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Perception of management in private equity firms

A study of factors that influence management perception

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Abstract: Academic findings regarding private equity owned portfolio companies is lacking, mainly due to limited availability of data. This study investigates the potential biases related to the evaluation of management in private equity firms' portfolio companies. We use data on self-reported scores of management qualities, obtained from a Swedish private equity firm covering 29 portfolio companies. Using a quantitative method involving a multiple regression, we evaluate the influence of industry success on PE-partners' perception of management performance in their PCs. Our findings suggest, but do not conclude, that industry success may have an influence on management perception, when controlling for other factors influencing management quality and processes. We find suggestive evidence of an inverse relationship between industry success and management perception. We additionally find supportive evidence of firm size and company maturity having a positive impact on management perception.

Tutor: Milda Tylaite

Key words: private equity, management, evaluation bias

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1 Introduction

The subject of performance in private equity buyout (BO) and venture capital (VC) firms (or PE, collectively) and their portfolio companies (PCs) has been extensively studied¹. PE success has been attributed to several factors, including the active and restrictive ownership (Moon, 2006), the long-term value creation focus (Burdell, 2009) and the use of leverage in BO transactions (Axelson, Jenkinson, Strömberg, & Weisbach, 2013). Importantly, several studies have found see for example Bloom, Nicholas, Sadun, & Van Reenen, (2015) and Yeboah, Tomenendal, & Dörrenbächer, (2014) the role of PC management to be a key factor for PC success.

The source of interest is easily understandable; the global PE industry has grown exponentially over the last two decades. In 1995, the global PE market raised total commitments of \$ 38 billion (Kaplan, Steven N. & Sensoy, 2015), and in 2019, a total of \$ 894 billion was raised (Bain Global private equity report, 2020) – a 23 fold increase. The Swedish PE market is no exception, and is one of the most mature PE markets in the world (Kokko, 2013). In 2015, revenues in PE-owned companies accounted for approximately 8.4% of Sweden’s GDP. (Private Equity & Performance Study, 2015).

Despite the significant interest in PE and performance in PCs, there has been limited research conducted on PE firms’ own evaluation of management contribution to PC success. As Kaplan, Steven & Lerner, (2016) notes, “the basic story on portfolio company data is not a great one...the availability of data as well as the consistency of the academic findings using these data are still lacking”. In view of findings that PE firms have had considerable success in investing in promising sectors (Barber & Goold, 2007), we find it interesting to review to what extent PE firms, and, in particular, their general partners, are objective in their attributions of success to management, and to what extent such attributions may be affected by other factors, such as general industry success.

¹ See for example Gompers & Lerner (1997), Ljungqvist & Richardson (2003), Kaplan & Schoar (2005) and Moskowitz & Vissing-Jørgensen (2002) as early examples, and more recent work from e.g. Robinson & Sensoy (2013), and Harris, Jenkinson, & Kaplan (2014).

We have gained access to a Swedish PE firm (The PE Firm), who indeed confirm that management plays a key role in their value enhancement plans. The PE Firm has provided us with self-reported evaluations of management in 29 of their PCs, present and realised.

With the PE Firm data as a basis, we seek to investigate:

- To what extent are general partners of a PE firm objective in their perception of the performance of management in their PCs; and
- To what extent can perception of management be disconnected from other factors which could influence performance of PC management.

With this study we thereby aim to contribute to the field with an understanding of the management evaluation practices and potential biases affecting those practices. We further add to the field, as suggested by (Yeboah et al., 2014), in that we provide an additional insight into the link between performance and management practices, looking into potential factors affecting perception of management.

We limit the study to a cross-sectional review, taking the time period into account only by way of considering averages over an applicable time period. The study is also limited to the consideration of certain industry reference financials and certain firm specific attributes as potential influencers of management evaluation. We thus exclude, for example, the degree of incentivisation of a particular management group, as such data is not available to us. Lastly, this study is based on data from a single PE general partner, and as such does not attempt to make broad generalisations, but rather provide an indicative insight into this area of research.

This paper is structured as follows: In section 2, we describe the theoretical framework relevant to this study, and present a review of relevant literature. In section 3, we outline the details of our methodology and our model, and the variables chosen to evaluate our research question. In section 4, we present our findings, and section 5 includes a discussion on the results. Section 6 contains robustness tests, and section 7 consists of suggestions for future research. Finally, section 8 includes our concluding remarks.

Definitions and acronyms

PE	Private Equity
VC	Venture Capital
BO	Buyout (the segment of PE on which this study focuses)
GP	General Partner of a PE Firm
PC	Portfolio Company
The PE Firm	The anonymous PE Firm from which data has been collected for this study

2 Theoretical framework and literature review

2.1 What is private equity

A PE firm is a financial vehicle in which investors provide capital to a common pool, or a “fund”, in order to, indirectly, make investments in companies. A company which is owned by a PE firm is typically referred to as a portfolio company (PC) of that fund.

The PE industry can broadly be divided into two main segments, venture capital (VC) and buyout (BO). A VC type PE firm typically acquires minority stakes in early development companies without the use of leverage to finance an acquisition (Neerza & Tripathi, 2014). A buyout firm (BO) generally acquires 100% of a target company and uses leverage to a significant extent (Axelson et al., 2013; Kaplan & Sensoy, 2014). The focus of this review is the BO segment of the PE industry.

PE firms make investments in portfolio companies with the intention of eventually making an “exit” (i.e. divesting the portfolio company), and realising a return equivalent to the difference between paid-in capital and proceeds received in an exit (Neerza et al. 2014). A sweet spot for PE funds is acquisitions that have been undervalued or undermanaged, where there is an opportunity to increase business value. Once that gain has been achieved, PE funds sell with the intention to maximise return (Barber, 2008).

PE funds are, as (Kaplan & Sensoy, 2014) sets out, usually organised as limited partnerships, where investors (limited partners) commit capital at the inception of a fund. The limited partnership is managed by a general partner, which is typically referred to as the PE firm. A PE fund typically has a contracted life of 10 years, after which the committed capital is to be employed, and the investments realised. In general, an investment (portfolio company) is held for three to eight years before exit (NVCA Yearbook, 2020). The general partner, as compensation for managing the partnership, typically receives a management fee (such as 2% p.a. of the committed capital) and a share of excess returns in relation to some set benchmark rate (so called “carried interest”) (Kaplan & Sensoy, 2014).

The general partner of a PE fund, and its associates, also monitor and represent the owners in the portfolio company board of directors, and associates are held accountable for the ultimate success or failure of an investment (Klein, Chapman, & Mondelli, 2013).

2.2 The role of management

Klein et al. (2013) set out that private equity is a governance structure rather than a method of financing. Klein et al. (2013) found that the emphasis of private equity lies within its powerful performance incentives as well as the strong connection between management and ownership.

Klein et al. (2013) summarises some of the most frequently cited benefits (and costs) of PE backed ownership. They note that, for small and mid-size companies, a PE firm “introduces modern professional management practices, better internal control and reporting methods, and formal strategic development and planning processes”. The authors outline some of the key aspects of PE ownership, and set out that PE firms strongly influence management and strategies of companies in which they invest.

Management’s central role in a PE setting is confirmed in several studies. For example, Wright, Amess, Weir, & Girma, (2009) found that PE involvement in companies resulted in performance gains, and attributed this to PE firms’ tendency of building structures in which incentive alignment (reduction of agency problems) for top management is congruent with a strong performance. One of the reasons for the performance increase, Wright et al. (2009) found, is the monitoring role that the PE firm holds. Wright et al. (2009) do not, however, evaluate the extent to which portfolio firms’ success could be attributed to other factors. Neither do they describe how big a part of negative results is a direct result of poor decisions by the management team.

Guo, Hotchkiss, & Song, (2011), looking at data from 94 BO transactions, found similar results as Wright et al. (2009) and concluded that PE returns were higher in situations where the PE firm had replaced the CEO post acquisition.

Several authors, like for example Wright et al. (2009) and Klein et al. (2013), note that PE firms are effective in reducing the agency costs² in portfolio companies through incentivisation and aligning management and owner interests.

2.3 Factors influencing portfolio company management

Size

Several studies have shown that there is a strong positive correlation between better management practices and a larger firm size. One study that shows this relation is Bloom, Genakos, Sadun, & Van Reenen, (2012) in which data was collected on management practices for almost 6,000 firms across 17 countries.

Maturity

Bloom et al. (2015), in a survey study of management practices, found that management practices in PE firms outperform every other ownership type, except for dispersed shareholders (publicly listed firms) which have very similar practices. The biggest differences are found to be when comparing PE firms to family/founder owned firms, indicating that maturity plays a role in management practices.

Leverage

Firm leverage affects management's leeway, as generated cash flows are increasingly used for debt repayment rather than other projects in higher-leveraged firms. Stringham & Vogel (2018) state that leverage is used as an "invisible hand" to keep corporate managers from underperforming or disregarding shareholder interest which is also confirmed by Kaplan & Strömberg (2009). This topic has been extensively studied in the field of theoretical corporate finance and contract theory, see for example Grossman & Hart (1982) and Hart & Moore (1995), although empirical findings are usually limited in investigating particular predictions of the models rather than the theories themselves (Colombo & Stanca (2006) p. 33). There is, in other

² The field of agency theory is widely researched, and the classic paper by Jensen & Mecklin (1976) is often cited. For a thorough review of the field, refer e.g. to Payne & Petrenko (2019).

words, ample support for the prevalence of a relation between management performance and leverage.

Firm performance related measurement bias

Bloom, Nicholas & Van Reenen (2007), found that managers in firms with good results tend to respond positively when evaluating the management practices, even if said management practices were in fact faulty. The authors suggest that this occurs due to psychological effects and refer to the phenomenon as “firm-performance-related measurement bias”. There is no other mention of this phenomenon, that we could find, indicating that the conditions surrounding it, in PE to PC relations, are relatively unexplored.

Industry

In a study conducted using data from twelve European countries by, Lubbers, von Eije & Westerman (2015), it is found that industries get influenced positively by higher values of PE investments. As stated in the article “[t]he results show that higher levels of PE investments positively influence the growth rates of production, value added, gross and net operating income, as well as the number of employees and wage levels of the industries.” This is further confirmed in the later Bernstein, Lerner, Sorensen, & Strömberg (2017), which concludes that industries in which PE acquisitions have been present in the last five years, have a faster growth of factors such as productivity and employment, compared to industries without such a presence. There is however, to our knowledge, no mention of such effects as the “firm-performance-related-measurement-bias” translated to industries.

2.4 Hypothesis

We consider the findings of Bloom, et al. (2007) and Yeboah et al. (2014) in the context of our research question. Given their findings on bias in evaluation of management practices, and Bernstein et al. (2017)’s findings on the success of industries with high PE involvement, we extend this thought and consider general industry success as a potential source of such bias. In particular, we hypothesise that *industry success has a positive impact on the perception of management*.

Hypothesis: *industry success has a positive impact on the perception of management*.

3 Methodology

With the theoretical framework as a basis for our analysis, we have conducted this study using a so-called combined method. By this, we mean that we have combined data from a survey, financial data from a database as well as certain data points provided to us. All survey data and data points of the studied firms in the dataset have been provided to us by the Swedish PE Firm (The PE Firm) to which we have had access. The study itself is based on a regression analysis of the data.

As a means to test our hypothesis, we consider the following basic model:

$$\text{Perceived Management} = \beta_0 + \beta_1 \text{Industry Factors} + \beta_2 \text{Control Variables} + \varepsilon$$

Where perceived management refers to the outcome of the survey conducted with The PE Firm, Industry Factors include variables allowing us to review the influence of industry performance on perception of management, and Control Variables include firm-specific factors that may influence the Perceived Management.

3.1 The survey

In order to evaluate management performance, we designed a survey based on the methodology of Bloom et al. (2007). Bloom et al. (2007) created a survey tool which was shown to proxy well for performance, in that results correlated with firm performance. As such, their method serves as an effective tool to measure management performance.

By relying on the methodology of Bloom et al. (2007), our intention is to decrease the bias in the answers and achieve a fair self-reported assessment of management from The PE Firm.

Considering the scope of our investigation, we limited the number of questions in the survey to 12, relying however on the core areas of the questions posed by Bloom et al. (2007). The questions were grouped into three general areas, namely Operations, Monitoring, Targets, Incentives and Development. Appendix 1 includes a complete copy of the survey which we executed for our study.

We chose to limit the amount of questions in order to ensure that the quality of the answers would not be affected by the amount of questions being too large, especially considering our limited access to The PE Firm. In addition, we deviate from Bloom et al. (2007) in that we do not ask control questions covering the same basic questions, relying instead on the fact that we have several questions per topic. We deem this to be sufficient for our study considering that we are ultimately looking for an average score of the overall management for each respective PC. This is expected to provide enough variance since the exact score for each individual question carries less importance.

The survey was directed towards partners of The PE Firm, where a score was provided on each question on a symmetric Likert scale. The scale ranged from “Strongly disagree” (1) to “Strongly agree” (7), with a neutral option in the middle. We used a seven point scale rather than a five point scale, which was done in order to increase variability of the answers, resulting in a higher probability of finding the best possible replication of reality (Joshi, Kale, Chandel, & Pal, 2015).

For each company surveyed, we used an average score as well as a Z-score. The Z-score was computed as the difference between the average score for each company and the average of the full dataset, in relation to the standard deviation of the mean score. (i.e. (Average score on questions for a company - average score of all responses) / standard deviation of the average scores). The Z-score was used to ensure variability in the answers, following the methodology of Bloom et al. (2007).

3.2 Financial measures of performance

Firm and industry performance are central factors in our study, and we therefore carefully considered how to measure it.

A commonly used measure of performance in portfolio companies in PE is the internal rate of return (IRR), and is typically measured during the ownership period (Gompers, Kaplan, & Mukharlyamov, 2016). As IRR would only be possible to assess following the realisation of an investment, it would, for the purpose of this study, be prohibitive to use as a measure of performance, as our reference industry data consists of financial data based on annual financial statements.

Instead, we consider more widely available data, and look at average growth and margin. In interviews with The PE Firm, it was confirmed that growth and margin (especially EBITDA and EBIT margin) was widely used as measures of performance. Khan & Hassairi, (2013) found in their study that EBITDA margin was one factor that PE firms are skilled at identifying as a performance measure to improve when taking firms from public to private. The PE Firm cited reasons for considering EBITDA and EBIT margins that included that the measures proxy for cash flow generation.

3.3 Industry Factors

In order to capture to what extent management perception is influenced by industry factors, we consider two basic factors to proxy for industry success. Relying on the study by Bloom et al. (2007), we consider industry growth and industry margin as proxies for industry success. We note that Bloom et al. (2007) used return on capital employed (ROCE) as an indicator of performance. Due to limitations in our dataset, we instead consider EBIT margin as a proxy, arguing that it would be a core driver of ROCE.

We thus include the following variables as industry factors:

Industry growth (*ind_growth*): The geometric average growth of total industry sales over the relevant time period.

Industry margin (*ind_margin*): The median EBIT margin of the total industry over the relevant time period. We opt to rely on the median margin in each peer group to lessen the effect of any outliers or erratic data in the industry peer group data.

3.4 Control Variables

Bloom et al. (2015) point out that management practices vary with company size and maturity, and note that PE backed firms have outperforming management practises matched only by larger firms with dispersed ownership (publicly listed firms). Bloom et al. (2015) also found that a large difference in management practices can be observed when comparing more mature firms to family/founder owned firms.

The dataset includes firms that were acquired by The PE Firm at various stages of a firm's maturity. In particular, it includes several firms which were acquired from its respective founders. The firms also differ significantly in size, and as such have widely varying amounts of resources, which might affect the level of management quality the firm can afford.

Stringham & Vogel (2018) notes that firm leverage keeps managers from underperforming or disregarding shareholder interest. We therefore include firm leverage as a control variable, as it serves to capture different degrees of risk-taking between PCs which may affect partners' perception on management.

As Bloom et al. (2007) notes, firm performance is a known source of measurement bias. In order to isolate the effect of industry factors from firm-specific bias, we therefore include control variables capturing firm growth rate and firm margin.

We therefore include the following control variables:

Firm size (*firm_size*): The number of employees employed by each firm. We expect this to have a positive influence on management perception.

Founder entry (*founder_entry*): Dummy variable indicating whether a firm was acquired by The PE Firm directly from its founder. The variable indicates an acquisition from a founder with "1" and is otherwise "0". We expect this to have a negative influence on management perception.

Firm leverage (*firm_leverage*): The average net debt to EBITDA ratio of each firm. We expect this to have a positive influence on management perception, as higher leverage would tend to align management interests more with owners'.

Firm growth (*firm_growth*): The sales growth of each firm. We expect that this will capture a degree of firm performance related measurement bias, and that this will have a positive impact on management perception.

Firm margin (*firm_margin*): The average EBITDA margin of each firm. We expect that this will capture a degree of firm performance related measurement bias, and that this will have a positive impact on management perception.

3.5 The model

Based on the above, we consider the following detailed model:

$$\begin{aligned} perception_z_i = & \beta_0 + \beta_1 ind_growth_i + \beta_2 ind_margin_i \\ & + \beta_3 firm_size_i + \beta_4 founder_entry_i + \beta_5 firm_leverage_i \\ & + \beta_6 firm_growth_i + \beta_7 firm_margin_i + \varepsilon_i \end{aligned}$$

Where *perception_z* refers to as the Z-score of the survey for each firm *i*. For sake of robustness, we also consider the equivalent model with the mean score as the dependent variable (variable *perception_mean*).

Building on our hypothesis and our reasoning above, we hypothesise the following signs for each variable (Table 1).

Table 1. Overview of model variables and predicted signs.

Variable	Description	Predicted sign	
		Perception_z	Perception_mean
ind_growth	Average industry growth	+	+
ind_margin	Median industry margin	+	+
firm_size	No. of employees of each firm	+	+
founder_entry	Indicator of entry type	-	-
firm_leverage	Average net debt/EBITDA of firm	+	+
firm_growth	Average firm growth	+	+
firm_margin	Average firm margin	+	+

3.6 Sample selection

The PE Firm has made approximately 100 investments during the last thirty years. Over this period, the team of The PE Firm has changed, and we also consider the difficulty in answering questions related to relatively old investments. We therefore focused the data collection on investments made from 2007 and onwards. Very recent investments were also excluded, due to limited availability of reference industry data for 2018 and onwards. The survey, with additional

firm data (control variables), got 29 responses, from a total of 31 questionnaires that were distributed.

For industry data, we obtained financial data on Swedish firms from the Serrano database. The Serrano database is hosted by Swedish House of Finance, and is based on compiled data from the Swedish Companies Registration Office and Statistics Sweden. In order to compile industry reference groups, we created subsets of data for a reference industry for each firm in the dataset. The industry subsets were based on the registered SNI classifications³, so that each industry reference group shared the same SNI classification as a firm in The PE Firm dataset.

³ SNI is a standard for the Swedish division of industries. SNI 2007 is the standard that applies from 2008, for example, to refer companies' activities to one or more industries.

4 Empirical findings

The complete dataset consists of 29 observations, each observation being made up of our measurement of management perception and a data point on each industry factor and the control variables.

4.1 Overview of the data

Table 2 below summarises the results from the survey, in terms of average response (1 being the lowest rating, and 7 the highest).

Table 2. Summary results from the survey.

Area	Question	Topic covered	Average score	Std. Dev.
Operations	1	Change processes	5.62	1.54
	2	Follow-up	5.10	1.54
	3	Capital management	5.07	1.33
Average, operations			5.26	1.48
Monitoring	4	Measuring progress	5.28	1.33
	5	Efficiency of measurements	4.93	1.46
	6	Taking action	5.55	1.33
Average, monitoring			5.25	1.38
Targets	7	Communicating targets	5.52	1.06
	8	Ownership	4.86	1.43
	9	Results	5.76	1.41
Average, targets			5.38	1.35
Results and development	10	Talent retention	4.07	1.67
	11	Internal development	4.24	1.18
	12	Incentive programs	5.69	1.71
Average, results and development			4.67	1.69
Average, total			5.14	1.50

Note: Average refers to the mean with respect to the score, and the total with respect to standard deviation (i.e. the “average” standard deviation for an area refers to the standard deviation of all responses in that area)

The general perception was ranked, on average, highly, with each question getting an average scoring on the positive side of neutral. The lowest average score was observed on question 10 (relating to talent retention and internal recruitment). Interestingly, when asked if management was incentivised such that their interests were aligned with the owners’, respondents gave the highest average score in the dataset (question 12). Targets received the highest amount of score and incentives and development the lowest. Bloom et al. (2007) found significant variations in management practice across their sample, the same large variation is not seen in our dataset.

Looking at the complete dataset (summarised in Table 3), a few things can be noted. As some firms had more specific industry (SNI) classifications than others, the reference industry groups vary in size, from only 3, in one case, to 631 in another. The average number of observations in each industry group is 84 companies, and the median number of observations in a reference group was 35.

On average, The PE Firm’s portfolio companies had significantly higher growth and margins than their respective reference industry groups.

Table 3. Summary of the main dataset.

Firm	Time period	Management perception		Industry factors			Control variables				
		perception_z	perception_mean	Observations	ind_growth	ind_margin	firm_size	founder_entry	firm_leverage	firm_growth	firm_margin
1	2017-2018	0.35	5.67	13	1%	1%	200	1	1.38	20.0%	7.4%
2	2017-2018	-1.31	3.17	341	6%	6%	80	1	1.14	17.7%	23.1%
3	2016-2018	0.57	6.00	3	-2%	9%	633	0	5.28	11.6%	5.1%
4	2015-2018	0.52	5.92	15	9%	2%	331	0	0.92	3.4%	4.4%
5	2017-2018	-1.54	2.83	21	9%	4%	90	1	6.90	4.3%	1.5%
6	2011-2018	0.24	5.50	94	5%	3%	518	0	3.40	10.4%	11.0%
7	2016-2018	0.35	5.67	94	12%	3%	95	0	3.20	18.2%	6.3%
8	2013-2018	-0.70	4.08	341	8%	5%	306	1	2.60	18.8%	9.9%
9	2017-2018	0.46	5.83	21	3%	5%	270	0	1.58	21.0%	11.4%
10	2013-2018	-0.37	4.58	6	54%	2%	110	1	2.20	-1.0%	10.5%
11	2016-2018	0.46	5.83	631	6%	3%	675	1	2.70	37.6%	6.1%
12	2017-2018	-1.15	3.42	133	10%	2%	60	1	-0.10	24.5%	7.3%
13	2011-2018	0.52	5.92	133	2%	1%	1800	1	9.40	5.5%	4.1%
14	2015-2018	0.29	5.58	8	1%	3%	480	0	3.30	31.1%	9.6%
15	2014-2018	-0.26	4.75	68	1%	12%	650	0	7.30	23.7%	6.7%
16	2015-2018	-0.76	4.00	22	6%	4%	112	0	0.30	-1.7%	15.6%
17	2016-2018	-0.32	4.67	59	7%	3%	95	0	1.40	7.8%	21.9%
18	2016-2018	0.29	5.58	45	12%	8%	450	0	1.80	5.4%	8.1%
19	2017	0.02	5.17	31	16%	11%	110	1	0.20	53.3%	47.4%
20	2016-2017	0.85	6.42	7	-1%	4%	483	0	-0.90	2.9%	7.1%
21	2015-2017	0.57	6.00	11	5%	5%	490	0	3.30	4.9%	28.0%
22	2009-2016	0.18	5.42	36	6%	3%	516	0	10.00	-2.0%	7.3%
23	2012-2016	0.35	5.67	16	-11%	2%	2256	1	2.00	4.1%	10.2%
24	2012-2015	-0.43	4.50	6	8%	1%	550	1	5.80	-22.5%	12.8%
25	2007-2014	-0.32	4.67	77	-1%	3%	133	0	2.60	6.4%	17.3%
26	2012-2014	0.57	6.00	35	11%	1%	175	1	1.20	15.3%	9.9%
27	2011-2013	0.79	6.33	118	3%	3%	290	0	1.50	7.6%	17.1%
28	2007-2012	0.02	5.17	6	5%	4%	270	0	4.70	7.7%	9.4%
29	2008-2010	-0.26	4.75	50	-10%	8%	40	1	1.80	11.1%	11.7%
Average		0.00	5.14	84	6%	4%	423	N/A	3.00	12.0%	12.0%
Median		0.24	5.50	35	6%	3%	290	0	2.20	7.8%	9.9%

4.2 Model findings

The results from our main regressions are summarised in table 4 below.

Table 4. Main regression results.

Variable	Huber-White robust standard errors		Non-heteroskedasticity robust standard errors	
	perception_z	perception_mean	perception_z	perception_mean
Industry factors	<i>ind_growth</i>	0.565 (0.377)	0.848 (0.377)	0.565 (0.583)
	<i>ind_margin</i>	-6.969+ (0.078)	-10.46+ (0.078)	-6.969 (0.139)
	<i>firm_size</i>	0.0007384** (0.008)	0.0011085** (0.008)	0.0007384** (0.006)
	<i>founder_entry</i>	-0.773** (0.003)	-1.161** (0.003)	-0.773** (0.002)
Control variables	<i>firm_leverage</i>	-0.0329 (0.397)	-0.0494 (0.397)	-0.0329 (0.461)
	<i>firm_growth</i>	1.491+ (0.071)	2.239+ (0.071)	1.491 (0.104)
	<i>firm_margin</i>	0.283 (0.813)	0.424 (0.813)	0.283 (0.833)
	<i>constant</i>	0.160 (0.575)	5.382*** (0.000)	0.160 (0.575)
Observations				
R-squared				
Adjusted R-squared				
p-values in parentheses				
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001				

Of our two industry factors, we note that industry growth does not seem to have significant influence on management perception. Industry margin, however, seems to have some degree of explanatory power, when running the regression with heteroskedasticity robust standard errors.

Of the control variables, firm size seems to have a clear influence on management perception, which is in line with our prediction. In addition, our variable controlling for situations where the PE Firm had acquired a company from its founder, seems to have explanatory power.

Contrary to our expectations, firm leverage and firm margin seem to have no explanatory power in relation to management perception. Firm growth, on the other hand, seems to have some degree of explanatory power, when running the regression with heteroskedasticity robust standard errors.

Table 5 below summarises the results compared to our predicted signs.

Table 5. Summary of findings and comparison to predictions.

Variable	Predicted sign		Result	
	Perception_z	Perception_mean	Perception_z	Perception_mean
ind_growth	+	+	Insig.	Insig.
ind_margin	+	+	-	-
firm_size	+	+	+	+
founder_entry	-	-	-	-
firm_leverage	+	+	Insig.	Insig.
firm_growth	+	+	+	+
firm_margin	+	+	Insig.	Insig.

5 Discussion

We initially note that, interestingly, while there seems to be some degree of influence on management perception from industry margin, the relationship has the opposite direction compared to our expectations. The regression results indicate that *higher* industry margins are associated with *lower* perceptions of management. It is difficult to draw far-reaching conclusions on this result alone, but it seems to suggest that in better-performing industries, management is evaluated more harshly, and vice versa.

Looking at our industry factors overall, the results indicate that our survey, and The PE Firm's responses, effectively measure management quality, and seem to be affected by industry factors to a small extent. Our findings on the relationship between industry growth and management perception does not seem to support our hypothesis, as we were unable to identify a significant relationship. By way of indication, the coefficient estimate is positive, but cannot be shown to be significantly different from zero on meaningful confidence levels.

Given the unexpected direction of the relationship between industry margin and management perception, we evaluated to what extent this could have been influenced by data outliers. We analysed various pairs of the data points, and found one outlier when plotting *perception_mean* vs *ind_growth* (firm 10). Running the regressions excluding this data point (i.e. with 28 observations), however, did not yield materially different results.

Our results support our predictions of the influence of size and maturity on management perception. Firm size is positively correlated with a higher management perception, and The PE Firm has a lower perception of management in situations where a firm has been acquired from its founder. The latter supports the findings of Bloom et al. (2015), in that we observe a discrepancy between more mature firms and firms which have recently transitioned from family/founder to PE.

Firm leverage does not seem to have significant explanatory power on management perception, contrary to our expectations. Considering the theoretical support for the idea that increased leverage serves to align management's interests with the owners' (Stringham & Vogel, 2018), we find this rather surprising. This is especially true considering the results from the survey, in

which high scores were in general given in the questions relating to the alignment of interests between management and owners.

With respect to the firm leverage variable, the following should, however, be considered. Our dataset consists exclusively of firms that have been subject to a leveraged buyout. This would limit the variability of this control variable, limiting the explanatory power. We therefore look into the difference between the average firm leverage and the average leverage of the industry reference group. Table 6 below summarises the average of the firm leverage and the equivalent measure of the industry group (*ind_leverage*). It can be noted that, while the average firm leverage is approximately 3.00 (net debt in relation to EBITDA), the average in the industry groups is -0.06. I.e., the average company in the industry reference group has a net cash position⁴. It thus seems clear that the firms in the dataset have, on average, quite high leverage.

Table 6. Comparison of leverage between portfolio companies and industry average.

Variable	Obs	Mean	Std. Dev.	Min	Max
ind_leverage	29	-0.058	2.024	-4.668	3.482
firm_leverage	29	2.996	2.708	-0.900	10.000

Firm margin does not seem to have significant explanatory value in our model, while firm growth had some degree of explanatory power (with heteroskedasticity robust standard errors). It could be argued that firm growth proxies well for firm success, which would imply that this variable successfully controls for firm performance related bias as discussed by Bloom et al. (2007). Other potential explanations could, however, apply with respect to firm growth's role in management perception.

The PE Firm employs a strategy of acquisitive growth in many of its portfolio companies, which is a common strategy among PE firms (Borell & Heger, 2013). The financial data used for the portfolio companies comes from consolidated financial statements, whereas the industry

⁴ For the sake of computing the average industry leverage, samples with negative EBITDA were excluded. A negative net debt to EBITDA ratio thus indicates a net cash position.

reference group data is based on Serrano, which does not include consolidated financial statements. This means that while acquisitive growth would be included in the firm data, it would not generally be reflected in the industry group. As acquisitions completed within the same industry would not affect the industry total, we still deem the industry reference point to be reflective of industry growth. However, this means that high firm growth could be associated with a successful integration of an acquisitive growth strategy. It is therefore difficult to separate whether the positive relation between firm growth and management perception tends to proxy for successful strategy implementation or to what extent it captures a degree of performance related measurement bias.

Our results, in terms of firm success factors, may indicate that while firm performance related measurement bias is present among managers' self-evaluation (Bloom et al. 2007), it does not seem to extend to owners' perception of management.

A few points are, however, worth noting regarding the limitations of the study and the conclusions that can be drawn from our results. Firstly, while we have chosen proxies for industry success which seem to have some explanatory power in our model, it cannot be excluded that other proxies may have proven more effective. For example, measures of return rates, such as in the case of Bloom et al. (2007), ROCE, cash flow or other measures that would account for aspects such as asset intensiveness or riskiness in a particular industry.

Secondly, the size and relevancy of the industry peer groups vary for each firm. This may be due to the methodology we use to establish reference peer groups. As certain portfolio companies in the data set have quite specific industry classifications, their respective peer groups tend to be comparatively smaller. Others, with more general industry classifications, get comparatively larger peer groups. By way of compensation, this, however, also implies that while the more specifically classified peer groups tend to be smaller, they also tend to serve as more precise peer groups. Conversely, the less specifically classified groups serve as less precise peer groups, but are in general composed of a larger set of observations.

With respect to our dataset in general, it consists of 29 observations. The relatively small dataset means our test would yield higher p-values, in general, compared with running the model with a larger dataset. While the probability of a type 1 error would be constant (by definition), a larger

dataset would have allowed us to detect smaller differences from zero-coefficients with higher certainty. Looking at the regression results, it may be noted that coefficients that were identified as non-significantly different from zero also had quite high p-values. This could suggest that our findings would not have changed materially, even using a larger dataset.

Our data comes from a single PE firm. It cannot be excluded that including data from other PE firms could have introduced more variance in the data, which could have yielded different or stronger results. Our research method also differs from that of Bloom et al. (2007) in that while their data was collected in “blind” interviews, ours consists of self-reported scores. This could have introduced a degree of bias in the responses, and might explain the relatively high average scores observed in our survey.

Lastly, while we attempt to control for known biases and influencers of management perception, it cannot be excluded that there could be other sources of bias or relevant variables that were omitted from the model (for example, we notably have not included a control for management incentivisation, as commented on in the introduction). This might have caused a bias in our estimates.

6 Robustness tests

We realise that the inclusion of industry and firm success factors may introduce a problem of multicollinearity, i.e. a correlation between the independent variables of a regression. While the existence of multicollinearity would not affect the effectiveness of the model as a whole, it could cause erratic values (high p-values) for each independent variable coefficient. Multicollinearity thus results in complications when interpreting outcomes from the test, since the explained variance would be increasingly randomly distributed between inter-correlated variables (Farrar & Glauber, 1967).

We examine this potential issue in two ways. First, we conduct a VIF test, and the results are summarised in Table 7 below.

Table 7. Findings from VIF test.

Variable	VIF	1/VIF
ind_growth	1.38	0.7272
ind_margin	1.63	0.61383
firm_size	1.58	0.63461
founder_entry	1.26	0.79172
firm_leverage	1.49	0.67183
firm_growth	1.56	0.64144
firm_margin	1.50	0.66866
Mean VIF	1.48	

We examine the results of the VIF test looking at VIF and “Tolerance” (1/VIF) for each of our independent variables. A VIF value of 1 indicates that there is no multicollinearity. While there is no formal rule regarding an accepted VIF value, Yoo et al. (2014) argue that values greater than 10 are considered to indicate that the independent variables are subjected to problematic multicollinearity. Others, such as O’Brian. (2007) suggests that multicollinearity should be considered more than moderate at levels from 4 and above. As presented in Table 7, all our

variables show a VIF value below any cut-off point argued by aforementioned. This implies that our model is subject only to moderate multicollinearity issues, and the coefficients should not be significantly affected.

Looking further into the robustness of the model, we run the regression separately with only the industry factors and the control variables, respectively. The results are summarised in Table 8 below.

Table 8. Results from regressions run on subsets of variables.

Variable		perception_z	perception_z	perception_z
Industry factors	<i>ind_growth</i>	-1.194*		
		(0.028)		
	<i>ind_margin</i>	-1.699		
		(0.553)		
Control variables	<i>firm_size</i>		0.000677*	0.000686**
			(0.012)	(0.009)
	<i>founder_entry</i>		-0.624**	-0.624**
			(0.008)	(0.006)
	<i>firm_leverage</i>		-0.0498	-0.0462
			(0.264)	(0.286)
	<i>firm_growth</i>		0.820	0.749
			(0.223)	(0.193)
	<i>firm_margin</i>		-0.436	
			(0.703)	
	<i>constant</i>	0.141	0.0965	0.0384
		(0.387)	(0.691)	(0.855)
Observations		29	29	29
R-squared		0.048	0.411	0.407
Adjusted R-squared		-0.025	0.282	0.309
p-values in parentheses				
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001				

The results show that, when considering a model which only includes the industry factors, industry growth appears to influence perception of management rather than industry margin. Leaving out control variables, however, may have caused that setup to provide biased estimates due to omitted variable bias. If, for example, there is a negative correlation between industry growth and firm growth (such as, if the firm gains market share at the expense of the industry reference group, or vice versa), and *firm_growth* (omitted variable) has positive correlation with *perception_z* (such as, higher firm growth leads to improved management perception, as discussed above) this would bias the coefficient of *ind_growth* downwards if the *firm_growth* variable is omitted. Table 9 below summarises the correlation between the variables in our model, and does suggest there would be a negative bias in the *ind_growth* variable in the reduced-form version that excludes the control variables.

Table 9. Overview of correlation coefficients.

Correlation (no. obs: 29)	<i>perception_z</i>	<i>ind_growth</i>	<i>ind_margin</i>	<i>firm_size</i>	<i>founder_entry</i>	<i>firm_leverage</i>	<i>firm_growth</i>	<i>firm_margin</i>
<i>perception_z</i>	1.0000							
<i>ind_growth</i>	-0.2064	1.0000						
<i>ind_margin</i>	-0.0690	-0.0347	1.0000					
<i>firm_size</i>	0.3670	-0.3488	-0.0766	1.0000				
<i>founder_entry</i>	-0.3923	0.1810	-0.2228	0.1368	1.0000			
<i>firm_leverage</i>	-0.0229	-0.0757	0.0325	0.3717	-0.0453	1.0000		
<i>firm_growth</i>	0.0546	-0.0513	0.4238	-0.1562	0.1666	-0.2748	1.0000	
<i>firm_margin</i>	-0.0705	0.1020	0.3897	-0.2330	0.0455	-0.3577	0.3376	1.0000

In the setup where we include only the control variables, the results suggest that firm growth no longer has explanatory power, and firm size and entry type are the main relevant control variables. As discussed above, firm growth might proxy for a successfully integrated growth strategy. Using, then, the same reasoning as above, if an omitted variable (*ind_margin*) is positively correlated with *firm_growth* (for example, if motivation is stronger to pursue and acquisitive strategy in high-margin industries), and *ind_margin* is negatively correlated with management perception, the *firm_growth* coefficient will be negatively biased by the omission of *ind_margin*.

With these tests reviewed, we consider the model to be consistent when evaluating robustness.

7 Suggestions for future research

We have identified a number of interesting further studies which could be conducted to improve the understanding of our findings. Given that we identified a negative relationship between management perception and industry success, future studies could evaluate, specifically, if there is a tendency for owners to have higher perceptions of management in poor performing industries, and vice versa, when controlling for known influencers on management performance.

Furthermore, it would be interesting to conduct a study similar to ours basing it on a bigger dataset. As we have noted in this study, our data stemmed from a single PE firm. With the addition of a larger data set, including several PE firms, the influence of any potential factors tied to a specific PE firm could be reduced, and a higher variability in the data could be obtained. Thereby, future authors might increase their chances of a higher variance in their findings potentially leading to stronger results.

Lastly, in this study, we have relied on the simple measures of growth and margin to proxy for industry success. We note that other studies, notably Bloom et al (2007), opted to instead include a measure of return (ROCE). Our suggestion for future studies would therefore be to consider return measures, such as ROCE, as additional variables, as that would allow for a more holistic proxy for industry attractiveness and control for industry and firm differences such as differing levels of capital intensiveness.

8 Concluding remarks

In this study, we have reviewed to what extent partners of a PE firm are objective in their assessment of management performance, and whether their assessment can be disconnected from other factors which could influence performance and hence the perception of management. We hypothesised that industry success would have a positive impact on the perception of management, and, in other words, be a source of bias in management perception.

Our results indicate that industry success, contrary to our hypothesis, tends to have a negative influence on management perception. We have found no immediate theoretical support for this relationship. Our results seem to support the idea that partners of a PE firm can be influenced by industry factors in their perception of management, but not in the way that we expected.

With respect to the second part of our research question, we found that firm size and a proxy for company maturity tend to influence (perception of) management quality, which supports the findings of Bloom et al. (2015). Further, we expected to see a positive relationship between perception of management and firm leverage, in line with what is set out by Stringham & Vogel (2018), but found no significant relationship. Our analysis suggests that variation in our data is limited, as the firms in our dataset are, in general, all highly leveraged compared with industry peers.

We set out to see if the idea of firm performance related measurement bias might extend to owners' perception of management. This study contributes to the field by the indication that there might be a negative relationship between industry success and perception of management. Furthermore, this study has contributed by widening the understanding of management evaluation practices as well as potential biases influencing those practices.

References

- Axelson, U., Jenkinson, T., Strömberg, P., & Weisbach, M. S. (2013). *Borrow cheap, buy high? the determinants of leverage and pricing in buyouts*. *Journal of Finance*, 68(6), 2223-2267.
- Bain & Company. (2020) *Bain Global private equity report*.
- Barber, F. (2008). *The strategic secret of private equity*. *Strategic Direction*, 24(2)
- Barber, F., & Goold, M. (2007). *The strategic secret of private equity*. *Harvard Business Review*, 85(9), 53-61.
- Bernstein, S., Lerner, J., Sorensen, M., & Strömberg, P. (2017). *Private equity and industry performance*. *Management Science* 1198-1213
- Bloom, N., Genakos, C., Sadun, R., & Van Reenen, J. (2012). *Management practices across firms and countries*. *Academy of Management Perspectives* 12-33
- Bloom, N., Sadun, R., & Van Reenen, J. (2015). Do private equity owned firms have better management practices? *The American Economic Review*, 105(5), 442-446.
- Bloom, N., & Van Reenen, J. (2007). Measuring and explaining management practices across firms and countries. *The Quarterly Journal of Economics*, 122(4), 1351-1408.
- Borell, M. Heger, D. (2013). *Sources of Value Creation Through Private Equity-Backed Mergers and Acquisitions: The Case of Buy-and-Build Strategies*. Centre for European Economic Research Discussion Paper No. 13-094
- Burdell, S. (2009). *Private equity secondaries: Opening the liquidity tap*. *Thunderbird International Business Review*, 51(6), 533-537.
- Colombo, E. L, Stanca. (2006) *Financial Market Imperfections and Corporate Decisions: Lessons from the Transition Process in Hungary (Contributions to Economics)* p.33
- Farrar, D.E. & Glauber, R.R. 1967, *Multicollinearity in Regression Analysis: The Problem Revisited*, *The Review of Economics and Statistics*, 49(1), 92-107.

- Gompers, P., Kaplan, S. N., & Mukharlyamov, V. (2016). *What do private equity firms say they do?* Journal of Financial Economics, 121(3), 449-476.
- Gompers, P., and J. Lerner. (1997) *Risk and Reward in Private Equity Investments: The Challenge of Performance Assessment*. The Journal of Private Equity, 5-12
- Grossman, S. Hart, O. (1982) *Corporate Financial Structure and Managerial Incentives*. The Economics of Information and Uncertainty, 107-140
- Guo, S., Hotchkiss, E. S., & Song, W. (2011). *Do buyouts (still) create value?* Journal of Finance, 66(2), 479-517.
- Harris, R.S., T. Jenkinson, and S.N. Kaplan. (2014). *Private Equity Performance: What Do We Know?* Fama-Miller working paper.
- Hart, O., & Moore, J. (1995). *Debt and seniority: An analysis of the role of hard claims in constraining management* American Economic Association.
- Jensen, M. C., & Meckling, W. H. (1976). *Theory of the firm: Managerial behavior, agency costs and ownership structure*. Journal of Financial Economics, 3(4), 305–360.
- Joshi, A., Kale, S., Chandel, S., & Pal, D. (2015). *Likert scale: Explored and explained*. British Journal of Applied Science & Technology, 7(4), 396-403.
- Kaplan, S.N., and A. Schoar. (2005) *Private Equity Performance: Returns, Persistence, and Capital Flows*. Journal of Finance, 60(4), 1791-1824.
- Kaplan, S. Sensoy, B. A. (2014). *Private equity performance: A survey*. Annual Review of Financial Economics. 7(1), 597-614.
- Kaplan, S., & Lerner, J. (2016). *Venture capital data: Opportunities and challenges*. NBER Working Paper Series.
- Kaplan, S. N., & Strömberg, P. (2009). *Leveraged buyouts and private equity*. Nashville: American Economic Association.

- Khan, H., & Hassairi, S. (2013). *Do the going private transactions help increasing the ex post value for firms: An evidence from european market*. International Journal of Economic Perspectives, 7(1), 24-50.
- Klein, P. G., Chapman, J. L., & Mondelli, M. P. (2013). *Private equity and entrepreneurial governance: Time for a balanced view*. Academy of Management Perspectives, 27(1), 39-51.
- Kokko, C. (2013). *Private equity and the swedish M&A market*. American Lawyer, 35, 78.
- Ljungqvist, A., and M. Richardson. (2003). *The Cash Flow, Return, and Risk Characteristics of Private Equity*. NBE
- Lubbers, R. von Eije, H & Westerman, W (2015) *Does Private Equity Stir Up European Industries?* SSRN
- Moon, J. J. (2006). *Public vs. private equity**. Journal of Applied Corporate Finance, 18(3), 76-82.
- Moskowitz, T.J., and A. Vissing-Jørgensen. (2002). *The Returns to Entrepreneurial Investment: A Private Equity Premium Puzzle*. American Economic Review, 92(4), 745-778.
- Neerza, D. V., Tripahti. (2014). *Private Equity Investments: A Literature Review*. International Research Journal of Management Science & Technology, 5(1), 208-245.
- National venture capital association (NVCA) Yearbook, 2020
- O'Brian, R. (2007) *A Caution Regarding Rules of Thumb for Variance Inflation Factors*. SpringerLink
- Payne, G. Petrenko, V. (2019) *Agency Theory in Business and Management Research*. Online publication, Oxford research encyclopaedias.
- Private Equity, & Performance Study. (2015). SVCA

Robinson, D.T., and B.A. Sensoy. (2013) *Do Private Equity Fund Managers Earn their Fees? Compensation, Ownership, and Cash Flow Performance*. Review of Financial Studies, 26(11) 2760-2797.

Stringham, E., & Vogel, J. (2018). *The leveraged invisible hand: How private equity enhances the market for corporate control and capitalism itself*. European Journal of Law and Economics, 46(2), 223-244.

Wright, M., Amess, K., Weir, C., & Girma, S. (2009). *Private equity and corporate governance: Retrospect and prospect* Corporate Governance: An International Review, 17(3) 353-375

Yeboah, H. J. N., Tomenendal, M., & Dörrenbächer, C. (2014). *The effect of private equity ownership on management practices: A research agenda*. Competition & Change, 18(2), 164-179.

Yoo, W. Mayberry, R. Bae, S. Singh, K. (2014) *A Study of Effects of MultiCollinearity in the Multivariable Analysis*. International Journal of Applied Science and Technology, 4(5).

Appendix 1: survey

Operations

1) **Change processes:**

To what extent does/did the management team of X incorporate proactive programs with initiatives to drive change and improvement in the company? (For example, initiatives to continuously improve efficiency, quality, productivity, etc.)

2) **Follow-up:**

To what extent does/did the management team of X document, measure and follow up on impact of programs with initiatives?

3) **Capital management:**

To what extent does/did the management team X manage its working capital and liquidity, including management of inventory levels, minimising slow-moving products and ensuring a strong liquidity?

Monitoring

4) **Measuring progress:**

To what extent does/did the management team of X use KPIs to monitor status and progress of key business or manufacturing activities?

5) **Efficiency of measurements:**

How would you rate key KPIs in their ability to capture critical success factors?

6) **Taking action:**

To what extent does/did X take appropriate actions in situations where parts of the business (or a manager) does/did not meet agreed upon results?

Targets

7) **Communicating targets:**

To what extent does/did the management team of X communicate the company's target to the rest of the organisation?

8) **Ownership:**

To what extent does/did the management team of X secure a strong ownership of targets and performance on all relevant levels of the organisation?

9) **Results:**

How well does/did the management team of X work/worked towards reaching the agreed upon goals?

Incentives and development

10) **Talent retention:**

To what extent does/did the company have a possibility to recruit internally when filling openings in the top management team?

11) **Internal development:**

To what extent does/did the company provide internal training and development to allow talent to rise within the organisation?

12) **Incentive programs:**

To what extent is/was the management team of X well incentivised such that their personal interests were aligned with the company's owners'?