – LIBOR)	-0.0820	-0.462***	1.000			
Exchange Rate	-0.0281	-0.584***	0.747***	1.000		
Inflation	0.170**	-0.844***	0.285***	0.262***	1.000	
GDP Growth	0.0439	0.121*	-0.305***	-0.071	-0.217***	1.000

Panel B

	Return on Assets (platform)	Return on Sales (follow-on)	Return on Assets (follow-on)	Operating Revenue (ln) (strategy)	Relative ROA	Total Assets (ln) (strategy)
Return on Assets (platform)	1.000					
Return on Sales (follow-on)	0.115	1.000				
Return on Assets (follow-on)	-0.0274	0.0284	1.000			
Operating Revenue (ln) (strategy)	-0.0757	0.326***	-0.0109	1.000		
Relative ROA	-0.165*	-0.00198	0.00336	0.00231	1.000	
Total Assets (ln) (strategy)	-0.187*	0.0301	-0.0691	0.662***	0.0672	1.000

Panel C

	Inv. Herfindahl (ln)	Inv. Herfindahl Top (ln)	Inv. Herfindahl Mid (ln)	Inv. Herfindahl Bottom (ln)	Market Volatility	Market Growth (%)	Market Size (ln)
Inv. Herfindahl (ln)	1.000						
Inv. Herfindahl Top (ln)	0.999***	1.000					
Inv. Herfindahl Mid (ln)	0.364***	0.359***	1.000				
Inv. Herfindahl Bottom (ln)	0.293***	0.300***	0.804***	1.000			
Market Volatility	-0.0544	-0.0549	0.048	0.0405	1.000		
Market Growth (%)	-0.149**	-0.148**	-0.117*	-0.133*	0.013	1.000	
Market Size (ln)	-0.0951	-0.0945	0.224***	0.244***	0.523***	-0.157**	1.000

Table A2: Summary equation table. This table provides an overview of all the equations in the paper with corresponding page number as well as the equations that were left out of the main text for brevity reasons.

Eq. No.	Equation	Page No.
(1)	$Herfindahl\text{-}Hirschman\ Index\ (HHI) = \sum_{i=1}^{N}\left(\frac{Sales_i}{\sum_{j=1}^{N} Sales_j}\right)^2$	20
(2)	$\Delta ROA_j = \frac{EBIT_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(EBIT_{t=exit}^{F_{ij}}\right)}{Assets_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=exit}^{F_{ij}}\right)} - \frac{EBIT_{t=0}^{P_j} + \sum_{i=1}^{N}\left(EBIT_{t=0}^{F_{ij}}\right)}{Assets_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=0}^{F_{ij}}\right)}$	26
(3)	$\Delta ROS_j = \frac{EBIT_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(EBIT_{t=exit}^{F_{ij}}\right)}{Turnover_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(Turnover_{t=exit}^{F_{ij}}\right)} - \frac{EBIT_{t=0}^{P_j} + \sum_{i=1}^{N}\left(EBIT_{t=0}^{F_{ij}}\right)}{Turnover_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Turnover_{t=0}^{F_{ij}}\right)}$	26
(4)	$\Delta SOA_j = \frac{Turnover_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(Turnover_{t=exit}^{F_{ij}}\right)}{Assets_{t=exit}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=exit}^{F_{ij}}\right)} - \frac{Turnover_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Turnover_{t=0}^{F_{ij}}\right)}{Assets_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=0}^{F_{ij}}\right)}$	27
(5)	$\Delta ROA_j = \alpha + \beta_1 Company\ Conditions_{ij} + \beta_2 \boldsymbol{X}_{ij} + \eta_f + \varepsilon_{ij}$	27
(6)	$Relative\ Size = \frac{Turnover_{Platform}}{\left(\frac{\sum_{i=1}^{N} Turnover_{Follow\text{-}on}}{N}\right)}$	28
(7)	$Relative\ Capacity\ Utilization = \frac{ATR_{Platform}}{\left(\frac{\sum_{i=1}^{N} ATR_{Follow\text{-}on}}{N}\right)}$	28
(8)	$\Delta ROA_j = \alpha + \beta_1 Industry\ Conditions_{ijf} + \beta_2 \boldsymbol{X}_{ij} + \eta_f + \varepsilon_{ijf}$	28

Table A2: Summary equation table. Continued

Eq. No.	Equation	Page No.
(9)	$\Delta ROA_j = \alpha + \beta_1 Financing\ Conditions_{ij} + \beta_2 \boldsymbol{X}_{ijf} + \eta_f + \varepsilon_{ijf}$	29
(10)	$\Delta ROA_j = \alpha + \beta_1 Company\ Conditions_{ij} + \beta_2 Industry\ Conditions_{ijf} + \beta_3 Financing\ Conditions_{ij} + \beta_4 \boldsymbol{X}_{ijf} + \eta_f + \varepsilon_{ijf}$	29
(11)	$Size\ effect\ control = \ln\left(Assets_{t=0}^{P_j} + \sum_{i=1}^{N}\left(Assets_{t=0}^{F_{ij}}\right)\right)$	30
(12)	$\Pr\left(Exit_{ij} = 1 \,\middle|\, Company\ Conditions_{ij}, \boldsymbol{X}_{ij}\right) = \Phi(a_1 Company\ Conditions_{ij}, + a_2 \boldsymbol{X}_{ij})$	31
(13)	$\Pr\left(Exit_{ij} = 1 \,\middle|\, Industry\ Conditions_{ij}, \boldsymbol{X}_{ij}\right) = \Phi(a_1 Industry\ Conditions_{ijf}, + a_2 \boldsymbol{X}_{ij})$	31
(14)	$\Pr\left(Exit_{ij} = 1 \,\middle|\, Financing\ Conditions_{ij}, \boldsymbol{X}_{ij}\right) = \Phi(a_1 Financing\ Conditions_{ij}, + a_2 \boldsymbol{X}_{ij})$	31
(15)	$\lambda(t) = \frac{f(t)}{S(t)} \Rightarrow \lambda(t_j) = \frac{d_j}{n_j}$	32
(16)	$\Lambda(t_j) = \sum \frac{d_j}{n_j}$	32

Table A2: Summary equation table. Continued

Eq. No.	Equation	Page No.
(17)	$S(t_j) = \prod \frac{n_j - d_j}{n_j}$	33
(18)	$\lambda(t\|\|Conditions_i) = \lambda_0(t)\exp(\beta \cdot Conditions_i)$	33
(19)	$Strategy\ Performance_j = \beta_1 + \beta_2 Conditions_j + e_j$	33
(20)	$z_j^* = \gamma_1 + \gamma_2 w_j + u_j$	33
(21)	$\Pr(Exit_j = 1 \mid Strategy\ Turnover_j + Relative\ Capacuty\ Utilization_j + Relative\ size_j + Strategy\ Length_j) = \Phi(a_1 Strategy\ Turnover_j + a_2 Relative\ Capacuty\ Utilization_j + a_3 Relative\ size_j + a_4 Strategy\ Length_j)$	34
(22)	$\Pr(Exit_{jft} = 1 \mid Inverted\ HHI\ Bottom_{ft} + Market\ Volatility_{ft} + Market\ Growth_{ft} + Strategy\ Length_j) = \Phi(a_1 Inverted\ HHI\ Bottom_{ft} + a_2 Market\ Volatility_{ft} + a_3 Market\ Growth_{ft} + a_4 Strategy\ Length_j)$	34
(23)	$\Pr(Exit_{ij} = 1 \mid LIBOR_t + GDP\ Growth_t + Strategy\ Length_j) = \Phi(a_1 LIBOR_t + a_2 GDP\ Growth_t + a_3 Strategy\ Length_j)$	34
(24)	$Estimated\ Inverse\ Mills\ Ratio\ (IMR) = \tilde{\lambda}_j = \frac{\phi(\tilde{\gamma}_1 + \tilde{\gamma}_2 w_j)}{\Phi(\tilde{\gamma}_1 + \tilde{\gamma}_2 w_j)}$	34

Table A2: Summary equation table. Continued

Eq. No.	Equation	Page No.
(25)	$Strategy\ Performance_j = \beta_1 + \beta_2 Conditions_j + \beta_3 \boldsymbol{X}_{ij} + \beta_\lambda \tilde{\lambda}_j + e_j$	34
(26)	$Strategy\ length = \begin{cases} Exit\ date - start\ date, & Exit = 1 \\ Sample\ end\ date - start\ date, & Exit = 0 \end{cases}$	48
(A1)	$Inverted\ Herfindahl\text{-}Hirschman\ Index\ (HHI) = \frac{1}{\sum_{i=1}^{N}\left(\frac{Sales_i}{\sum_{j=1}^{N} Sales_j}\right)^2}$	N/A
(A2)	$Inverse\ Mills\ Ratio\ (IMR) = \lambda_i = \frac{\phi(\gamma_1 + \gamma_2 w_i)}{\Phi(\gamma_1 + \gamma_2 w_i)}$	N/A

Table A3: Performance measures descriptive statistics. This table shows the difference in statistics for the different performance measures.

	Observations	Mean	Standard Deviation	Minimum	Maximum
Panel A: Unwinsorized dependent variables					
Δ in ROA	196	5.83	200.43	-698.06	2,435.93
Δ in ROS	183	-0.01	7.39	-74.71	63.34
Δ in ATR	184	-9.35	80.49	-813.72	7.33
Panel B: Winsorized dependent variables					
Δ in ROA	196	-2.18898	77.39269	-220.0779	475.20
Δ in ROS	183	0.0402122	0.438389	-0.8391081	2.584735
Δ in ATR	184	-1.696182	9.22323	-64.98393	4.614288

Table A4: 1-Digit industry classification. This table assigns an industry number to every industry classification which is to be used in order to assess figures A6 and A7 (appendix). These 1-digit industry classifications have been provided by the European Commission.

Industry	Specification
0	Agriculture, forestry and fishing
1	Manufacturing, mining and quarrying and other industry
2	Construction
3	Wholesale and retail trade, transportation and storage, accommodation and food service activities
4	Information and communication
5	Financial and insurance activities
6	Real estate activities
7	Professional, scientific, technical, administration and support service activities
8	Public administration, defence, education, human health and social work activities
9	Other Services

Table A5: NACE to FTSE 350 linking table. This table links the NACE Industry reference codes to the FTSE 350 sector indices. It is based on the classification from Eurostat (https://ec.europa.eu/eurostat).

Group	A*38 Code	NACE 2 Divisions	Market	FTSE Top Index	FTSE Top Index Code	FTSE Sub Index	FTSE Sub Index Code
1	A	1-3	Agriculture, forestry and fishing	Basic Materials	F1UKBME	Forestry & Paper	FT33PF£
2	B	5-9	Mining and quarrying	Basic Materials	F1UKBME	Mining	FT33MM£
3	CA	10-12	Manufacture of food products, beverages and tobacco products	Consumer Goods	F1UKCGE	Food Producers	FT33FC£
4	CB	13-15	Manufacture of textiles, apparel, leather and related products	Consumer Goods	F1UKCGE	Personal Goods	FT33PG£
5	CC	16-18	Manufacture of wood and paper products, and printing	Basic Materials	F1UKBME	Forestry & Paper	FT33PF£
6	CD	19	Manufacture of coke, and refined petroleum products	Oil & Gas	F1UKO1E	Oil & Gas Producers	FT33OG£
7	CE	20	Manufacture of chemicals and chemical products	Basic Materials	F1UKBME	Chemicals	FT33C3£
8	CF	21	Manufacture of pharmaceuticals, medicinal chemical and botanical products	Health Care	F1UKH1E	Pharmaceuticals & Biotechnology	FT33PB£
9	CG	22-23	Manufacture of rubber and plastics products, and other non-metallic mineral products	Industrials	F1UKIDE	Construction & Materials	FT33S3£
10	CH	24-25	Manufacture of basic metals and fabricated metal products, except machinery and equipment	Basic Materials	F1UKBME	Industrial Metals	FT33IU£
11	CI	26	Manufacture of computer, electronic and optical products	Technology	F1UKG1E	Technology Hardware & Equipment	FT33TH£
12	CJ	27	Manufacture of electrical equipment	Industrials	F1UKIDE	Electronics & Electrical Equipment	FT33EL£
13	CK	28	Manufacture of machinery and equipment n.e.c.	Industrials	F1UKIDE	Industrial Engineering	FT33IE£
14	CL	29-30	Manufacture of transport equipment	Industrials	F1UKIDE	Industrial Transportation	FT33IP£
15	CM	31-33	Other manufacturing, and repair and installation of machinery and equipment	Industrials	F1UKIDE	Industrial Engineering	FT33IE£
16	D	35	Electricity, gas, steam and air-conditioning supply	Utilities	F1UKU1E	Electricity	FT33E3£
17	E	36-39	Water supply, sewerage, waste management and remediation	Utilities	F1UKU1E	Support Services	FT33SV£
18	F	41-43	Construction	Industrials	F1UKIDE	Construction & Materials	FT33S3£
19	G	45-47	Wholesale and retail trade, repair of motor vehicles and motorcycles	Consumer Goods	F1UKCGE	Automobiles & Parts	FT33A3£

Table A5: NACE to FTSE 350 linking table. Continued.

Group	A*38 Code	NACE 2 Divisions	Market	FTSE Top Index	FTSE Top Index Code	FTSE Sub Index	FTSE Sub Index Code
20	H	49-53	Transportation and storage	Industrials	F1UKIDE	Industrial Transportation	FT33IP£
21	I	55-56	Accommodation and food service activities	Consumer Services	F1UKCSE	Travel & Leisure	FT33R3£
22	JA	58-60	Publishing, audio-visual and broadcasting activities	Consumer Services	F1UKCSE	Media	FT33M3£
23	JB	61	Telecommunications	Telecommunications	F1UKT1E	Fixed Line Telecommunications	FT33F3£
24	JC	62-63	IT and other information services	Technology	F1UKG1E	Software & Computer Services	FT33SS£
25	K	64-66	Financial and insurance activities	Financials	F1UKFNE	Financial Services	FT33GF£
26	L	68	Real estate activities*	Financials	F1UKFNE	Real Estate	FT32RL£
27	MA	69-71	Legal, accounting, management, architecture, engineering, technical testing and analysis activities	Industrials	F1UKIDE	Support Services	FT33SV£
28	MB	72	Scientific research and development	Industrials	F1UKIDE	Support Services	FT33SV£
29	MC	73-75	Other professional, scientific and technical activities	Industrials	F1UKIDE	Support Services	FT33SV£
30	N	77-82	Administrative and support service activities	Industrials	F1UKIDE	Support Services	FT33SV£
31	O	84	Public administration and defence, compulsory social security	Industrials	F1UKIDE	Support Services	FT33SV£
32	P	85	Education	Consumer Goods	F1UKCGE	Personal Goods	FT33PG£
33	QA	86	Human health services	Health Care	F1UKH1E	Health Care Equipment & Services	FT33HE£
34	QB	87-88	Residential care and social work activities	Consumer Services	F1UKCSE	Travel & Leisure	FT33R3£
35	R	90-93	Arts, entertainment and recreation	Consumer Services	F1UKCSE	Travel & Leisure	FT33R3£
36	S	94-96	Other services	Industrials	F1UKIDE	Support Services	FT33SV£
37	T**	97-98	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	Consumer Services	F1UKCSE	General Retailers	FT33GR£
38	U**	99	Activities of extra-territorial organisations and bodies	Industrials	F1UKIDE	Support Services	FT33SV£

Table A6: NACE to FTSE 350 sector paths. This table shows the paths that were made to end up with the FTSE 350 sub classification.

Group	Market	Path
1	Agriculture, forestry and fishing	Basic Resources: Forestry & Paper
2	Mining and quarrying	Basic Resources: Mining
3	Manufacture of food products, beverages and tobacco products	Consumer Good: Food & Beverage: Food Producers
4	Manufacture of textiles, apparel, leather and related products	Consumer Goods: Personal & Household Goods: Personal Goods
5	Manufacture of wood and paper products, and printing	Basic Resources: Forestry & Paper
6	Manufacture of coke, and refined petroleum products	Oil & Gas: Oil & Gas Producers
7	Manufacture of chemicals and chemical products	Basic Materials: Chemicals: Chemicals
8	Manufacture of pharmaceuticals, medicinal chemical and botanical products	Health Care: Health Care: Pharmaceuticals & Biotechnology
9	Manufacture of rubber and plastics products, and other non-metallic mineral products	Industrials: Construction & Materials
10	Manufacture of basic metals and fabricated metal products, except machinery and equipment	Basic Materials: Basic Resources: Industrial Metals
11	Manufacture of computer, electronic and optical products	Technology: Technology: Technology Hardware & Equipment
12	Manufacture of electrical equipment	Industrials: Industrial Goods & Services: Electronics & Electrical Equipment
13	Manufacture of machinery and equipment n.e.c.	Industrials: Industrial Goods & Services: Industrial Engineering
14	Manufacture of transport equipment	Industrials: Industrial Goods & Services: Industrial Transportation
15	Other manufacturing, and repair and installation of machinery and equipment	Industrials: Industrial Goods & Services: Industrial Engineering
16	Electricity, gas, steam and air-conditioning supply	Utilities: Utilities: Electricity
17	Water supply, sewerage, waste management and remediation	Industrials: Industrial Goods & Services: Support Services
18	Construction	Industrials: Construction & Materials
19	Wholesale and retail trade, repair of motor vehicles and motorcycles	Consumer Goods: Automobiles & Parts: Automobiles & Parts

Table A6: NACE to FTSE 350 sector paths. Continued.

Group	Market	Path
20	Transportation and storage	Industrials: Industrial Goods & Services: Industrial Transportation
21	Accommodation and food service activities	Consumer Services: Travel & Leisure: Travel & Leisure
22	Publishing, audiovisual and broadcasting activities	Consumer Services: Media: Media
23	Telecommunications	Telecommunications: Telecommunications: Fixed Line Telecommunications
24	IT and other information services	Technology: Technology: Software & Computer Services
25	Financial and insurance activities	Financials: Financial Sercices: Financial Services
26	Real estate activities*	Financials: Financials Services: Real Estate
27	Legal, accounting, management, architecture, engineering, technical testing and analysis activities	Industrials: Industrial Goods & Services: Support Services
28	Scientific research and development	Industrials: Industrial Goods & Services: Support Services
29	Other professional, scientific and technical activities	Industrials: Industrial Goods & Services: Support Services
30	Administrative and support service activities	Industrials: Industrial Goods & Services: Support Services
31	Public administration and defence, compulsory social security	Industrials: Industrial Goods & Services: Support Services
32	Education	Consumer Goods: Personal & Household Goods: Personal Goods
33	Human health services	Health Care: Health Care: Healh Care Equipment & Services
34	Residential care and social work activities	Consumer Services: Travel & Leisure: Travel & Leisure
35	Arts, entertainment and recreation	Consumer Services: Travel & Leisure: Travel & Leisure
36	Other services	Industrials: Industrial Goods & Services: Support Services
37	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	Consumer Services: Retail: General Retailers
38	Activities of extra-territorial organisations and bodies	Industrials: Industrial Goods & Services: Support Services

Table A7: OLS regression for all conditions. Robust standard errors are in parentheses and are clustered on a 4-digit NACE level. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Change in ROA	(2) Change in ROA	(3) Change in ROA	(4) Change in ROA	(5) Change in ROS	(6) Change in ATR
Operating Revenue (ln) (strategy)	-17.522**	-17.689**	-21.235**	-21.088**	-0.015	1.162
	(7.21)	(7.34)	(8.24)	(8.36)	(0.04)	(0.71)
Relative Capacity Utilization	-8.384**	-8.352**	-7.977**	-7.930**	-0.013	-0.424
	(3.22)	(3.28)	(3.53)	(3.57)	(0.02)	(0.31)
Relative Size	0.003	0.003	0.002	0.002	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	0.986	0.510	-14.617	-14.233	-0.161	5.278*
	(31.35)	(31.84)	(34.34)	(34.71)	(0.18)	(2.98)
Return on Sales (follow-on)	3.565	3.542	8.536	8.737	-0.105***	2.715***
	(6.40)	(6.49)	(7.31)	(7.48)	(0.04)	(0.63)
Return on Assets (follow-on)	-34.591	-34.435	-33.657	-33.849	-0.075	-2.870
	(21.59)	(22.20)	(24.56)	(24.78)	(0.13)	(2.13)
Inv. Herfindahl Top (ln)	24.318**	24.557**	21.117*	21.541*	-0.007	1.196
	(9.36)	(9.80)	(11.33)	(11.74)	(0.06)	(1.00)
Inv. Herfindahl Mid (ln)	-6.306	-6.654	-14.955	-15.235	-0.034	-0.173
	(9.89)	(10.16)	(11.06)	(11.30)	(0.06)	(0.97)
Inv. Herfindahl Bottom (ln)	9.023	9.211	15.351	15.893	0.050	-1.003
	(10.30)	(10.47)	(13.32)	(13.88)	(0.07)	(1.16)
Market Volatility	-0.059	-0.060	-0.014	-0.020	-0.002	-0.014
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market Growth (%)	41.154	42.804	55.570*	55.720*	0.036	5.624**
	(27.84)	(28.90)	(30.99)	(31.25)	(0.16)	(2.71)
Market Size (ln)	3.417	3.459	6.106	6.054	0.010	1.991**
	(7.06)	(7.25)	(8.71)	(8.78)	(0.05)	(0.81)
FTSE 350 Index	0.011***	0.011***	0.011***	0.010***	0.000	-0.001**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LIBOR	-8.001	-8.165	-6.864	-5.323	0.039	-0.684
	(5.36)	(5.48)	(5.93)	(11.60)	(0.03)	(0.52)
Spread (HighYield – LIBOR)	-0.856	-0.814	-0.094	-0.298	0.030	-0.025
	(3.81)	(3.87)	(4.11)	(4.35)	(0.02)	(0.36)
Exchange Rate	-92.223	-83.302	-61.505	-26.560	-1.137	30.208
	(239.17)	(244.79)	(265.08)	(349.61)	(1.36)	(22.98)
Inflation				0.531		
				(3.42)		
GDP Growth	211.307	213.611	-504.127	-473.347	-7.828	-3.092
	(1,235.92)	(1,257.10)	(1,343.26)	(1,368.44)	(6.88)	(116.64)
N# of follow-ons	-0.770	-0.735	-2.351	-2.285	-0.002	0.194
	(3.69)	(3.76)	(4.11)	(4.17)	(0.02)	(0.36)
Observations	91	91	91	91	90	90
R-squared	0.386	0.387	0.441	0.441	0.486	0.697
Controls	NO	YES	YES	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES	YES

Table A8: Probit regression of the company conditions. Column 1 and 4 present the Probit results, columns 2 and 5 present the marginal effects at the means and columns 3 and 6 show the average marginal effects. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Probit	(2) Marginal Effects (μ)	(3) Marginal Effects	(4) Probit	(5) Marginal Effects (μ)	(6) Marginal Effects
Operating Revenue (ln) (strategy)	0.075	0.025***	0.075	0.071	0.024**	0.071
	(0.07)	(0.01)	(0.07)	(0.07)	(0.01)	(0.07)
Relative Capacity Utilization	0.015	0.005**	0.015	0.015	0.005**	0.015
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Relative Size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	-0.077	-0.025	-0.077	-0.081	-0.027	-0.081
	(0.36)	(0.05)	(0.36)	(0.36)	(0.05)	(0.36)
Return on Sales (follow-on)	-0.016	-0.005	-0.016	-0.013	-0.004	-0.013
	(0.05)	(0.01)	(0.05)	(0.05)	(0.01)	(0.05)
Return on Assets (follow-on)	0.202	0.067***	0.202	0.206	0.068***	0.206
	(0.17)	(0.02)	(0.17)	(0.17)	(0.02)	(0.17)
N# of follow-ons	0.029	0.010	0.029	0.031	0.010	0.031
	(0.06)	(0.01)	(0.06)	(0.06)	(0.01)	(0.06)
Observations	171	171	171	171	171	171
Controls	NO	NO	NO	YES	YES	YES

Table A9: Probit regression of the industry conditions. Column 1 and 4 present the Probit results, columns 2 and 5 present the marginal effects at the means and columns 3 and 6 show the average marginal effects. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Probit	(2) Marginal Effects (μ)	(3) Marginal Effects	(4) Probit	(5) Marginal Effects (μ)	(6) Marginal Effects
Inv. Herfindahl Top (ln)	-0.060	-0.021	-0.021	-0.051	-0.018	-0.018
	(0.07)	(0.02)	(0.03)	(0.07)	(0.02)	(0.03)
Inv. Herfindahl Mid (ln)	0.021	0.007	0.008	0.016	0.006	0.006
	(0.07)	(0.02)	(0.03)	(0.07)	(0.02)	(0.03)
Inv. Herfindahl Bottom (ln)	0.085	0.030	0.030	0.087	0.031	0.031
	(0.07)	(0.02)	(0.02)	(0.07)	(0.02)	(0.02)
Market Volatility	-0.001	-0.000	-0.000	-0.001	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market Growth (%)	-0.031	-0.011	-0.011	-0.033	-0.012	-0.012
	(0.05)	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)
Market Size (ln)	-0.016	-0.006	-0.006	-0.017	-0.006	-0.006
	(0.05)	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)
N# of follow-ons				0.019	0.007	0.007
				(0.04)	(0.01)	(0.01)
Observations	366	366	366	279	279	279
Controls	NO	NO	NO	YES	YES	YES

Table A10: Probit regression of the financing conditions. Column 1 and 4 present the Probit results, columns 2 and 5 present the marginal effects at the means and columns 3 and 6 show the average marginal effects. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Probit	(2) Marginal Effects (μ)	(3) Marginal Effects	(4) Probit	(5) Marginal Effects (μ)	(6) Marginal Effects
FTSE 350 Index	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LIBOR	0.112***	0.040***	0.041***	0.110***	0.039***	0.041***
	(0.04)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)
Spread (HighYield – LIBOR)	0.015	0.005	0.005	0.008	0.003	0.003
	(0.03)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
Exchange Rate	0.449	0.160	0.166	0.663	0.235	0.244
	(2.06)	(0.67)	(0.76)	(2.10)	(0.68)	(0.77)
GDP Growth	14.436	5.153*	5.319	14.627	5.190*	5.382
	(9.32)	(3.01)	(3.43)	(9.38)	(3.01)	(3.45)
N# of follow-ons				0.045	0.016	0.017
				(0.05)	(0.01)	(0.02)
Observations	360	360	360	275	275	275
Controls	NO	NO	NO	YES	YES	YES

Table A11: Probit regression of all the conditions. Column 1 and 4 present the Probit results, columns 2 and 5 present the marginal effects at the means and columns 3 and 6 show the average marginal effects. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Probit	(2) Marginal Effects (μ)	(3) Marginal Effects	(4) Probit	(5) Marginal Effects (μ)	(6) Marginal Effects
Operating Revenue (ln) (strategy)	0.056	0.018*	0.018	0.049	0.015	0.015
	(0.08)	(0.01)	(0.03)	(0.08)	(0.01)	(0.03)
Relative Capacity Utilization	0.014	0.004***	0.004	0.014	0.004**	0.004
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Relative Size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	0.019	0.006	0.006	0.041	0.013	0.013
	(0.38)	(0.04)	(0.12)	(0.38)	(0.04)	(0.12)
Return on Sales (follow-on)	0.028	0.009	0.009	0.032	0.010	0.010
	(0.08)	(0.01)	(0.02)	(0.08)	(0.01)	(0.02)
Return on Assets (follow-on)	0.188	0.059***	0.059	0.189	0.059***	0.059
	(0.17)	(0.02)	(0.05)	(0.17)	(0.02)	(0.05)
Inv. Herfindahl Top (ln)	-0.049	-0.016	-0.015	-0.031	-0.010	-0.010
	(0.13)	(0.01)	(0.04)	(0.13)	(0.02)	(0.04)
Inv. Herfindahl Mid (ln)	0.067	0.021	0.021	0.054	0.017	0.017
	(0.13)	(0.02)	(0.04)	(0.14)	(0.02)	(0.04)
Inv. Herfindahl Bottom (ln)	0.001	0.000	0.000	0.001	0.000	0.000
	(0.13)	(0.02)	(0.04)	(0.13)	(0.02)	(0.04)
Market Volatility	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market Growth (%)	-0.275	-0.087*	-0.086	-0.271	-0.085*	-0.085
	(0.44)	(0.05)	(0.14)	(0.44)	(0.05)	(0.14)
Market Size (ln)	0.040	0.012	0.012	0.049	0.015	0.015
	(0.10)	(0.01)	(0.03)	(0.10)	(0.01)	(0.03)
FTSE 350 Index	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LIBOR	0.135*	0.043***	0.042*	0.148**	0.046***	0.046**
	(0.07)	(0.01)	(0.02)	(0.07)	(0.01)	(0.02)
Spread (HighYield – LIBOR)	0.064	0.020***	0.020	0.054	0.017***	0.017
	(0.05)	(0.01)	(0.02)	(0.06)	(0.01)	(0.02)
Exchange Rate	0.351	0.110	0.110	1.098	0.343	0.343
	(3.46)	(0.40)	(1.09)	(3.66)	(0.42)	(1.14)
GDP Growth	19.121	6.019***	5.997	17.850	5.580***	5.575
	(16.31)	(1.88)	(5.11)	(16.43)	(1.88)	(5.13)
N# of follow-ons				0.053	0.016**	0.016
				(0.07)	(0.01)	(0.02)
Observations	146	146	146	146	146	146
Controls	NO	NO	NO	YES	YES	YES

Table A12: Duration models of the exit on company conditions. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Cox	(2) Weibull	(3) Gompertz	(4) Cox	(5) Weibull	(6) Gompertz
Operating Revenue (ln) (strategy)	0.027	0.047	0.053	0.006	0.029	0.038
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Relative Capacity Utilization	0.012	0.007	0.007	0.014	0.008	0.008
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Relative Size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	0.017	0.125	0.143	-0.023	0.079	0.106
	(0.30)	(0.30)	(0.30)	(0.31)	(0.31)	(0.31)
Return on Sales (follow-on)	0.006	0.032	0.030	0.035	0.063	0.055
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Return on Assets (follow-on)	0.031**	0.025*	0.020	0.032**	0.025**	0.020
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
N# of follow-ons	-0.002	0.017	0.019	0.006	0.024	0.025
	(0.05)	(0.05)	(0.04)	(0.05)	(0.04)	(0.04)
Observations	171	171	171	171	171	171
Controls	NO	NO	NO	YES	YES	YES

Table A13: Duration models of the exit on industry conditions. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Cox	(2) Weibull	(4) Gompertz	(6) Cox	(7) Weibull	(9) Gompertz
Inv. Herfindahl Top (ln)	-0.006	0.021	0.021	0.011	0.037	0.035
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Inv. Herfindahl Mid (ln)	-0.022	-0.014	-0.009	-0.036	-0.024	-0.017
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Inv. Herfindahl Bottom (ln)	0.072	0.041	0.035	0.087	0.052	0.043
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Market Volatility	0.001	0.001	0.000	0.001	0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market Growth (%)	-0.089	-0.219	-0.224	-0.088	-0.209	-0.215
	(0.08)	(0.14)	(0.15)	(0.08)	(0.14)	(0.14)
Market Size (ln)	-0.003	0.011	0.009	-0.012	0.003	0.002
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Observations	366	366	366	366	366	366
Controls	NO	NO	NO	YES	YES	YES

Table A14: Duration models of the exit on financing conditions. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Cox	(2) Weibull	(3) Gompertz	(4) Cox	(5) Weibull	(6) Gompertz
FTSE 350 Index	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LIBOR	-0.098**	-0.162***	-0.145***	-0.100**	-0.164***	-0.147***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Spread (HighYield – LIBOR)	-0.004	0.011	0.017	-0.009	0.005	0.012
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Exchange Rate	0.833	-2.326	-3.092	1.068	-2.083	-2.867
	(1.93)	(1.89)	(1.94)	(1.96)	(1.93)	(1.98)
GDP Growth	8.902	8.458	8.955	10.249	9.684	10.019
	(8.99)	(8.89)	(8.85)	(9.07)	(8.98)	(8.94)
Observations	360	360	360	360	360	360
Controls	NO	NO	NO	YES	YES	YES

Table A15: Duration models of the exit on all conditions. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Cox	(2) Weibull	(4) Gompertz	(6) Cox	(7) Weibull	(9) Gompertz
Operating Revenue (ln) (strategy)	0.035	0.048	0.053	0.018	0.034	0.040
	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)
Relative Capacity Utilization	0.009	0.009	0.009	0.007	0.007	0.008
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Relative Size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	0.149	0.204	0.227	0.147	0.203	0.224
	(0.33)	(0.33)	(0.33)	(0.33)	(0.33)	(0.33)
Return on Sales (follow-on)	0.007	0.026	0.025	0.022	0.038	0.036
	(0.09)	(0.10)	(0.09)	(0.10)	(0.10)	(0.09)
Return on Assets (follow-on)	0.033**	0.027**	0.023	0.034**	0.028**	0.023*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Inv. Herfindahl Top (ln)	0.017	0.029	0.031	0.021	0.032	0.034
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Inv. Herfindahl Mid (ln)	-0.036	-0.046	-0.039	0.004	-0.007	-0.003
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Inv. Herfindahl Bottom (ln)	0.100	0.147	0.156	0.065	0.108	0.121
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Market Volatility	-0.057	-0.098	-0.110	-0.022	-0.060	-0.076
	(0.13)	(0.13)	(0.12)	(0.13)	(0.13)	(0.13)
Market Growth (%)	0.001	0.001	0.001	0.001	0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market Size (ln)	0.116	-0.130	-0.257	0.272	0.016	-0.137
	(0.42)	(0.41)	(0.41)	(0.43)	(0.42)	(0.42)
FTSE 350 Index	0.058	0.076	0.076	0.044	0.064	0.067
	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)
LIBOR	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Spread (HighYield – LIBOR)	-0.054	-0.085	-0.080	-0.057	-0.086	-0.081
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Exchange Rate	0.038	0.049	0.054	0.037	0.049	0.053
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.05)
GDP Growth	1.892	0.132	-0.719	1.759	-0.043	-0.913
	(2.95)	(3.01)	(3.03)	(2.92)	(2.99)	(3.02)
N# of follow-ons	8.773	7.937	9.106	11.298	9.956	10.631
	(15.16)	(15.07)	(15.01)	(15.12)	(15.03)	(14.96)
Observations	146	146	146	146	146	146
Controls	NO	NO	NO	YES	YES	YES

Table A16: Heckman models for company conditions. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Change in ROA	(4) Change in ROA	(7) Change in ROA
Operating Revenue (ln) (strategy)	-15.800***	-15.596***	-15.721***
	(5.24)	(5.24)	(5.51)
Relative Capacity Utilization	-5.956**	-6.266**	-6.122**
	(2.88)	(2.93)	(3.03)
Relative Size	0.003	0.003	0.003
	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	20.520	21.459	15.432
	(26.79)	(26.80)	(26.94)
Return on Sales (follow-on)	1.379	1.164	2.477
	(3.76)	(3.78)	(3.75)
Return on Assets (follow-on)	-46.627**	-47.387**	-49.151**
	(19.26)	(19.29)	(19.10)
N# of follow-ons	1.135	0.998	-0.892
	(3.31)	(3.32)	(3.42)
Observations	158	158	158
Controls	NO	YES	YES
Industry FE	NO	NO	YES

Table A17: Heckman models for industry conditions. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Change in ROA	(4) Change in ROA	(7) Change in ROA
Inv. Herfindahl Top (ln)	11.886**	12.186**	13.097**
	(5.40)	(5.46)	(5.71)
Inv. Herfindahl Mid (ln)	-6.167	-6.501	-8.840
	(5.52)	(5.59)	(5.64)
Inv. Herfindahl Bottom (ln)	4.830	5.184	3.648
	(5.66)	(5.75)	(6.66)
Market Volatility	-0.192*	-0.196*	-0.120
	(0.00)	(0.00)	(0.00)
Market Growth (%)	6.175	6.112	11.056
	(9.93)	(9.92)	(9.94)
Market Size (ln)	4.914	4.810	9.289**
	(4.01)	(4.02)	(4.46)
Observations	304	304	304
Controls	NO	YES	YES
Industry FE	NO	NO	YES

Table A18: Heckman models for financing conditions. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Change in ROA	(2) Change in ROA	(3) Change in ROA
FTSE 350 Index	0.004**	0.004*	0.004**
	(0.00)	(0.00)	(0.00)
LIBOR	-5.360*	-5.427*	-4.304
	(3.09)	(3.15)	(3.23)
Spread (HighYield – LIBOR)	2.874	3.008	3.095
	(2.25)	(2.37)	(2.40)
Exchange Rate	-299.999**	-305.943**	-271.758*
	(144.47)	(148.07)	(152.31)
GDP Growth	836.067	827.898	567.693
	(692.14)	(693.09)	(689.01)
Observations	304	304	304
Controls	NO	YES	YES
Industry FE	NO	NO	YES

Table A19: Heckman models for all conditions. Robust standard errors are in parentheses. *, **, and *** stand for a 10%, 5%, and 1% significance level, respectively.

	(1) Change in ROA	(4) Change in ROA	(7) Change in ROA
Operating Revenue (ln) (strategy)	-17.641***	-17.631***	-21.174***
	(6.42)	(6.42)	(6.84)
Relative Capacity Utilization	-8.316***	-8.266***	-7.888***
	(2.87)	(2.89)	(2.92)
Relative Size	0.003	0.003	0.002
	(0.00)	(0.00)	(0.00)
Return on Assets (platform)	0.324	0.345	-14.273
	(27.92)	(27.91)	(28.20)
Return on Sales (follow-on)	3.606	3.617	8.912
	(5.69)	(5.69)	(6.10)
Return on Assets (follow-on)	-35.141*	-34.761*	-35.559*
	(19.25)	(19.44)	(20.09)
Inv. Herfindahl Top (ln)	-0.734	-0.682	-2.231
	(3.28)	(3.30)	(3.42)
Inv. Herfindahl Mid (ln)	24.243***	24.519***	20.191**
	(8.32)	(8.57)	(9.31)
Inv. Herfindahl Bottom (ln)	-6.390	-6.528	-14.258
	(8.79)	(8.85)	(9.02)
Market Volatility	9.215	9.296	15.950
	(9.17)	(9.19)	(11.05)
Market Growth (%)	-0.068	-0.071	-0.048
	(0.16)	(0.16)	(0.16)
Market Size (ln)	41.561*	41.499*	50.844**
	(24.80)	(24.81)	(25.19)
FTSE 350 Index	3.881	3.803	6.800
	(6.41)	(6.43)	(7.33)
LIBOR	0.011***	0.011***	0.011***
	(0.00)	(0.00)	(0.00)
Spread (HighYield – LIBOR)	-7.485	-7.365	-4.810
	(4.98)	(5.06)	(5.22)
Exchange Rate	-0.946	-0.941	-0.568
	(3.40)	(3.40)	(3.42)
GDP Growth	-87.339	-87.308	-82.555
	(213.13)	(213.14)	(216.97)
N# of follow-ons	213.936	227.492	-451.272
	(1,099.25)	(1,103.90)	(1,110.82)
Observations	133	133	133
Controls	NO	YES	YES
Industry FE	NO	NO	YES

Table A20: Akaike Information Criterion (AIC). This table reports the Akaike Information Criteria (AIC) for the Cox proportional hazards model, the Weibull model and the Gompertz model for the different duration analyses including and excluding controls.

	(1) Cox	(2) Weibull	(3) Gompertz	(4) Cox	(5) Weibull	(6) Gompertz
Company Conditions	1,076.463	381.231	402.970	1,073.911	378.981	402.190
Industry Conditions	2,580.618	772.157	821.147	1,941.637	605.528	645.367
Financing Conditions	2,420.303	736.552	787.341	1,841.805	581.020	623.687
All Conditions	903.288	331.531	351.849	897.880	326.243	347.815
Controls	NO	NO	NO	YES	YES	YES