The effect of Private Equity involvement: Deals across the border and in particular the healthcare sector

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Abstract

In light of massively increasing globalization and cross-border transaction, this paper investigates the effects of private equity involvement in cross-border deals. A sample of 3355 M&A deals, with a US acquirer, from a period of 2010 up until 2019 is used. This paper divides the effect of private equity involvement into two components: the impact of private equity involvement on the likelihood of a cross-border M&A deal and the effect of private equity involvement on the performance of cross-border M&A deals. Further, this paper investigates the effect of private equity involvement in the healthcare sector in specific. This paper concludes that private equity-backed acquirers have a lower chance of being involved in cross-border deals. For private-equity-backed targets, we find no significant effects on the likelihood of a cross-border deal. Furthermore, this paper finds that when controlling for low governance countries, private equity involvement on any side has a positive effect on the cross-border deal performance. However, this paper finds no effects of private equity involvement on the performance in the cross-border healthcare sector specifically.

Keywords: Mergers and acquisitions, cross-border, private equity, healthcare, cumulated abnormal stock returns, United States

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1. Introduction

Cross-border mergers and acquisitions have been massively increasing the past decades, partly because of increased liberating financial policies and global growth strategies (Warter & Warter 2014). This trend will continue as globalization increases as well as the number of companies that use M&A to complement organic growth. As a result of these developments, research on the cross-border transactions also increased over the years. Furthermore, the net effects of M&A transactions are a matter of ongoing debate among academic researchers. This research will contribute to the existing literature by looking deeper into the role of private equity firms in cross-border M&As and in particular at their performance in the healthcare industry.

With the increase in cross-border transactions, specific problems arise. For instance, legal and regulatory constraints and changes in these constraints create uncertainty and call for expertise to turn these challenges into opportunities (Morris & Lamers 2018). Furthermore, differences in language, accounting standards, corporate cultures and geographic distance add to the set of difficulties. Acquiring firms from foreign countries thus have a harder time identifying potential opportunities. Uncertainty about the quality of the target firms and information asymmetries arise, which could lead to a market for 'lemons' (Akerlof, 1978).

This is where PE firms could show their value. Not only do these PE firms have their well-trained analysts to do research but also do these firms typically have a broad international network that adds value to their performance (e.g., Hochberg, Ljungqvist, & Lu, 2007). This network could help reduce information asymmetries in M&A transactions. Furthermore, the network could help either PE-backed acquirer or PE-backed targets find the best match for a deal. From these observations, we formulate the following hypotheses:

1. *Private equity-backed acquirers are more likely to acquire foreign targets than non-private equity-backed acquirers.*
2. *Private equity-backed targets are more likely to receive a bid from foreign acquirers than non-private equity-backed targets.*

If the network of PE firms helps with reducing information asymmetries, the presence of the PE firm should relate with the likelihood of a cross-border M&A and the value creation of this transaction. Also, PE firms could have extra reputational incentives to successfully complete deals. Furthermore, the PE-backing should create value, especially when targets are located in weaker governance countries, as this is related to higher information asymmetries (Gul & Qiu

2002). This could be seen as governance synergies, as the PE-backed acquirer capitalizes on the imperfect information environment of the target firm. The next hypotheses follow:

3. *In cross-border deals, takeovers that involve private equity-backed targets and private equity-backed acquirers perform better than other acquisitions.*
4. *In cross-border deals, private equity-backing on the acquirer side especially creates value if the target is in an imperfect information environment.*

At last, we will focus on deals in the healthcare industry. In the 1980s and 1990s, private equity typically avoided investments in healthcare services because the industry appeared to be more complicated than other industries (e.g. Robbins, Rudsenske & Vaughan, 2008). Nowadays, however, private equity investors are very much involved in the healthcare industry. The global healthcare private equity deal value reached 78.9 billion dollars and outperformed the broader PE market in 2019 (Jain & Murphy, 2020). An essential factor for the resilience of the industry is the underlying demand for healthcare, combined with a global ageing and rising incomes in emerging markets.

The healthcare industry shows to be peculiar compared to others. The industry consists of multiple separate entities that serve the community. These entities are often not entirely vertically integrated, and the entities are both trading partners in itself and providers to customers. Also, almost every aspect of the industry is highly regulated. Government agencies regulate the creation, manufacturing, sale and use of drugs, diagnostic tests and medical devices (Gee, 2016). These factors make it difficult for new entrants to enter the market and trouble disruption.

One of the motivations for the healthcare industry to use M&A frequently is to complement and substitute early-stage research. High expenses on the research and development side incur to develop, for instance, new drugs or medical equipment. In order to compensate for these high risks, firms might expect high short term returns. Also, in pharmaceutical acquisitions, evidence suggests positive returns on both the short term and long term (Hassan et al., 2007). A possible reason for this could be that more prominent pharmaceutical companies acquire patents, divisions or smaller biotech companies for strategic reasons. Positive market reactions could follow because of the value added to the portfolio of the more prominent firms. Although the healthcare industry and the PE focused on this sector continues to grow, PE firms may run

into problems. Valuation multiples are high since PE firms often compete against strategic investors that can pay for synergies (Bischoff, Fox, & Quigley, 2016).

Thus, the healthcare industry differs from other industries on multiple areas. The underlying demand for healthcare, high regulations and high research and development costs are determining factors for this industry. However, are specialized and well connected PE firms able to perform better in cross-border deals, possibly through their international network and experience? From these observations, we compose the last hypothesis:

5. *In cross-border healthcare deals, takeovers that involve either private equity-backed targets or acquirers perform better than other acquisitions.*

In the next section, section 2, we will review literature on the current state of private equity, private equity involvement and performance, and private equity in the healthcare industry. In section 3 we elaborate more on the data we use and in section 4 the methodology we apply on the data. In section 5 we present our results and in section 6 we conclude the paper with our conclusion and a discussion on the limitations of our research.

Figure 1: Conceptual model
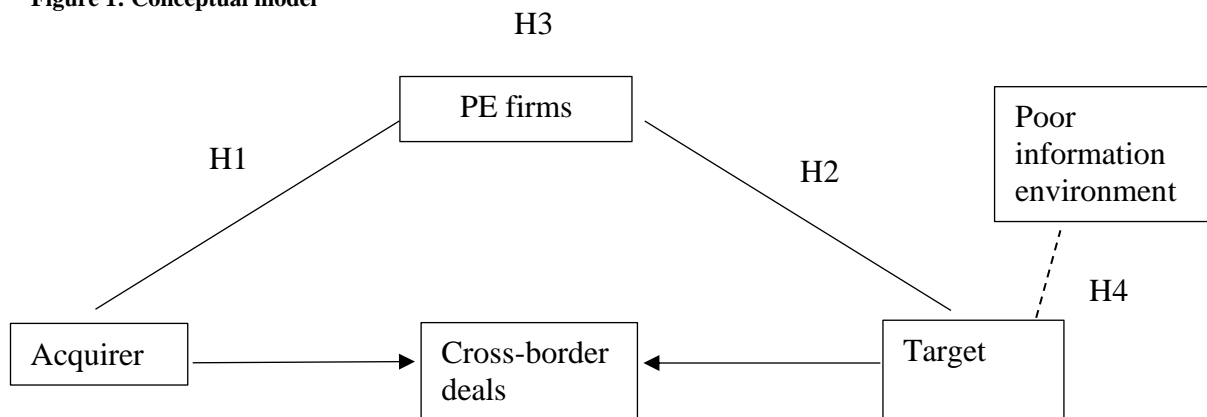
2. Literature review

In this section, we discuss the current state of the literature on cross-border M&A, private equity firms and the healthcare industry.

2.1 Private Equity versus broader M&A market

First off, we elaborate more on the role of PE in the broader M&A market. Traditionally, multinational enterprises (MNEs) perform most cross-border M&A deals (e.g. Baziki, Norbäck, Persson & Tåg, 2017). However, as we will discuss in paragraph 2.2, cross-border PE deal value and deal count are on the rise. To understand why PE could add value, we first have to explain how PE differs from these MNEs.

We start with a difference in time frames. Where MNEs often seek long-term growth in their targets, the investment horizon of PE acquirers is finite (e.g. Baziki et al., 2017). PE investors buy a company to sell the company within a set period of time. Because of the limited time frame and intent of selling the company, PE firms need to account for the cost of selling the company. Also, an advantage of the MNEs long-term growth strategy is firm-specific synergies, which add extra value to a target company (Bischoff et al., 2016). As a result of possible synergies, MNEs can be more willing to pay higher valuations. Furthermore, MNEs have access to internal capital markets. For this reason, the MNEs rely on outside investors to a lesser extent. In contrast, PE firms typically invest with high levels of debt from outside investors (e.g. Baziki et al., 2017). Because of these differences, MNEs are a competitive opponent for PE firms. However, in paragraphs 2.3-2.5 we will elaborate on the possible advantages of PE firms.

2.2 Current state of cross-border Private Equity

In this paragraph we explain the current situation of cross-border PE. In the 1990s, Kaplan and Stein (1993) found evidence for high correlation between PE transaction volume and economic cycles in the 1980s. In the following years, during the 1990s, cross-border PE snowballed through accelerated economic expansion (Baygan & Freudenberg, 2000; Talmor & Vasvari 2011). Furthermore, developments in new internet and technologies raised PE interests and resulted in a PE boom around the year 2000. Due to an overallocation of funds in the US during the dotcom bubble, US PE firms went cross-border in a search for investment opportunities. Aizenman and Kendall (2012) showed that as a result of the dotcom bubble, the

US gained global dominance on the cross-border PE market. When the dotcom bubble burst, cross-border PE activity also declined naturally.

Around 2003, cross-border PE started to gain momentum again. The total global PE deal value and deal count rose tremendously, with the US at the front and Europe catching up (Bain, 2019). The deal count and deal value were unprecedented in 2006 and 2007, as a result of a new wave of investor interest, supported by generous equity markets and GDP growth in the US and Europe (Bain 2019). During the next economic crisis (starting late 2007), deal value and count plunged again. Although PE firms are often criticized for their structure (e.g. Davidoff, 2008), recent research (Bernstein, Lerner & Mezzanotti, 2019) on the fragility of PE-backed firms during the financial crisis found that they might have gained insights from earlier crises. Through available resources and relationships of the PE sponsors, PE-backed firms might have been able to decrease investments less than the control group during the financial crisis. The relative increase in investments might have led to increased asset growth and higher market shares (Bernstein et al., 2019).

Despite divided opinions on PE, traction accompanied by deal value and deal count have been on the rise again since 2010 (Bain, 2019). The numbers are rising towards pre-crisis levels, but growth levels have turned flatter in recent years. Firms took lessons from the crisis on what held up well and are adjusting strategies accordingly. Even within the healthcare sector, generally viewed as resilient during crises, performance between subsectors was significantly different (Bain, 2019). Current challenges in the PE field against the general M&A market include high multiples, lack of appetizing targets and rough competition from strategic buyers (Bain, 2019). For this reason, we research the last decade of cross-border M&A transactions.

2.3 The likelihood of cross-border M&A and PE backing

As discussed above, even though PE used to be mostly an US phenomenon until the 1980s, nowadays, PE has internationalized more than ever (e.g. Aizenman & Kendall, 2012). Now that PE firms have broad international portfolios, potential network effects may occur. These network effects could increase the likelihood of a PE-backed company to target or acquire foreign companies than their counterparts (hypothesis 1 & 2).

2.3.1 Network effects

Network effects occur when the value of a unit increases with the number of units in the network. As the network increases, more value is added for the units within the network (Farrell et Saloner, 1985; Economides, 1996). Portfolio companies could take advantage of the international networks PE firms have to offer on either the acquirer or target side. Ferreira, Massa and Matos (2010) found supporting evidence that foreign institutional ownership increases the probability that a merger deal is cross-border, successful, and the bidder takes full control of the target firm. Foreign institutional investors promote international relationships and reduce information asymmetry between and transaction costs, thus promoting global financial integration (Massa & Matos, 2010).

Private equity-backed acquirers could use their international network to locate and assess possible targets. Furthermore, acquirers might also use this network to help raise financing. On the other hand, private equity-backed targets could also use their network to find potential acquirers. These network effects could increase the likelihood of PE-backing on both sides of a deal.

2.4 PE performance in cross-border M&A

As mentioned in the previous section, international PE networks could potentially increase the likelihood of cross-border deals. In addition, PE firms might influence the performance of cross-border deals (hypothesis 3 & 4). Yet, the cause of PE performance is controversial. We discuss channels through which PE-backing can affect the performance of a deal.

2.4.1 Governance synergies

First off, governance synergies could arise when companies are PE-backed. PE firms align the board with the needs of the company through incentives and construct appropriate board structure and culture, improving the overall management of the company. Portfolio companies can be better off with the improvement in governance PE firms have to offer. Davis et al. (2014) proposed that high-level managerial skills of PE firms increase productivity in portfolio companies, together with improved monitoring and operational practices. In their studies, Davis et al. (2014) researched PE acquisitions in US firms and found PE management excelled in scaling productive plants and closing unproductive plants.

In contrast, Smith (2015) found results supporting claims that PE mostly selects already successful and productive firms and support those only with financing to grow. Smith (2015) suggested PE firms provide no high-level managerial skills. A point worth noting is that Smiths results are based on India. As a developing country, results may differ from more developed countries as overall management scores for India are relatively low compared to; for instance, the US (Bloom et al., 2012) .

2.4.2 Information asymmetry

Secondly, information asymmetries are a fundamental problem in many M&As. Acquiring companies valuate targets resources and subsequently need to agree on a price with the target. Through a process of due diligence, the acquirer obtains information about the target and their resources. An accurate valuation of the target is essential for a deal to be successful for the acquirer. However, a more in-depth understanding of the target and their resources can be difficult to obtain. Often time pressure, organizational complexity and, especially in cross-border M&As, geographic distance add barriers to the valuation. In contrast, the target company is usually, logically, well aware of its assets and circumstances. Hence, due to information asymmetries uncertainty about the quality of companies occur in the cross-border M&A market.

2.4.2.a Market for lemons

Akerlof (1978) conceptualized the idea of quality under uncertainty and asymmetric information in what he called the market for 'lemons'. In the market for lemons, buyers of used cars are uncertain about the quality of the car. The M&A market shows similarities to Akerlof's market for lemons, as buyers are uncertain of the quality of the target companies. Akerlof (1978) concludes that preconditions for trade are trust and informal, unwritten guarantees. As PE firms are repeated buyers and sellers, reputational incentives might be present. These incentives might result in more transparency about the value of the target. Naturally, if a PE firm is shown to be trustworthy and transparent in deals, it could yield an advantage in future deals.

As a consequence of these reputational incentives, the informational asymmetries might improve. Transaction costs of obtaining information and uncertainty decrease. Thus, PE-backed firms may perform more successful deals.

2.4.2.b Signalling theory

Spence (1978) also elaborated on information asymmetries, through the theory of information gaps in the job market via signalling theory. Employers are uncertain of the ability of potential employees. Spence (1978) found that even if employees education is not of a direct impact on their productivity, it could be of value for both the employers and employees. The education credentials could signal higher productivity of the employees. For PE-backed targets, the same comparison can be drawn. The backing of a PE firm could be a form of credentials, which signal high value and transparency towards potential buyers. Via this channel, PE-backing could also result in more successful deals.

2.4.3 Poor information environments

At last, poor information environments might also be a factor in the performance of cross-border PE. In their recent paper, Tang and Li (2018) researched Chinese A-listed companies engaged in transactions during 2013 and 2014. First off, Tang and Li (2018) found results supporting the signalling theory of PE-backing mentioned above in the Chinese M&A market. Furthermore, findings showed that with targets located in poor information environments, the signalling role of PE firms is even more significant (Tang & Li, 2018). The explanation for this is the enlarged information gap for targets in poor information environments. Especially in these environments, it is more difficult and costly for acquirers to obtain information. As a result, PE firms credentials show their strength.

2.5 Private equity performance in the healthcare sector

In the introduction, we described how the healthcare sector shows differences compared to other industries. We found high regulations, complex industry structures and underlying demand to be determining and specific for this industry. As PE involvement in healthcare is proliferating, the value of PE healthcare acquisitions increased 187% from 2010 to 2017. Also, healthcare PE deal value reached 42.6 billion dollars, resulting in increased attention of researchers and policymakers (Gondi & Song, 2019).

Opponents pronounce concerns around patient safety, overutilization and practice instability. On the other hand, proponents voice possible benefits through efficiency, as healthcare is known for a system burdened with waste (Gondi & Song, 2019). In the next sections we first elaborate more on industry clustering in M&A, and after that we look further into the resilience of the healthcare sector. We discuss how PE backing could influence performance of cross-border deals in the healthcare sector (hypothesis 5).

2.5.1 Industry clustering

For industry clustering, Mitchell and Mulherin (1996) find evidence that merger activity clusters by industry. Industry shocks, and especially deregulation, became even more important. Andrade, Mitchell and Stafford (2001) find evidence that suggests deregulation accounted for nearly half of the merger activity in the 1990s. As healthcare is a heavily regulated industry, with a trend of opening up for competition and deregulation (Gaspar, Ikkersheim and Koolman, 2019), this industry could be especially susceptible to industry shocks.

2.5.2 Resilience

As described in the introduction, an essential factor for the resilience of the industry is the underlying demand for healthcare, combined with a global ageing and rising incomes in emerging markets. Furthermore, some hospitals and health systems seem to fall into the category 'too big to fail' and are expected to receive government support in difficult times. As a result, a growing trend for PE within the healthcare industry in the United States is to buy large not-for-profit systems and turn those into for-profit systems (Beckers Hospital Review, 2011).

2.5.3 Healthcare governance

In the introduction of this paragraph, we mention Gondi & Song (2018) referring to the healthcare sector known for a system burdened with waste. In this same context, Jamali, Hallal & Abdallah (2010) perform an investigation on the corporate governance practices in the healthcare sector. Findings show that for-profit health institutions have smaller boards, which, in theory, could make them more effective. However, Jamali, Hallal & Abdallah (2010) also find that these boards are mainly composed of insiders, which may lead to several deficiencies, including a conflict of interest, lack in the monitoring role of the board and accountability. All in all, this would mean compromised corporate governance and thus, a situation where the governance synergies of PE firms could especially come in handy. Though, it is important to note that Jamali, Hallal & Abdallah's (2010) paper is based on Lebanese hospitals, and for that reason, external validation might be limited. International research on this subject would the increase external validity.

3. Data

The database we use for this research is ThomsonOne. The sample consists of 3355 mergers and acquisitions deals announced within the last decade, from 2010 up until the end of 2019.

The deal is required to be completed, and the percentage of shares owned after the transaction has to lay between 95 to 100 per cent. The deal value must be higher than one million dollars. ThomsonOne can flag private equity activity on either the side of the acquirer or target, which makes for dummy variables of PE activity acquirer side, PE activity target side and PE activity on acquirer and target side. Also, we control for the method of payment and size, as research suggests that the method of payment can influence whether M&A returns are positive (Mitchell & Mulherin, 1996).

Furthermore, we remove deals in the financial and utility sector, as these sectors are highly regulated and consist of different equity structures (Fama & French (1992) and Kalemli-Ozcan, Sorensen & Yesiltas (2012)). A restriction in the research is that we only use acquirers from the United States as this will help retrieve data on the abnormal returns for these companies. We use the Wharton Research Data Services database for the event studies on the market model cumulative abnormal returns (CAR) of the acquirers (Campbell et al., 1997). We match these abnormal returns with the dataset retrieved from Thomson One, which results in data on the abnormal returns of 3355 deals.

Next, we proxy for poor governance countries. For this, we use The World Bank's Governance Index database. This index is based on over 30 underlying data sources measuring levels of corruption and government effectiveness. We use the regulatory quality index. This reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. We create a dummy variable for low regulatory quality countries based on countries who score below 1,55 on the regulatory quality index (below average).

At last, we need to compare healthcare deals to the general subset of deals. We define healthcare deals based on their SIC codes. We include target and acquiring companies with the following SIC codes as healthcare companies: 5912 (Retail-Drug Stores and Proprietary Stores), 2834 (Pharmaceutical Preparations), 8000-8100 (health related services), 6321 (accident and health insurances).

As illustrated by table 1, out of the total 3355 deals in our sample, 23,1% are cross-border deals. In the total sample, PE backing occurred in for 10,4% of the deals on the acquiring side, and for 17,7% on the target side. As a result, PE backing of any kind was involved in 26,3% of the deals.

Table 1 – Distribution of PE deals

PE involvement	Domestic (N=2578)	Cross-border (N=776)	Total (N=3355)
Acquirer side	289	60	349
	11,21%	*7,73%*	*10,40%*
Target side	450	143	593
	17,46%	*18,43%*	*17,68%*
Any side	695	187	882
	26,95%	*24,10%*	*26,29%*

In tables 2 and 3, we take a subset of the total sample. Table 2 displays summarized summary statistics for the subset of PE backed deals on the acquiring side and table 3 shows the summary statistics for the subset of PE backed deals on the target side. When comparing tables 1, 2 and 3 we find some remarkable differences among which the company financials of the acquiring company.

We start with comparing average deal sizes for the subsamples. We find the average for deal size where PE backing on the acquirer side is involved (537M$) to be lower than both the deal size of deals with PE backing on the target side (759M$) and the total sample (609M$). When looking further into tables 1, 2 and 3, we find that the size differences of the deal size also translate in size of company financials of the acquirer. For deals with PE involvement on the acquiring side, average company financials of the acquiring company such as assets (2.072M$), CAPEX (64M$), cash holdings (161M$), long term debt (672M$) and EBITDA (258M$) are lower than averages of the sample and subsample of PE involvement on the target side.

Table 4 compares the total number of deals to the total number of PE-backed deals for each year of our sample. As we discussed in our introduction, we see an increase in the number of PE-backed deals for the years 2010 up until 2015. After 2015, we see the number of PE-backed deals in our sample decrease. However, if we look at the percentage of PE backed deals, we find that this percentage has remained around the 30%, except for 2016. Reason for this is that the number of non-PE backed deals decreased even more than the number of PE-backed deals.

4. Methodology

In this section, we discuss the methodology we use to research our hypotheses. We start with the first and second hypotheses. To test whether PE-backed acquirers or targets are more likely to acquire foreign targets, we estimate two types of logit regressions. For the first logit regression, the dependent variable is a dummy that equals one if a deal is cross-border. The main variables in the regression are dummy variables related to whether either the acquirer side, target side or any side involves PE. We will use control variables that may explain why M&A transactions are cross-border or domestic, including acquirer size, leverage, cash holdings, free cash flow and capital expenditures (CAPEX). Also, we add deal-specific control variables. These include deal size, a dummy for a payment type (cash deal, stock deal and a combination of cash and stock deal) and a dummy for solicited deals. At last, we add year dummies. These year dummies help control for the effects of time-invariant variables with time-invariant effects. The models for PE any side, PE acquirer and PE target will look as follows:

$$CrossBorderM\&A_i$$
$$= \alpha + \beta_1(PE\ any\ side)_i + \beta_2(Deal\ Size)_i + \beta_3(Stock\ Deal)_i$$
$$+ \beta_4(Cash\ Deal)_i + \beta_5(Cash\ and\ Stock\ Deal)_i + \beta_6(EBITDA/Assets)_i$$
$$+ \beta_7(LT\ Debt/Assets)_i + \beta_8(Cash/Assets)_i + \beta_9(LN(Assets))_i + \varepsilon_i$$

For the third and fourth hypothesis, we need to find the CARs of the acquirers. We calculate the CARs following M&A literature (e.g. Masulis, Wang & Xie (2007)), with an OLS estimation of the market model over a period from 11-days to 210 days before the deal and an estimation window of five days before and after the deal.

After finding the CARs for the M&A deals, we run a regression with the CARs as the dependent variable. The main variables will again be the dummy variables related to whether the side of the acquirer, target or both involve PE. Furthermore, the same control variables will be added as in the logit regression for hypothesis one and two. Also, we add a dummy variable that equals one if the target is from a poor governance country. We proxy a poor governance country with the World Bank's Governance Index and consider the lowest 25 percentile of the index as poor governance countries. Also, we add interaction terms to PE backing on any side and both the acquirer and target side to investigate the effect of poor

governance countries on the returns on the PE backing. For each regression model we test the residuals on heteroskedasticity using the Breusch-Pagan test. If the null hypothesis is rejected, we apply robust standard errors. We run regressions on PE any side, PE acquirer and PE target of the following kind:

$$CAR_i = \alpha + \beta_1(PE\ any\ side)_i + \beta_2(Deal\ Size)_i + \beta_3(Stock\ Deal)_i + \beta_4(Cash\ Deal)_i$$
$$+ \beta_5(Cash\ and\ Stock\ Deal)_i + \beta_6(EBITDA/Assets)_i$$
$$+ \beta_7(LT\ Debt/Assets)_i + \beta_8(Cash/Assets)_i + \beta_9(LN(Assets))_i + \varepsilon_i$$

For the fourth and fifth hypotheses we add interaction terms as follows:

$$CAR_i = \alpha + \beta_1(PE\ any\ side)_i + \beta_2(PE\ any\ side)_i \times (low\ RegQuality)$$
$$+ \beta_3(low\ RegQuality)_i + \beta_4(Deal\ Size)_i + \beta_5(Stock\ Deal)_i$$
$$+ \beta_6(Cash\ Deal)_i + \beta_7(Cash\ and\ Stock\ Deal)_i + \beta_8(EBITDA/Assets)_i$$
$$+ \beta_9(LT\ Debt/Assets)_i + \beta_{10}(Cash/Assets)_i + \beta_{11}(LN(Assets))_i + \varepsilon_i$$

To investigate the effect of cross-border PE backing in the healthcare sector, we run a regression similar regression as described in the previous paragraph. However, for this regression we look at the effect PE backing on the CARs for companies in the healthcare sector. Thus, we add healthcare sector as an independent variable and add interaction terms for PE backing on any side, acquirer and target side. Here we again use year dummies to control for omitted variable bias. Also, we again use robust regressions to control for outliers in our data.

5. Results

In this section we will discuss the results of our analysis. We start with the results for our hypotheses on the likelihood of PE backing in cross-border deals. Then, we analyze the effect of PE backing on cross-border performance and zoom in on this effect for poor governance countries. At last, we discuss results for the hypothesis that cross-border healthcare deals perform better when backed by PE.

5.1 Likelihood of PE backing in cross-border deals

In section 2, we hypothesize that PE-backed acquirers could use their international network to locate and assess possible targets (Hypothesis 1), and PE-backed targets could use their network to find potential acquirers (Hypothesis 2). For this reason, both PE-backed acquirers and targets would be more likely to be acquired by or acquire PE-backed targets or acquirers. In table 6, we find the results of our logit regression for these hypotheses.

In contrast to what we hypothesized, the regression results in table 6, column 2 show that PE-backed acquirers are less likely to be involved in cross-border M&A deals. PE-backed acquirers have a 23% lower probability[1] of being involved in cross-border deals. Results for both PE-backing on any side and target side are not significant. Furthermore, our findings suggest that acquiring companies with more cash holdings have a considerable increase in the probability of being involved with cross-border deals. On the other hand, our results indicate that acquiring companies with more long term debt have a large decrease in the probability of being involved with cross-border deals. At last, we find that deals paid with both cash and stock see a decrease in likelihood of being cross-border.

5.2 PE performance in cross-border deals

Hypothesis 3 states acquisitions with PE-backed targets or acquirers perform better in cross-border deals compared to other acquisitions. We proposed this could be the result of governance synergies and information asymmetries.

Before we look further in to cross-border deals, we first compare returns in domestic M&A deals. In table 7 column 2, we find evidence for a negative impact (-0,013) of PE backing on the acquirers side. However, column 3 displays results in favor of PE backing on

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[1] Economic effect is calculated using logit regression estimates: exp(-0,297)/ (1 + exp(-0,297))

the target side. Effects of PE backing on the target side show a positive coefficient of 0,008. Besides, table 7 shows cash holdings negatively influence returns in domestic deals.

Now we turn our attention to takeover returns in cross-border deals. Table 8, column 1, 2 and 3 display regression results for CARs in cross-border deals. We find no significant effect of PE backing on either target, acquirer or any side on the returns. These results are comparable to earlier findings, for instance by Kaplan and Schoar (2005). Kaplan and Schoar (2005) found that, on average, PE firms did not outperform the broader market (in the time period 1980-1997). PE firms not outperforming the broader market would explain why we find no significant results.

However, in columns 4, 5 and 6, we add interaction terms for regulatory quality. Here we find significant effects for PE backing on any side and the interaction term for PE backing on any side with regulatory quality. The results in column 4 show support for our hypothesis, suggesting PE involvement on any side in cross-border deals has a positive (2,16%) effect in high regulatory country countries. However, contrary to our hypothesis , we find that the combined impact of PE involvement on any side and poor country governance has a negative effect of 2,30%[2] Furthermore, the findings in column 6 show PE backing on the target side has a positive influence (2,10%) on the returns. These findings are in favour of our hypothesis that PE involvement in cross-border deals positively influences deal performance. However, when looking at PE-backed targets in poor governance countries, we find the economic effect to be negative 1,33%[3]. Cumming, Schmidt & Walz (2004), seem to clarify our findings by explaining legal systems have a strong impact on the PE investment patterns and governance structures. As a result of better laws, deals would be better facilitated, increased likelihood of networks and reduce damaging co-investments according to Cumming et al. (2004).

5.3 PE performance in the healthcare sector
At last, we investigate the effect of PE involvement in cross-border deals within the healthcare sector (Hypothesis 5). We proposed PE firms could create value through governance synergies in the healthcare sector, as compromised governance would reign

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[2] Economic effect is calculated using regression estimates: -4,47 + 2,17 = -2,30%
[3] Economic effect is calculated using regression estimates: -3,43 + 2,10 = -1,33%

especially in this sector. Unlike our hypothesis suggests, table 9 shows no significant support for increased returns in PE involved cross-border deals in the healthcare sector. We do find significantly negative effects of cash on the deal performance for all models. Also, we find a significantly negative effect of long term debt on performance in columns 1 and 3.

6. Conclusion & Discussion

6.1 Findings

This paper is an extension of previous research on cross-border M&A, and looks at the effects of private equity firms. We use a probit model to investigate the effect of PE involvement on the likelihood of a cross-border deal. Contrary to our hypotheses, we find PE backed acquirers have a lower chance of being involved in a cross-border deal. For PE backing on the target side we find no significant effects. From our probit model we also learn cash holdings have positive effects on the likelihood of a deal being cross-border, while long term debt has a negative effect.

Next, we research the effect of PE involvement on the performance of cross-border deals. When controlling for low governance countries, results show support for our hypothesis that PE involvement on any side has a positive effect on cross-border deal performance. However, we also proposed PE involvement would increase deal performance especially when the target is located in poor governance countries. Our results findings do not confirm this proposition. At last, we do not find support for our hypothesis that PE involvement increases cross-border deal performance in the healthcare sector.

6.2 Discussion

The data sample we used in this research consisted of US only publicly listed acquirers. As a recommendation for future research, acquirers should be not restricted to the US only, for external validation purposes. Next, PE firms have a short investment horizon. We looked at short term stock returns, but in order to look at the total performance PE firms in cross-border deals, further research should look at the performance and effects of the deals in five to ten years after the deal. This more extended period would also allow statistical techniques that are better able to find the cross-sectional correlation. These statistical techniques then account better for common shocks in merger activity.

Furthermore, future research should look more into endogeneity problems. Possibly, PE involved cross-border deals could differ systematically from other deals. We controlled for acquirers size, but also acquirers size relative to target could be added to the control variables. Propensity scores techniques should be applied to test for possible systematic differences. Furthermore, we proxied for poor governance countries based on the regulatory quality index from The World Bank's Governance Index database. Proxies for poor

governance could be extended with more of The World Bank's Governance Index database's indicators, for instance: government effectiveness, the rule of law and control of corruption.

At last, differences within PE companies should be accounted. Some PE firms might have a privileged access to better deals compared to other PE firms. Older, more established PE firms might gain a larger network over time. Experience from previous deals could result in a more valuable network for established firms, while newer firms do not have the same network effects. Thus, it would be interesting to see if more established PE firms enjoy increased network effects and the possible effects on performance of these effects compared to less experienced firms.

7. References

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Appendix

Table 2 – Mean min, max, SD of N of independent variables of total sample

Variable name	N	Mean	SD	Min	Max
DealSize	3355	609,640	2651,550	1	79376,830
Regulatory Quality	3355	1,548	0,287	-0,876	2,206
Assets	3355	8137,798	37682,220	0	751216
CAPEX	3355	240,321	1093,908	-0,564	16458
Cash	3355	720,715	3722,805	0	78958
LTDebt	3355	1791,812	14222,320	0	324782
Ebitda	3355	1147,618	3793,983	-666,676	40802
Liabilities	3355	4604,144	28609,130	0	627018
Dummy variables					
I(Crossborder)	3355	0,231	0,422	0	1
I(PE acquirer)	3355	0,104	0,305	0	1
I(PE target)	3355	0,177	0,382	0	1
I(PE anyside)	3355	0,263	0,440	0	1
I(Cash Deal)	3355	0,633	0,482	0	1
I(Stock Deal)	3355	0,022	0,147	0	1
I(Cash and Stock deal)	3355	0,118	0,323	0	1
I(Solicited)	3355	0,994	0,077	0	1

Table 3 – Mean min, max, SD of N of independent variables of PE backed acquirer side

Variable	N	Mean	SD	Min	Max
DealSize	349	537,959	2.383,803	1,989	35.031,870
Regulatory Quality	349	1,551	0,230	-0,313	1,929
Assets	349	2.072,221	4.730,691	0	49.953
CAPEX	349	64,345	239,574	0	4.025
Cash	349	161,337	411,530	0	5.891
LT Debt	349	672,965	1.694,322	0	22.441
EBITDA	349	258,916	667,483	-350	4.783
Liabilities	349	1.252,568	3.010,242	0	35.708
Dummy variables					
I(Crossborder)	349	0,172	0,378	0	1
I(PE acquirer)	349	1,000	0,000	1	1
I(PE target)	349	0,172	0,378	0	1
I(PE anyside)	349	1,000	0,000	1	1
I(Cash Deal)	349	0,579	0,494	0	1
I(Stock Deal)	349	0,034	0,182	0	1
I(Cash and Stock Deal)	349	0,209	0,407	0	1
I(Solicited)	349	0,997	0,054	0	1

Table 4 – Mean min, max, SD of N of independent variables of PE backed target side

Variable	N	Mean	SD	Min	Max
DealSize	593	759,839	1,598	1,989	1,612
RegulatoryQuality	593	1,551	0,238	-0,540	2,206
Assets	593	10.016,200	47.486,600	7,387	751.216,000
CAPEX	593	280,258	1.155,335	0	16.458
Cash	593	895,025	4.816,131	0	78.958
LTDebt	593	2.429,171	19.108,530	0	324.782
Ebitda	593	1.353,975	4.109,984	-78	40.802
Liabilities	593	5.954,944	37.626,880	1	627.018
Dummy variables					
I(Crossborder)	593	0,241	0,428	0	1
I(PE acquirer)	593	0,101	0,302	0	1
I(PE target)	593	1,000	0,000	1	1
I(PE anyside)	593	1,000	0,000	1	1
I(Cash Deal)	593	0,664	0,473	0	1
I(Stock Deal)	593	0,008	0,092	0	1
I(Cash and Stock Deal)	593	0,101	0,302	0	1
I(Solicited)	593	0,990	0,100	0	1

Table 5 – Distribution of PE deals per year

Year	Non-PE backed Deals	PE-backed deals	Total N per year	% PE backed per year	Cumulative of total
2010	296	62	358	17%	10.67%
2011	301	75	376	20%	21.88%
2012	278	125	403	31%	33.89%
2013	267	98	365	27%	44.77%
2014	294	100	394	25%	56.51%
2015	249	111	360	31%	67.24%
2016	244	74	318	23%	76.72%
2017	200	83	283	29%	85.16%
2018	192	92	284	32%	93.62%
2019	152	62	214	29%	100.00%
Total	2,473	882	3355	26%	

Table 6 – Logit regression

Dependent Variables	I(Cross-Border M&A)		
Sample of M&A deals	[1]	[2]	[3]
PE Any side	-0,097		
	[0,327]		
PE Acquirer		-0,297*	
		[0,061]	
PE Target			0,074
			[0,505]
LN(Assets)	0,170***	0,164***	0,169***
	[0,000]	[0]	[0]
EBITDA/Assets	-0,007	-0,025	0,005
	[0,972]	[0,905]	[0,983]
LTDebt/Assets	-1,276***	-1,234***	-1,301***
	[0,000]	[0,000]	[0,000]
Cash/Assets	1,439***	1,511***	1,424***
	[0,000]	[0,000]	[0,000]
Deal Size	0***	0***	0***
	[0,001]	[0,001]	[0,001]
Regulatory Quality	-1,260***	-1,265***	-1,260***
	[0,000]	[0,000]	[0,000]
Sollicited	-0,157	-0,142	-0,144
	[0,785]	[0,805]	[0,804]
Cash Deal	-0,121	-0,120	-0,120
	[0,245]	[0.250]	[0,246]
Stock Deal	-0,899	-0,889	-0,883**
	[0,022]	[0,024]	[0,025]
Cash and Stock Deal	-0,680***	-0,673***	-0,682***
	[0,000]	[0,000]	[0,000]
Year fixed effects	YES	YES	YES
Observations	3355	3355	3355
Pseudo R-Squared	6,34%	6,41%	6,32%

*10% significance level, **5% significance level, ***1% significance level

Table 7 – Returns in domestic M&A deals: Regression Analysis

Sample of M&A deals used	Domestic M&A		
	[1]	[2]	[3]
I(PE Any side)	-0,001		
	[0,879]		
I(PE Acquirer)		-0,013*	
		[0,094]	
I(PE Target)			0,008*
			[0,091]
Deal Size	0,000	0,000	0,000
	[0,220]	[0,245]	[0,226]
Cash Deal	-0,005	-0,005	-0,006
	[0,209]	[0,216]	[0,194]
Stock Deal	-0,005	-0,005	-0,005
	[0,794]	[0,814]	[0,818]
Cash and Stock Deal	0,009	0,010	0,009
	[0,299]	[0,258]	[0,302]
Solicited	0,020	0,021	0,022
	[0,394]	[0,375]	[0,356]
EBITDA/Assets	-0,034	-0,035	-0,034
	[0,211]	[0,201]	[0,211]
LT Debts/Assets	0,005	0,007	0,005
	[0,646]	[0,513]	[0,676]
Cash/Assets	-0,039**	-0,034*	-0,039**
	[0,037]	[0,060]	[0,041]
LN(Assets)	-0,003***	-0,004***	-0,004***
	[0,001]	[0,000]	[0,000]
Year fixed effects	YES	YES	YES
Observations	2.579	2.579	2.579
R-Squared	2,61%	2,78%	2,71%

10% significance level, **5% significance level, ***1% significance level

Table 8 - Returns in Cross-Border M&A Deals: Regression Analysis

Sample of M&A deals used	Cross-border returns					
	[1]	[2]	[3]	[4]	[5]	[6]
I(PE Any side)	0,006			0,022***		
	[0,366]			[0,005]		
I(PE Acquirer)		-0,002			0,015	
		[0,835]			[0,275]	
I(PE Target)			0,008			0,021***
			[0,216]			[0,009]
I(PE anyside) x I(Low RegQuality)				-0,045***		
				[0,001]		
I(PE acquirer) x I(Low RegQuality)					-0,049**	
					[0,031]	
I(PE target) x I(Low RegQuality)						-0,034**
						[0,014]
Deal Size	0,000	0,000	0,000	0,000	0,000	0,000
	[0,659]	[0,700]	[0,658]	[0,569]	[0,654]	[0,604]
Cash Deal	0,004	0,003	0,004	0,004	0,003	0,004
	[0,503]	[0,532]	[0,487]	[0,513]	[0,558]	[0,457]
Stock Deal	-0,017	-0,019	-0,018	-0,020	-0,020	-0,020
	[0,742]	[0,715]	[0,730]	[0,693]	[0,703]	[0,692]
Cash and Stock Deal	0,000	0,000	0,000	-0,001	-0,001	0,000
	[0,994]	[0,998]	[0,980]	[0,969]	[0,932]	[0,994]
Solicited	-0,003	-0,001	-0,003	-0,007	-0,003	-0,006
	[0,900]	[0,968]	[0,889]	[0,767]	[0,905]	[0,811]
Low RegQuality	0,004	0,005	0,004	0,016**	0,009	0,011*
	[0,434]	[0,396]	[0,441]	[0,013]	[0,126]	[0,082]
EBITDA/Assets	-0,006	-0,007	-0,006	-0,009	-0,011	-0,008
	[0,678]	[0,605]	[0,671]	[0,520]	[0,423]	[0,575]
LT Debts/Assets	-0,039*	-0,037	-0,038*	-0,040*	-0,037	-0,037*
	[0,082]	[0,103]	[0,088]	[0,078]	[0,109]	[0,094]
Cash/Assets	-0,058**	-0,057**	-0,056**	-0,055**	-0,056**	-0,053**
	[0,031]	[0,031]	[0,037]	[0,037]	[0,034]	[0,045]
LN(Assets)	-0,001	-0,001	-0,001	-0,001	-0,001	-0,001
	[0,533]	[0,534]	[0,480]	[0,538]	[0,523]	[0,498]
Year fixed effects	YES	YES	YES	YES	YES	YES
Observations	776	776	776	776	776	776
R-Squared	3,13%	3,03%	3,21%	4,69%	3,77%	3,97%

*10% significance level, **5% significance level, ***1% significance level

Table 9 - Performance of PE backing in healthcare sector

Sample of M&A deals used	[1]	[2]	[3]
PE anyside	0,007		
	[0,322]		
PE acquirer		-0,004	
		[0,710]	
PE target			0,010
			[0,150]
PE anyside x Healthcare	-0,019		
	[0,601]		
PE acquirer x Healthcare		0,030	
		[0,249]	
PE target x Healthcare			-0,031
			[0,434]
Target Healthcare	0,001	-0,005	0,002
	[0,888]	[0,606]	[0,787]
DealSize	0,000	0,000	0,000
	[0,680]	[0,680]	[0,696]
Cash Deal	0,004	0,003	0,004
	[0,502]	[0,556]	[0,475]
Stock Deal	-0,017	-0,019	-0,019
	[0,733]	[0,715]	[0,714]
Cash and Stock Deal	0,000	-0,001	0,000
	[0,982]	[0,972]	[0,992]
Solicited	-0,003	-0,001	-0,003
	[0,903]	[0,966]	[0,893]
Low RegQuality	0,005	0,005	0,005
	[0,417]	[0,378]	[0,428]
EBITDA/Assets	-0,008	-0,006	-0,009
	[0,602]	[0,718]	[0,543]
LT Debts/Assets	-0,040*	-0,036	-0,039*
	[0,077]	[0,117]	[0,079]
Cash/Assets	-0,058**	-0,055**	-0,056**
	[0,029]	[0,036]	[0,036]
LN(Assets)	-0,001	-0,001	-0,001
	[0,503]	[0,583]	[0,432]
Year fixed effects	YES	YES	YES
Observations	776	776	776
R-Squared	3,18%	3,12%	3,33%

*10% significance level, **5% significance level, ***1% significance level