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Introduction

Analyzing the M&A process is crucial to grasp the drivers behind M&A success (Haspeslagh & Jemison, 1991). Until now, academics mainly focused on the post-acquisition process. However, research is necessary and desirable in the pre-acquisition phase as well. Nowadays still one out of four M&As is not led to completion (Dikova, Sahib & Van Witteloostuijn, 2010). Moreover Dikova et al. (2010) suggest further research in deal duration, as it will enrich our knowledge of the M&A process. Deal duration, the time interval between the M&A public announcement and its completion, has been mostly kept out of academics' agendas. A few papers discussed the drivers of deal duration, but none of them investigated antecedents of private targets exclusively. Until now the focus mainly has been on public companies acquiring public targets (Luypaert & De Maeseneire, 2015; Ekelund, Ford & Thornton, 2001). However, knowing which drivers influence deal duration of public companies acquiring private target is crucial because more than 60% of M&As executed involve the purchase of a private firm (Capron & Shen, 2007).

Limiting the deal duration by being aware of its determinants can benefit the acquirer in several ways. First, it involves fewer costs. This is essential as deal expenditures can rise to six percent of the M&A value (Ferreira, Borini, Vicente & Almeida, 2017). Second the acquirer can focus faster on its daily operations. This can prevent that the company misses out on future business opportunities. Lastly, competitors are kept out of the game due to the short time allowed to react. Moreover, shareholders benefit faster from the M&A advantages (synergies, market power, etc.).

The goal of this paper is, thus, first to identify the determinants of deal duration for public companies acquiring private targets. In the next phase these determinants are compared to the drivers of public targets to identify similitudes and differences. The determinants being investigated in this paper are the following: deal complexity, information asymmetry, likelihood of overpaying, and prior M&A experience. To perform this study a sample of 6065 M&As between U.S. public companies and U.S. targets was used.

These findings will be useful for companies to adapt their strategy depending on the public status of the target. Moreover, it will help merging companies to go through a smoother M&A process and consequently complete the M&A faster.

1 Literature study

Since a few decades, academics investigate mergers and acquisitions (M&As). Thanks to this great interest M&A literature exists in abundance; however, it is highly dispersed. Deals have been analyzed by different management disciplines such as financial, organizational or behavioral areas (Cartwright & Schoenberg, 2006). Globally, four main perspectives can be distinguished: (1) financial, (2) organizational behavior, (3) strategic management and (4) M&A process (Nuno, Carvalho & José, 2015). Though the financial perspective is the most represented in M&A literature, it mainly discusses the consequences of M&As on the wealth of merging companies. The strategic management has as purpose to identify strategic factors of merging companies having an impact on the M&A performance, such as the industry relatedness between the merging companies (Cartwright & Schoenberg, 2006). On the other hand, organizational behavior covers the research performed to identify the antecedents and consequences of organizational variables on M&As (Nuno et al., 2015). Lastly, the M&A process perspective discusses the impact of the process on the outcome of the deal. According to Haspeslagh & Jemison (1991) analyzing the M&A process is crucial to grasp the drivers behind M&A success. The process plays an important role in extracting the desired value out of the deal (Sitkin & Jemison, 1986). Moreover, many transactions are led to failure due to a poor handling of the M&A process (Jameson, 1990). This paper is, therefore, exclusively focusing on this specific aspect of mergers and acquisition.

First we will explain the different phases of the M&A process; pre- and post-acquisition stage. Following this we will take a closer look by further developing the pre-acquisition stage. Afterwards a short review about the differences and similitudes between private and public targets in the M&A process will be discussed.

1.1 Pre-and post-acquisition stage

Based on the prior literature (Lasserre, 2003; Haspeslagh & Jemison, 1991; Jemison & Sitkin, 1986) the M&A process mainly consists of two stages: the pre- and the post-acquisition stage. The first phase (i.e. pre-acquisition stage) covers value creation, target selection, and due diligence & valuation. It, thus, takes care of screening the market, evaluating the organizational and strategic fit, and gathering information to assess the target. The second phase (i.e. post-acquisition stage) discusses the integration

between the two companies and its transition (Lasserre, 2003). The pre- and post-acquisition phase can thus respectively be seen as the decision-making and integration phase (Haspeslagh & Jemison, 1991). Until today, the M&A process literature mostly covered the post-acquisition phase, and it mainly emphasizes the post M&A performance: synergies, integration and stock price effects (Luypaert & De Maeseneire, 2015). Though the post-acquisition phase is still worth investigating, further research is more desirable in the pre-acquisition phase, as the literature is scarcer.

The pre-acquisition or decision-making stage can be further divided into two sub-phases: private takeover and public takeover processes (Boone & Mulherin, 2007; Dikova et al., 2010). Private takeover is the phase prior to the public announcement of the M&A; “[it] begins when a selling firm hires an investment banker and considers the number of potential bidders to contact” (Boone & Mulherin, 2007, p.849). The bidders have to sign a confidential agreement in order to receive additional information about the selling company. Afterwards only one bidder makes its offer public. This event marks the beginning of the second sub-phase, namely the public takeover process. During this period, the acquirer receives additional information, evaluates the M&A’s synergies and risks and negotiates the deal terms (Ferreira et al., 2017). This sub-phase ends with deal completion. The time period of the public takeover sub-phase is called deal duration. The representation of the different phases in the pre-acquisition stage is represented in the figure 1 hereunder. The public takeover process is the center of interest for our investigation.

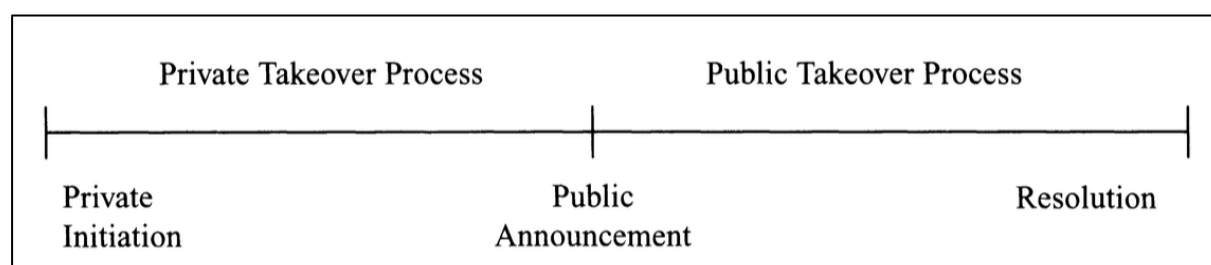


Figure 1: Representation of the pre-acquisition stage (Boone & Mulherin, 2007)

1.2 Second sub-phase of the pre-acquisition stage: Public takeover phase

The public takeover phase, the second sub-phase of the pre-acquisition stage, can have two outcomes: abandonment or success. Those two outcomes will be discussed here below.

Knowing which factors influence deal failure as well as deal duration (applicable when M&A is completed) can help companies in multiple ways (cost, speed, etc.). In fact academics have already started to investigate these two fields. However, while several papers looked into factors affecting deal abandonment the literature discussing deal duration is more limited.

1.2.1 Deal abandonment

Bringing an M&A deal to completion is a complex process. According to the literature the likelihood of deal abandonment in the pre-acquisition phase varies from 14 (Pickering, 1978) to 25 percent (Holl & Kyriazis, 1996). To gain a better understanding, several studies have been performed to identify and investigate the factors influencing M&A abandonment in the public takeover process. These factors can be divided in three categories: firm specific, transaction specific, and institutional & regulatory.

I. Firm specific factors

In this category two important factors can be distinguished: prior M&A experience and pre-performance. Experienced acquirers are more likely to complete a deal. The explanation is that acquirers can transfer & share their knowledge of ulterior transactions (Barkema & Schijven, 2008). It can thus help to be more efficient, for example regarding the administrative workload (Lubatkin, 1983). This finding, however, has to be nuanced because contradictive proof exists. It has been demonstrated that inexperienced acquirers are as successful in completing M&As as experienced ones (Muehlfeld, Sahib & Van Witteloostuijn, 2012).

For the second factor, pre-performance before public announcement, there is no global consensus either. Numerous studies have reached contradicting results for both the targets' and acquirers' pre-performance. In regards to targets, several academics discovered that poorly performing targets are more likely to be successfully acquired (Franks & Mayer, 1996; Asquith, 1983; Holl & Pickering, 1988). However, Kummer and

Hoffmeiser's study (1978) led to the opposite conclusion. Furthermore, several academics were not able to confirm either of these two findings due to insignificance (O'Sullivan & Wong, 1999; Sudarsanam, 1995, Limmack, 1991; Taffler & Holl, 1991). Concerning acquirers' performance, two main factions can also be distinguished (Holl & Pickering, 1988; Taffler & Holl, 1991¹).

II. Transaction specific factors

The second category of determinants influencing merger abandonment relates to transaction-specific factors. They (deal attitude, payment method...) tend to have a more important impact on deal abandonment than firm specific factors (experience, country companies, etc.) (Muehlfeld et al., 2012).

According to O'Sullivan & Wong (2001) one of the prominent reasons why deals are abandoned is due to the resistance of the target management. Between 1989 and 1993, 46% of the deals facing resistance of the target management were abandoned. In contrast, this figure only reached 6% for friendly M&As. This tendency was also observed and validated by several other studies (Holl & Kyriazis, 1997; O'Sullivan & Wong, 1999, Sudarsaman, 1995; Hoffmeister & Dyl, 1981). Moreover, resistance of the target management is even more impactful on deal abandonment when the deal is paid in equity (Sudarsaman, 1995). In general, unrelated to the target resistance, M&As paid by cash are more likely to be completed (Muehlfeld et al., 2012; Dikova et al., 2010).

Various studies have also focused on the bid premium paid by the acquirer. On the one hand a part of academicians have proven that higher bid premium raises M&A success (Walkling, 1985; Holl & Kyriazis, 1996). Others, on the other hand, could not find a significant link between M&A abandonment and lower bid premium (Hayes & Taussig, 1967; Hoffmeister & Dyl, 1981; Sudarsaman, 1995).

Other transaction specific factors investigated were the contested bids, the merger sector, and the merger type (diversified, horizontal, vertical). The former turned out to

¹ This paper also investigated the performance relative to the two companies. They found out for abandoned deals that acquirers' financial health is weaker than the targets' financial health.

be significant for deal abandonment while the two latter had no influence (Pickering, 1978).

III. Institutional and regulatory factors

The institutional impact in the merging companies' countries has been investigated as well. Institutional differences between the countries of the merging companies can significantly influence the likelihood of deal completion (Dikova et al., 2010). Zhang, Zgou & Ebbers (2011) later confirmed this finding while analyzing Chinese cross-border acquisitions. Besides this both papers (Dikova et al., 2010; Zhang et al., 2011) discovered that the institutional difference between the companies' countries moderated the prior M&A experience.

Concerning regulation, it appeared to be a key determinant for deal abandonment. In the newspaper industry (1981-2000) M&As subjected to regulation were more likely to be abandoned (Muehlfeld et al., 2012).

1.2.2 Deal success

Completed M&As does not signify that merging companies go through a smooth public takeover process. M&As can still be characterized by long deal duration. Knowing which factors influence this time period can help companies to minimize it. Moreover, Dikova et al. (2010) and Ferreira et al. (2017) suggested further research in deal duration to gain more insights in the pre M&A negotiation process.

Preventing a long public takeover process can have plenty of benefits for the companies involved. Globally three main reasons can be distinguished. Firstly, delays in M&A completion can result in rising expenditures (Luypaert & De Maeseneire, 2015; Ferreira et al., 2017). Direct costs like negotiation or advising will keep increasing due to the longer time to completion. They can even increase to a point where they could not be offset by the post-M&A performance (Hwang & Roh, 2014). Secondly, merger delays implicate a loss of focus. This could cause the company to miss out on business opportunities (Luypaert & De Maeseneire, 2015; Dikova et al., 2010; Ferreira et al., 2017) and be less attentive to disruptive changes in their environment. Furthermore the company's R&D expenditures tend to decrease during acquisition activities (Hitt, Hoskisson & Ireland, 1990). This could thus result in the company lagging behind the

competition after the deal resolution. Lastly, the competition and stakeholders can benefit from respectively long and short duration time (Luypaert & De Maeseneire, 2015). Bhagwat, Dam & Hartford (2016) demonstrated that longer time to completion were responsible for an increase in merger uncertainty. Competition can take advantage of the uncertainty faced by the merging companies' customers and suppliers to attract them. Moreover, long deal duration gives more time to competitors to make a counteroffer (Luypaert & De Maeseneire, 2015). Investors, on the contrary, can enjoy from faster completion by having the benefits (synergies, market power, etc.) flowing out of the M&A transaction quicker.

Overall, the literature concerning deal duration merely focused on identifying & investigating antecedents of deal duration. The same factor categories (firm specific, transaction specific, institutional & regulatory) can be distinguished as in deal abandonment. The literature is, however, not as abundant.

I. Firm & transaction specific factors

According to Luypaert & De Maeseneire (2015) several firm and transaction specific determinants (namely: deal complexity, disagreement between management & shareholders, likelihood of overpaying, and M&A experience)² tend to significantly influence the deal duration.

A further study on M&A experience (Hwang & Roh, 2014) found out that intra-industry experience speeds up the deal duration. Moreover, Ferreira et al. (2017) came to the same conclusion for acquiring firms having previous M&A experience in a country (in this case Brazil).

II. Institutional and regulatory factors

It has been demonstrated that regulation leads to longer time to completion (Ekelund et al., 2001). Other academics also validated this finding: (1) Yang & Pickford (2016) by analyzing factors affecting the duration of merger reviews in New Zealand and (2)

² It is, however, not the case for information symmetry & bidding competition (Luypaert & De Maeseneire, 2015).

Tingley, Chilton & Milner (2015) by investigating the impact of regulation on Chinese cross-border acquisition.

Regarding institutional factors, Dikova et al. (2010) reached similar findings as for deal abandonment. In other words institutional differences significantly influence time to completion. In addition to this Ferreira et al. (2017) proofed that institutional & technological complexities were significant for deal duration as well.

1.3 Further research

Several suggestions for further research were made: reasons why information asymmetry & bidding contest does not significantly influence deal duration, difference in antecedents between private & public targets, or between domestic & cross-border acquisitions, etc. (Luypaert & De Maeseneire, 2015).

1.4 Public versus Private target

There exists research about private and public targets in the M&A process, but it is rather limited. Academics have mostly investigated the acquirer post-performance depending on the public/private status of the target. Evidence has been found that acquiring private targets delivers better returns in the short term (after the merger announcement) (Capron & Shen, 2007; Conn, Cosh, Guest & Hughes, 2005; Jung, 2010) as well as in the long term (three years after the merger completion) (Conn et al., 2005). Three reasons explaining the difference in performance between private and public targets can be underlined: “(1) improved due diligence and monitoring by target shareholders; (2) lack of hubris effects in the bid process; and (3), the presence of the private company discount in the relatively illiquid market”(Conn et al., 2005, p.38). However, choosing a private target rather than a public target does not always lead to the best performance. Better acquisitions’ decisions are made when the selection theory is taken into consideration (Capron & Shen, 2007). This consists of selecting the target depending on the conditions faced by the acquirer. A private company is for example preferred when the acquirer has limited knowledge about the target’s industry.

Until now, the impact of the public/private status on deal duration has escaped the attention of academics. The literature is merely focusing on public targets (Luypaert & De Maeseneire, 2015; Ekelund et al., 2001). This distinction is, however, important as

the determinants might differ between public and private targets. Furthermore more than 60 percent of M&As involves the acquisition of a private target (Capron & Shen, 2007; Moeller, Schlingemann & Stulz, 2003; Faccio, McConnell & Stolin, 2006). Having a better understanding of the similitudes and differences in determinants of deal duration between private and public targets is thus important. It will help merging companies to adapt their M&A process strategy depending on the public status, and hence minimizing deal duration and its paired costs.

Based on previous literature and academics' remarks for further research, this paper will further analyze the determinants of deal duration in terms of public and private target. In others words, the purpose of this paper is to analyze differences and similitudes in determinants of deal completion between private & public targets. It will thus further build on the work of Luypaert & De Maeseneire.

2 Methodology

First we will define the relevant determinants in term of our study. Moreover we will discuss each of the chosen determinants in more detail and more importantly explain how we will measure them in our investigation. Based on this the hypotheses will be formulated. Secondly we will explain the data and how we defined the sample. Finally, we will discuss the method performed to test the different hypotheses.

2.1 Relevant determinants

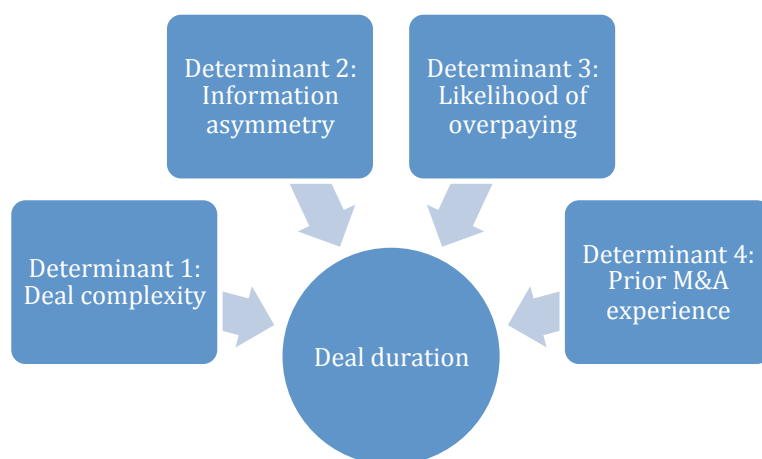
By reviewing the literature of deal abandonment and duration, we can see that the main determinants investigated are prior M&A experience, pre-performance, bid premium, disagreement between management & shareholders, information asymmetry, bidding competition, and deal complexity (including among others: target management resistance, contested bid or payment method). Institutional differences and regulation were also investigated with the aforementioned determinants.

To select the determinants for which their impact on deal duration has to be investigated, three selection criteria were used. First the determinant has to be relevant for both entities, namely private and public. Disagreement between management & shareholders, is, therefore, excluded, as these two parties are the same for private entities. The same is done with pre-performance of the merging companies because it is calculated by using the stock price. However, private entities do not trade on the stock market. Second, the data related to the determinants has to be available on databases. Bidding competition of private targets is eliminated for this reason. Third only factors that are relevant to our sample are selected. As this study focuses on acquirers and targets out of the United States there is no relevance to investigate institutional differences.

Applying these three selection criteria delivers us four determinants, which their impact on deal duration has to be investigated (see fig. 2 hereunder):

- Deal complexity
- Information asymmetry
- Likelihood of overpaying
- Prior M&A experience

In the following paragraphs the definition, the proxies and the hypotheses of the four determinants are discussed further.



Figurer 2: Effect of the determinants being investigated on deal duration

2.1.1 Deal complexity

2.1.1.1 Previous literature

The higher the complexity of a deal, the more time the acquiring company needs to fulfil the transaction. In the past literature this determinant has been defined in several ways. Luypaert & De Maeseneire (2015) used four different variables to represent it, which are: the payment method, the tender vs. merger offer, the deal attitude and the monetary size of the transaction. Undervalued acquirers tend to prefer cash offers while overvalued acquirers have a preference for stock payment (Brown & Ryngaert, 1991). Paying M&A with equity can considerably increase the administrative workload (Luypaert & De Maeseneire, 2015). Moreover stock price can heavily fluctuate during the public takeover process causing high uncertainty with regards to the deal value. This uncertainty can then lead to delays or even abandonment (Dikova et al., 2010). A merger offer tends to lead to a similar outcome as a stock payment. Compared to a tender, such offer takes at least 35 additional days (Offenberg & Pirinsky, 2016). This is because it faces a more complex process. The company has to call for a shareholder meeting to approve the merger. In addition to this, the deal financing is performed before the

announcement while for merger offers it can take several months following the announcement (Offenberg & Pirinsky, 2016). Regarding the money involved in the transaction it tends to complicate the deal completion (Hwang & Roh, 2014). Larger deals make the M&A process more complex as there might be several business units to take into consideration (Ekelund et al., 2001).

A well-made offer is, however, as important as a friendly relationship with the target company. As mentioned in the literature review, resistance of the target management is a key determinant of deal abandonment. It can slow an efficient collaboration between the two merging companies, consequently raising the deal complexity.

Other determinants that can (partially) reflect deal complexity are regulation and relative size. According to Ekelund et al. (2001) M&As in regulated industries take significantly more time due to the merger review(s) (94 days in unregulated industries vs. 169 in regulated industries). Low relative size of the target compared to the acquirer, on the other side, is assumed to ease the public takeover process (Hwang & Roh, 2014). The variable can be interpreted as the bargaining power of the target company (Kapoor & Lim, 2007). In case of small relative size of the target, there is a power imbalance in favour of the acquirer. This situation might allow the acquirer to drive his decisions. Moreover, the integration comprises fewer challenges (Haspeslagh & Jemison, 1991).

2.1.1.2 Proxies

Out of the proxies discussed in the previous paragraph, four were selected. First there is the deal value. This variable is defined by the natural logarithm of the deal size. The logarithm was taken because the residuals have a skewed distribution. The second proxy is the payment method. In our study we focus on three different payment methods: cash, stock, and cash & stock. Other consideration methods (debt, preferred stock, etc.) were disbarred because the market value is often undisclosed (Jetley & Ji, 2010). A dummy represents this variable: 0 is for cash payment, 1 for stock or stock & cash payment. Third, there is the relative size of the target compared to the acquirer. To define this proxy different ways exist (employees, total sales, total assets, etc.). In our model the variable is calculated by dividing the total deal value by the acquirer market capitalization one month before the merger public announcement. According to Jansen,

Sanning & Stuart (2013), it is one of the most recurrent definitions. The fourth and last proxy is regulation. The number of regulatory agencies scrutinizing the transaction represents this variable.

Other proxies were not selected due to two reasons: (1) not applicable to private entities (tender/merger) and (2) limited data (deal attitude).

2.1.1.3 Hypotheses

We hypothesize that deal complexity has an influence on deal duration of private acquisitions as well as public acquisitions. Although complexity might be faced in every type of transaction we assume it has a different impact on the public takeover process depending on the public type of the target (public/private). Public takeovers often involve more money. In the case of Draper & Paudyal (2006), the deal value was 12 times bigger. Other academics also validated this significant difference (Capron & Shen, 2007; Chang, 1998; Fuller, Netter & Stegemoller, 2002). Furthermore, higher deal values imply a higher relative size of the target; this results in a better power balance between the two parties, but could, on the other hand, complicate the negotiation process. In addition to this, M&As between public entities tend to be closely scrutinized, as they face higher regulatory rules.

The hypotheses concerning deal complexity are thus the following:

H_{1A}: Deal complexity positively influences the deal duration of M&As purchasing a private company

H_{1B}: Deal complexity positively influences the deal duration of M&As purchasing a public company

H_{1C}: Deal complexity has a more important impact on the deal duration of M&As purchasing a public company

2.1.2 Information asymmetry

2.1.2.1 Previous literature

When one of the two parties holds more information than what he is disclosing, the due diligence process faces additional difficulties (Luypaert & De Maeseneire 2015). This can, for example, lead to renegotiation of deal terms during the public takeover process. The proxies for information asymmetry are hard to define because it is difficult to observe. There exists, however, several proxies in literature. For example, financial analysts help minimize information asymmetry (Luypaert & De Maeseneire, 2015) by playing an advisory role during the entirety of the M&A process. Furthermore, they provide support by gathering information related to the counter-party. The distance between the headquarters of the merging entities is another proxy. Larger distances complicate the sharing of information (Basu & Chevrier, 2011; Ragozzino & Reuer, 2011). While financial data can be easily accessed through databases and reports, intangible information (such as internal issues) is harder to observe. This is especially the case for acquirers located far from the target as misinterpretation & poor transmission might play a greater role (Ciobanu, 2016). Relatedness of the companies' industries can also reflect information asymmetry. It is assumed that the distortion of information is less important when the merging companies are operating in the same industry (Luypaert & De Maeseneire, 2015). The acquirer retains a better knowledge on the sector practices, allowing him to gain time in negotiation. Other proxies include the blockholders or, in other words, the companies/individuals having a shareholder stake of at least 5 percent in the target firm (Heflin & Shaw, 2000). The blockholders benefit from an easier access to the target management and, consequently, to undisclosed information (Heflin & Shaw, 2000; Brockman & Xuemin, 2009; Kang & Kim, 2008; Edmans, 2009). Additional proxies worth mentioning are: stock or cash flow volatility (Zhang et al., 2011) and age (Henderson, 1999; Sanders & Boivie, 2004).

2.1.2.2 Proxies

Three of the proxies explained here above were introduced in our model. The number of advisors working on the deal defines the value of the financial advisors variable. This is done separately for the target and acquirer advisors. The second variable, the distance, is represented by the air distance between the headquarters of the two merging

companies. Lastly, the relatedness of the merging companies is defined by a dummy variable. The M&A is considered sector-related when both companies have the same first two digits of the SIC-code. The value of 1 is then assigned. Diversified M&As receive the value of 0.

Regarding the other proxies, they were not introduced for the same reasons mentioned in deal complexity (see § 2.1.1.2 Proxies).

2.1.2.3 Hypotheses

We assume that deal duration of public and private targets are affected by information asymmetry. However, information asymmetry tends to be more linked to the acquisition of private targets. Since private entities are not listed, they only disclose limited information about the company. Public companies, in contrast, share more information to satisfy their shareholders and to comply with the stricter regulation. On the other hand, acquiring a private target results in a higher uncertainty for the acquirer. Moreover, he cannot become a blockholder in the target company to gain insight information.

This reasoning thus leads to the following three hypotheses:

H_{2A}: Information asymmetry positively influences the deal duration of M&As purchasing a private company

H_{2B}: Information asymmetry positively influences the deal duration of M&As purchasing a public company

H_{2C}: Information asymmetry has a more important impact on the deal duration of M&As purchasing a private company

2.1.3 Likelihood of overpaying

2.1.3.1 Previous literature

In M&A transactions the acquirer sometimes tends to overpay. Paying a premium improves the target's perception of the acquirer. This can result in a smoother public takeover process consequently, shortening the deal duration. Growing companies detaining a high volume of cash tend to overpay for a target (Abhyankara, Hob & Zhao, 2005). Luypaert & De Maeseneire (2015), therefore, assumed that acquirer cash and market-to-book ratio negatively influence time to completion. Besides this, they also used the target cumulative abnormal returns around the public announcement as a proxy for overpayment. Another variable is the CEO overconfidence. Presumptuous acquirer CEOs tend to overestimate their skills to create value. Moreover the bid premium is even stronger when both companies' management are overconfident (Kose, Liu & Taffler, 2011). Other proxies are earnings-price ratio (Han, Suk & Sung, 1998) or equity-based compensation (Datta, Iskandar-Datta & Raman, 2001).

2.1.3.2 Proxies

To represent the likelihood of overpayment, two proxies are used. On the one hand, there is the acquirer's cash defined as the acquirer's total cash (last time reported prior the M&A announcement) divided by its total assets (value over the last 12 months prior the M&A announcement) (Luypaert & De Maeseneire, 2015). On the other hand, there is the market-to-book ratio calculated by the stock price (price one month before the M&A announcement) divided by the book value per share (latest time reported prior the M&A announcement). Other proxies were not applicable due to the limited data (CEO overconfidence, earnings-price ratio) or the irrelevance for private entities (target abnormal returns, equity-based compensation).

2.1.3.3 Hypotheses

We assume that public as well as private targets are affected by the likelihood of overpayment. For private entities we, however, assume that the acquirer cannot base their M&A offers on the stock market for private entities. This limitation complicates the valuation of the target. Furthermore the assumed greater information asymmetry can hide internal weaknesses of the target.

The hypotheses concerning the deal complexity are thus the following:

H_{3A}: The likelihood of overpaying negatively influences the deal duration of M&As purchasing a private company

H_{3B}: The likelihood of overpaying negatively influences the deal duration of M&As purchasing a public company

H_{3C}: The likelihood of overpaying has a more important impact on the deal duration of M&As purchasing a private company

2.1.4 Prior M&A experience

2.1.4.1 Previous literature

As mentioned in the literature study, M&A experience can play a role in the deal duration (see § 1.2.2 Deal success). In general this factor can be reflected in various ways. First, there is the number of completed deals prior the M&A announcement. The acquirer tends to be faster at completing deals as he executed more of them in the past (Luypaert & De Maeseneire, 2015). This can be because "... firms develop routines in terms of adherence to diverse competition laws, provision of consistent messages to all stakeholders, development of effective communication strategies, planning the integration and transformation of the merging firms in one new entity, ..." (Dikova, 2010, p.229). Second the proxy can stand for the number of M&As executed in the target's industry prior the M&A announcement. According to a group of academics, this is a more relevant proxy, as experience acquired in unrelated sectors does not deliver the expertise necessary to be successful in M&As in other industries (Vermeulen & Barkema, 2001; Hayward, 2002). Experience gained from M&A in other industries can thus lead to wrong decisions. Lastly prior M&A experience can be investigated by looking at the inter- and intra-acquisition experience separately (Hwang & Roh, 2014). In others words a distinction is made between M&As performed in the core industry of the acquirer and the ones outside of it.

2.1.4.2 Proxies

For this factor, two proxies will be used in our model. The first proxy is the prior general M&A experience, defined as the number of completed deals prior the M&A announcement. The second proxy is the prior target industry M&A experience. It is calculated by the number of M&As executed in the target's industry prior the M&A announcement. It is, however, important to mention that only the M&As in the sample period were taken into consideration when calculating the value of the two proxies.

2.1.4.3 Hypotheses

Prior M&A experience can reduce the deal duration when a public company acquires a public or private company. Furthermore acquirers with limited experience tend to opt for public targets (Capron & Shen, 2007). Therefore, we assume that prior M&A experience plays a more important role in M&As involving the purchase of private companies.

The hypotheses concerning prior M&A experience are thus the following:

H_{4A}: Prior M&A experience negatively influences the deal duration of M&As purchasing a private company

H_{4B}: Prior M&A experience negatively influences the deal duration of M&As purchasing a public company

H_{4C}: Prior M&A experience has a more important impact on the deal duration of M&As purchasing a private company

In the table 1 hereunder a global summary is given of each determinant with its proxies.

Determinants	Proxies	Operationalization
Deal complexity	Deal value	Natural logarithm of deal value
	Payment method	0 for cash transactions; 1 for stock or stock & cash transactions
	Relative size	Deal value divided by the acquirer market value
	Regulation	Number of regulatory agencies scrutinizing the deal
Information asymmetry	Target financial advisors	Number of financial advisors enlisted by the target company
	Acquirer financial advisors	Numbers of financial advisors enlisted by the acquirer company
	Distance	Distance between the headquarters of the two merging companies
	Related industry	0 for companies in diversified industry; 1 for company in the same industry (2 first digits of the SIC-code of both companies are identical)
Likelihood of overpaying	Acquirer cash	Acquirer cash divided by the total assets
	Acquirer market-to-book	Acquirer market value divided by the acquirer book value
Prior M&A experience	General experience	Number of completed M&As performed prior the transaction during the sample period
	Target industry experience	Number of completed M&As performed in the target industry (identified by the 2 first digits of the SIC-code) prior the transaction during the sample period

Table 1: Summary of the proxies reflecting the determinants

2.2 Data and sample

To verify our hypotheses data was retrieved from Thomson Banker One. This database contains financial and market data about more than 38.000 companies. Furthermore it has one of the most extensive collections of M&As, consisting of more than 300.000 U.S M&As since 1977 (Thomson Reuters, 2017).

From this database we extracted all the completed M&As involving a US public acquirer and a US target between 1994 and 2011. Afterwards further selection criteria were applied on the data. First merging companies active in the financial sector (SIC-code starting with 6) were excluded because they are subjected to other accounting practices (Heron & Lie, 2002). Second only majority takeover M&As were taken into consideration. Two requirements have to be fulfilled to consider a transaction as such: (1) the acquirer has to detain more than 50% of the ownership after deal completion, (2) the acquirer cannot detain more than 50% of the company before the transaction.

Lastly, certain firm and transaction characteristics³ of the M&A are required to be available on the database.

By applying these selection criteria a sample of 6065 transactions is obtained. The majority of the transactions (3945 to be exact) involve the acquisitions of private entities. The public takeovers, in contrast, only represent 35% of the total sample. However, this is not a surprising fact as private acquisitions globally stand for 60 to 75% of all the M&As transactions (Capron & Shen, 2007). Regarding the sample deal duration it widely differs from the literature because its mean is 67 days. Ulterior papers, on the contrary, reached higher values. Luypaert & De Maeseneire (2015) calculated a time to completion of 112 days (median: 93 days). Ekelund et al. (2001) obtained similar results, namely 94 days. The reason for such a difference is due to the inclusion of private acquisitions in our sample. In the past literature studies were mainly conducted on public targets exclusively. When only the acquisition of public targets is taken into consideration, the deal duration lasts 119 days on average (median: 97 days). The time to completion observed is thus consistent with the prior literature. Regarding the deal duration of private targets it is significantly lower. To be more precise it takes on average 39 days to acquire a private entity (median of 17 days).

From 1994 to 2011 certain deals were never brought to completion. By applying the same selection procedure as the one on completed deals a number of 508 abandoned deals was obtained. Proportionally to the total sample (abandoned & successful M&As) this is approximately 8.4%. This figure appeared to be quite low compared to the past literature. Like previously mentioned 14% to 25% of deals are abandoned during the M&A process (see § 1.2.1. Deal abandonment). As most of the literature based their studies exclusively on public targets a distinction between private and public targets is relevant. Calculating the representation of public target abandoned deals to all the deals involving the acquisition of a public entity leads to a percentage of 15.9%. This figure is aligned with previous papers. Concerning private targets the number of deal

³ These characteristics are the following: deal attitude, acquirer's total assets, acquirer's cash, acquirer's book value per share & price, and companies' addresses.

abandonment only reached 2.7%. A potential justification for this low number is the lack of reporting of failed attempts.

By looking at the behaviour of the proxies in the sample of completed M&As, several trends can already be distinguished. First all the proxies reflecting deal complexity appear to influence the time to completion (see Appendix 1). This observation is valid for private targets as well as public targets. Small transaction in less regulated industry involving cash payment & small relative size compared to the acquirer tends to speed up the public takeover process. Concerning information asymmetry (see Appendix 2) the proxies seemed to influence the M&A process, but the proxies are counter-intuitive. Targets located further from the acquirer (in a related industry)⁴ appear to take more time than close targets in unfamiliar sector. Furthermore financial advisors enlisted by the target or acquirer tend to cause a longer process. Regarding the likelihood of overpaying reflected by the acquirer's cash appears to decrease deal duration. However, too much cash causes the time to completion to increase again (see Appendix 3). The other proxy, market-to-book value, does not look to influence the public takeover process. Concerning the last determinant M&A experience (see Appendix 4) both of the proxies show a negative relationship with deal duration.

A description of the explanatory variables of the sample of completed deals was performed to control for multicollinearity issues (see Appendix 5). The pairwise correlations were all below the cut-threshold of 0.7 (Capron & Shen, 2007) except for the global and intra-industry M&A experience that was 0.86. To solve this correlation issue three different models were created: (1) model 1 with the interaction of the prior M&A proxies, (2) model 2 only with the prior general M&A experience proxy, (3) model 3 only with the prior target industry M&A experience proxy. Besides the correlation control the variance inflation factor was computed as well. All of them were below 5. They are thus under the cut-off level of 10 (Dikova et al., 2011).

These two control tests were also performed for public and private targets separately (see respectively appendix 6 and 7). The same conclusions can be drawn.

⁴ This is only valid for public targets.

2.3 Method

To test the hypotheses, the determinants affecting deal duration of private and public targets were first investigated independently. It was performed by executing three different statistical models: (1) the Poisson Count regression, (2) the OLS regression and (3) the two-step Heckman model. These models were also used in past literature (Luybaert & De Maeseneire, 2015; Muehlfeld et al., 2012; Hwang & Roh, 2014).

In the first phase, the two regressions were applied on the sample of completed M&As. The dependant variable is equal to the deal duration or, in other words, the number of days between the public announcement of the M&A and the deal completion. The twelve proxies mentioned in last section are introduced into the regressions as independent variables. In addition to this a year dummy was added to the model to reflect yearly changes such as the macroeconomic environment or changes in M&As procedure. The regression would look like the following if it would be model 1 (the model with the interaction of both M&A experience proxies):

$$\text{Deal duration} = \beta_0 + \beta_1(\text{Deal value}) + \beta_2(\text{Payment method}) + \beta_3(\text{Relative size}) + \beta_4(\text{All-cash deal}) + \beta_5(\text{Regulation}) + \beta_6(\text{Acquirer financial advisors}) + \beta_7(\text{Target financial advisors}) + \beta_8(\text{Distance}) + \beta_9(\text{Related industry}) + \beta_{10}(\text{Acquirer market-to-book ratio}) + \beta_{11}(\text{Acquirer cash}) + \beta_{12}(\text{General M\&A experience}) * \beta_{13}(\text{Target industry M\&A experience}) + \beta_{14}(\text{Year dummy}) + \varepsilon$$

In the second phase the two-step Heckman model is applied on the sample. The purpose of this test is to correct for selection bias. In our sample we only consider deal duration of completed deals. Abandoned deals are not taken into consideration, as the date of completion is inexistent. It is thus important to control if there were unobservable components influencing the deal completion as well as the deal duration. The Inverse Mills Ratio reflects the selection bias. If it is significant it implies that there is a correlation between the unobservable components of the deal completion and deal duration. Thanks to this model we are able to remove this selection bias (if it exists) from the sample. In the first step of the Heckman approach the deal completion is thus the dependent variable and we take all the deals in consideration (abandoned and completed). In the second step the deal duration is the dependent variable and the

sample only consists of the completed deals. All the proxies as well as the year dummy are inserted in both steps of the model.

After investigating the determinants affecting deal duration of private and public targets independently, a new two-step Heckman test is applied but this time on the whole sample (public & private targets). The goal is to verify the hypotheses regarding the differences/similitudes in impact on deal duration of the determinants between public and private targets. For this Heckman test all the independent variables and the year dummy are computed as well in the both steps. Regarding the public status variable (moderator variable) it is only inserted in the second step of the model because it is considered to not affect deal completion in the first step. Moreover we add the interaction between the public targets and the investigated proxy. This will enable us to control for significant differences between private and public targets. If the interaction turns out to be significant we can conclude that there is a distinction between private and public targets. This new two-step Heckman test is repeated for every investigated proxy.

3 Results

This chapter will discuss the results. It is divided in three sections: results regarding the private targets, results regarding the public targets, and results regarding the comparison of private with public targets.

3.1 Private targets

We will first perform statistical tests on the sample of private completed deals. It will allow us to see which variables influence deal duration and which ones do not. Based on those results, we will test the four hypotheses. It is important to note that we only focus on the private industry in this section.

3.1.1 Testing the models

In the table 2 hereunder an overview is given of the Poisson Count and the OLS regressions on the sample of private targets. These regressions were performed on the three models specified in last section: (1) model 1 with the interaction of both M&A experience proxies, (2) model 2 only with the general M&A experience proxy, (3) model 3 only with the target industry M&A experience proxy. Five of the explanatory variables turn out to be significant across the six statistical tests.

Looking further at the significant proxies the ones reflecting deal complexity are by far the most represented. The payment consideration tends to speed up the deal process when the acquisition is fully paid in cash. In contrast, large transactions under high regulatory scrutiny take longer time to fulfil. Concerning information asymmetry the acquirer's analysts positively influence time to completion. It, thus, contradicts our expectation: the more advisors involve in the transaction the longer the deal duration. The last significant proxy is the acquirer's cash reflecting the likelihood of overpaying. As you can see in the table it is negatively related with deal duration.

Concerning the determinants reflecting prior M&A experience only the interaction between general and target's industry experience shows a sign of significance in Model 1. Moreover it is positively related with time to completion. The insignificance of the general experience is contradictory with the findings of Muehlfeld et al. (2012). The reason for this difference lays in the definition of prior M&A experience. In their paper they define it as a dummy variable: 1 for companies having prior M&A experience and 0

for first timers. By using the operational definition of Muehlfeld et al. (2012) on our prior M&A experience proxies⁵ more logical results were obtained (see Appendix 8). The general M&A experience is now negatively significant. This is also the case for target's industry prior M&A experience.

	Expected sign	MODEL 1		MODEL 2		MODEL 3	
		Poisson Count	OLS	Poisson Count	OLS	Poisson Count	OLS
Coefficient		2.7025***	42.276*	2.8035***	45.998**	2.8079***	45.888**
Hypothesis 1: Deal complexity							
Stock, mix stock & cash	+	0.56862***	20.949***	0.57176***	21.182***	0.57158***	21.159***
Regulation	+	0.37041***	20.158***	0.37419***	20.235***	0.37398***	20.224***
Relative Size	+	0.00077451	0.037144	0.0008502	0.040465	0.00085584	0.040673
Deal Value	+	0.070575***	2.4695***	0.06478***	2.2476***	0.06433***	2.246***
Hypothesis 2: Information asymmetry							
Related industry	-	-0.042696	-1.153	-0.064351	-2.2186	-0.060215	-1.9799
Distance	+	-0.000022	-0.0008472	-0.0000242	-0.000936	-0.0000240	-0.000920
Acquirer's advisors	-	0.25733***	13.286***	0.26515***	13.629***	0.266***	13.638***
Target's advisors	-	-0.026502	0.014802	-0.026338	-0.093818	-0.02599	-0.089391
Hypothesis 3: Likelihood of overpaying							
Acquirer's cash	-	-0.29324**	-12.931***	-0.26496**	-11.857***	-0.26484**	-11.846***
MTB	-	0.00008623	0.0018704	0.00008279	0.001705	0.00008274	0.001714
Hypothesis 4: M&A Experience							
General M&A Experience	-	-0.011888	-0.40375*	-0.002267	-0.10966	N/A	N/A
Target industry M&A Experience	-	-0.020874	-0.87445*	N/A	N/A	-0.0035488	-0.21061
Interaction experience	+	0.00064 ***	0.02394***				
R-squared		0.11	0.13	0.11	0.13	0.11	0.13

The symbols *, **, *** indicate significance of 10%, 5% and 1% respectively.

Table 2: Poisson Count and OLS regressions performed on the sample of private targets on the three different models

⁵ The regressions were only tested on model 2 and 3. Due to collinearity caused by the newly defined proxies it could not been performed on model 1.

Secondly, the Heckman test was applied on the sample of private acquisitions to control for selection bias. The results can be seen in the table 3 hereunder. The Inverse Mills Ratio is highly significant implying the existence of a selection bias. Most of our previous results regarding covariates' impact OLS estimates remain consistent. One exception worth mentioning is the interaction between general and target's industry prior M&A experience. According to the results stemming from Heckman two-step approach it tends to not influence the deal duration. This finding is, in contrast, with the regressions tests.

		Significant in	MODEL 1		MODEL 2		MODEL 3	
		regressions	1 st step	2 nd step	1 st step	2 nd step	1 st step	2 nd step
Coefficient			3.186***	48.65**	3.209***	51.36**	3.13***	49.76***
Hypothesis 1: Deal complexity								
Stock, mix stock & cash	Yes		-0.6268***	11.92***	-0.6246***	10.15**	-0.6416***	13.65***
Regulation	Yes		0.008738	20.29***	0.007891	20.34***	0.006421	20.32***
Relative Size	No		-0.0004974	0.006797	-0.0004932	0.001787	-0.0007104	0.01364
Deal Value	Yes		-0.06093*	1.733*	-0.06237**	1.493	-0.05414*	1.735**
Hypothesis 2: Information asymmetry								
Related industry	No		0.1523	0.7322	0.1399	0.6939	0.09239	-0.1763
Distance	No		0.00002151	-0.0005062	0.00002084	-0.000467	0.00001883	-0.00064
Acquirer's advisors	Yes		0.1683	15.76***	0.169	16.39***	0.151	15.41***
Target's advisors	No		0.1808*	2.435	0.1834*	2.926	0.2027*	2.034
Hypothesis 3: Likelihood of overpaying								
Acquirer's cash	Yes		0.26	-9.671*	0.2584	-8.654	0.2001	-9.748**
MTB	No		0.00007224	0.003087	0.00007143	0.003279	0.00007847	0.002789
Hypothesis 4: M&A Experience								
General M&A Experience	No		0.1092**	0.06462	0.09943***	0.1966	N/A	N/A
Target industry M&A experience	No		-0.04766	-0.4995	N/A	N/A	0.104***	0.1122
Interaction experience	Yes		0.00495	0.0107				
Inverse Mills Ratio				136.828***		165.101**		110.048**

The symbols *, **, *** indicate significance of 10%, 5% and 1% respectively

Table 3: Two-step Heckman test performed on the sample of private targets on the three different models

The Heckman procedure was also applied on the model with the definition of Muehlfeld et al. (2012) for the proxies of M&A experience (see Appendix 9). It turns out that the Inverse Mills Ratio is insignificant, implicating the sample does not suffer from selection bias. Moreover it validates prior M&A experience as key determinant on deal duration of private acquisitions.

3.1.2 Testing the hypotheses

These results lead to several findings about the factors influencing the deal duration and deliver information to assess our hypotheses regarding private targets.

H_{1A}: Deal complexity positively influences the deal duration of M&As purchasing a private company

As expected the more complex the deal is, the longer the public takeover process lasts. Looking further into the different proxies of deal complexity, we will see that not all of them have a significant effect on deal duration. Transactions involving cash payments tend to be easier to complete. The same conclusion can be drawn for acquisitions under low regulatory scrutiny. Regarding deal value it turns out to complicate the public takeover process. Larger transactions negatively impact the time to completion. The relative size of the target compared to the acquirer has, however, no influence on the time to completion. The power distribution as mentioned by Kapoor & Lim (2007) does not play a role in the negotiations. We can thus say that having a mono-direction during the merger process is not leading to a faster outcome. To the contrary, the acquirer risks creating a hostile climate between the two merging companies. It is important to engage in a dialogue with the target firm.

We can thus conclude that deal complexity has an impact on the deal duration of M&As purchasing a private company. In other words, we cannot reject the hypothesis.

H_{2A}: Information asymmetry positively influences the deal duration of M&As purchasing a private company

Information asymmetry seems to not negatively influence the timing of the public takeover process; the hypothesis 2 is rejected by this analysis. As mentioned before, the information asymmetry is described by four proxies in this model (1) target advisor, (2)

acquirer advisor, (3) related industry and (4) distance. The acquirer analysts tend to have a positive relationship with deal duration. A possible justification is that advisors discover undisclosed information during the process leading to the renegotiation of deal terms. Target advisors, in contrast, do not influence time to completion.

Information asymmetry is, thus, not a key determinant for a longer negotiation process. Potential reasons are that there is an important information exchange between the merging companies. Private acquisitions often involve the signing of confidential agreements, which can lead to a more transparent picture of the company. This prevents the discovery of undisclosed information during the public takeover process, leading to renegotiations.

H_{3A}: The likelihood of overpaying negatively influences the deal duration of M&As purchasing a private company

Overpaying for a private target tends to have a fruitful implication on the deal duration. It namely leads to a shorter time to completion. Target management might cooperate more willingly because they feel like the acquirer perceives the firm at its true value. Moreover they consider the offer as an interesting opportunity to sell the company. They, therefore, want to close the deal as soon as possible. In short, we cannot reject the third hypothesis.

H_{4A}: Prior M&A experience negatively influences the deal duration of M&As purchasing a private company

Concerning the prior M&A experience, two findings can be drawn. First, acquirers do not tend to benefit from strong record of M&As. The quantity of takeovers executed in the past does not influence the deal duration. The second finding is that there is a clear distinction between first-timers and experienced acquirers. We can thus assume that the learning process from prior M&As exists but is limited to a certain extent. Our initial hypothesis is, therefore, assumed to be valid.

3.2 Public targets

We will first perform statistical tests on the model. It will allow us to see which variables influence deal duration and which ones do not. Based on those results, we will test the four hypotheses. It is important to note that we only focus on the public industry in this section.

3.2.1 Testing the models

The results of the Poisson Count and OLS regression can be seen in the table 4 hereunder. Two of the proxies reflecting deal complexity turn out to be significant. Like for the acquisition of private targets M&As in regulated industries tend to lead to high duration time. Furthermore deals paid totally or partially in stock are more difficult to complete. Concerning information asymmetry it seems not to be a key determinant. Two of the proxies show an opposite relationship. Related industry increases the time to completion of the M&A. This is surprising as this signifies that a shorter public takeover process can be achieved outside the acquirer's core industry. Distance also has an unexpected relationship with deal duration: the longer the distance between the headquarters of the companies the faster the deal is brought to completion. It, thus, looks that information asymmetry does not play a role. However, we can remove the negative significance of distance by focusing only on the small sized targets (based on the deal value). The interaction between the proxy distance and the newly added small size companies'⁶ variable is positive and significant (see Appendix 12). This is in line with previous literature (Bick, Crook, Lynch & Walkup, 2017). Regarding the likelihood of overpaying one of the two proxies (i.e. acquirer's cash) is negatively significant with time to completion. Lastly, experienced acquirers of public companies close deals faster. Both of them (general and target industry experience) are negatively significant. Concerning the interaction in-between the proxies it is positively significant.

⁶ The target is defined as small sized when its deal value is in the lowest decile of their announcement year

	Expected sign	MODEL 1		MODEL 2		MODEL 3	
		Poisson Count	OLS	Poisson Count	OLS	Poisson Count	OLS
Coefficient		4.12***	49.9709673	4.1421***	54.44376	4.158***	55.78520
Hypothesis 1: Deal complexity							
Stock, mix stock & cash	+	0.4841***	53.9115367	0.4853***	54.179***	0.48711***	54.23703*
Regulation	+	0.12776***	17.1713695	0.1278***	17.15742*	0.12723***	17.10438*
Relative Size	+	-0.0008963	-0.1118856	-0.0008946	-0.110758	-0.0008355	-0.105962
Deal Value	+	0.019676*	2.2739689	0.018445	2.013405	0.016852	1.884467
Hypothesis 2: Information asymmetry							
Related industry	-	0.088156***	10.8225641	0.086591**	10.51238*	0.10491***	12.28379*
Distance	+	-0.00004***	-0.0041***	-0.00004***	-0.0043***	-0.00004***	-0.0044***
Acquirer's advisors	-	0.024349	2.9246221	0.025823	3.378192	0.0279	3.518713
Target's advisors	-	0.02608	3.159901	0.026268	3.249816	0.026617	3.234429
Hypothesis 3: Likelihood of overpaying							
Acquirer's cash	-	-0.33583***	-41.1011***	-0.32946***	-39.915***	-0.32911***	-39.943***
MTB	-	-0.0002055	-0.0210963	-0.0002160	-0.022203	-0.0002182	-0.022209
Hypothesis 4: M&A Experience							
General M&A experience	-	-0.01767***	-1.87946***	-0.01189***	-0.9928***	N/A	N/A
Target industry M&A experience	-	-0.0052515	-0.7026381	N/A	N/A	-0.01627***	-1.5718***
Interaction experience	+	0.00052137	0.0615791*				
R-squared		0.23	0.19	0.22	0.19	0.22	0.19

The symbols *, **, *** indicate significance of 10%, 5% and 1% respectively

Table 4: Poisson Count and OLS regressions performed on the sample of public targets on the three different models

To control for selection bias the two-step Heckman test was performed on this sample as well (see table 5 hereunder). The Inverse Mills Ratio turns to be significant implying a selection bias in our model. By comparing the regressions and the Heckman model we can see that the significance of a few proxies differs. First the distance variable does not show any significance across the three models. This is surprising as the distance was highly significant in the Poisson Count and OLS regressions. However, if the impact of distance on deal duration is observed depending on the size of the targets the proxy

turns out to be positively significant for small targets (see Appendix 13). This is thus in line with the regressions. Second there is M&A experience. In none of the three models it proves to be significant after correcting for selection bias. This is also the case when the classification of Muehlfeld et al. (2012) is used for the prior M&A experience proxies (see Appendix 11). Lastly, advisors tend to play a role in the deal duration. Both regression types did not, however, identify this.

	Significant in	MODEL 1		MODEL 2		MODEL 3	
	regressions	1 st step	2 nd step	1 st step	2 nd step	1 st step	2 nd step
Coefficient		2.073***	39.798893	2.079***	40.34	1.98***	38.48
Hypothesis 1: Deal complexity							
Stock, mix stock & cash	Yes	-0.07862	49.000706*	-0.08021	48.48***	-0.09095	47.46***
Regulation	Yes	0.2509***	30.397856*	0.2504***	31.52***	0.2527***	33.52***
Relative Size	No	-0.001153	-0.255116	-0.001237	-0.2693	-0.001465	-0.3024
Deal Value	No	-0.1192***	-3.55679	-0.119***	-4.145	-0.1122***	-4.994.
Hypothesis 2: Information asymmetry							
Related industry	Yes	0.1481**	18.303433*	0.1354**	19.16***	0.1058	20.55***
Distance	Yes	0.00005521	0.002615	0.00005574	0.002918	0.00006147	0.003782
Acquirer's advisors	No	0.1728***	10.998503*	0.173***	11.84**	0.1587***	12.99**
Target's advisors	No	0.4082***	23.890387*	0.4074***	25.78***	0.4077***	29.06***
Hypothesis 3: Likelihood of overpaying							
Acquirer's cash	Yes	0.03176	-38.4455***	0.03214	-37.54***	0.02279	-36.63**
MTB	No	0.00226	-0.001286	0.002223	0.000456	0.002274*	0.00407
Hypothesis 4: M&A Experience							
General M&A experience	Yes	0.05153***	0.100804	0.04291***	0.4605	N/A	N/A
Target industry M&A experience	Yes	-0.02471	-0.281014	N/A	N/A	0.04341***	0.8741
Interaction experience	Yes	0.0007294	0.018135				
Inverse Mills Ratio			173.87***		189.44***		215.175**

The symbols *, **, *** indicate significance of 10%, 5% and 1% respectively

Table 5: Two-step Heckman performed on the sample of private targets on the three different models

3.2.2 Testing the hypotheses

These results lead to several findings and able us to assess the hypotheses regarding public targets.

H_{1B}: Deal complexity positively influences the deal duration of M&As purchasing a public company

Acquisitions of public companies are characterized by complexity. By having a closer look at the proxies of deal complexity, we can draw some conclusions. First, M&As paid in cash are completed faster than when payment consideration is totally or partially in stock. Secondly, takeovers in industry under high regulatory scrutiny also positively affect deal duration. The reviews performed by the agencies delay the public takeover process. Unexpectedly the size of the transaction does not seem to affect the merger process. This is contradictory to the finding of Luypaert & De Maeseneire (2015). Thirdly, relative size does not play a role. This shows again the relevance of having a dialogue during the M&A process because a party dictating the whole negotiation creates tension on one hand and is not able to complete the deal faster on the other hand. In general we can, thus, conclude that deal complexity positively influence the deal duration of M&As purchasing a public company. In others word the hypothesis is accepted.

H_{2B}: Information asymmetry positively influences the deal duration of M&As purchasing a public company

Regarding information asymmetry, it does not affect the timing of the transaction. Knowledge from your core industry does not seem to help solve the information gap. In contrast it positively affects the deal duration. This would suggest that companies from the same industry are less informed than companies active in other sectors. This is in contrast with the finding of Luypaert & De Maeseneire (2015). They conclude that whole the companies are on the same level. An explanation for this counter-intuitive finding could be that firms in the same industry tend to argue more about best practices. Both companies have their way of doing things that seems successful. Therefore giving up on it requires a longer negotiation process. In contrast firms from different industries do not have such conflicts. The financial analysts also show a positive relationship with

time to completion. A potential justification is that these advisors discover undisclosed information leading to the renegotiation of deal terms. Regarding distance between the headquarters of the merging companies it tends to not have an impact. It is, however, not the case for small sized targets as they suffer from long distances.

Overall we can thus reject the hypothesis and conclude that information asymmetry does not have a significant impact on deal duration. It is thus in line with Luypaert & De Maeseneire (2015). However, this statement is not valid for small-sized targets.

H_{3B}: The likelihood of overpaying negatively influences the deal duration of M&As purchasing a public company

Overpaying for a transaction benefits the acquirer as it leads faster to the closing of the deal. We, therefore, accept the hypothesis. The impact on time to completion is thus similar as for private targets. Overpaying might create a positive atmosphere from the start on between the two merging companies. Furthermore a bid premium gives an additional incentive to the target management to close the deal as soon as possible.

H_{4B}: Prior M&A experience negatively influences the deal duration of M&As purchasing a public company

Experienced and inexperienced acquirers face the same issues while completing a M&A. The hypothesis is thus rejected. Knowledge from previous transaction even in the industry of the target company does not help to shorten the public takeover process. This finding supports the finding of Muehlfeld et al. (2012). They could not find a difference on the likelihood of deal completion between inexperienced and experienced acquirers. However, it also contradicts previous literature on deal duration (Luypaert & De Maeseneire, 2015; Hwang & Roh, 2014). The divergence might be due to an alternative definition of prior M&A experience. Luypaert & De Maeseneire (2015) might for example not have included the M&A experience from private acquisitions. Another justification for this difference could be because the sample is not industry specific like Hwang & Roh (2014).

3.3 Comparison between private and public targets

By identifying the significant proxies in the previous sections we can now compare them between public and private targets. The proxies and their significance for both target type are summarized in table 6.

	Private	Public
Hypothesis 1: Deal complexity		
Stock, mix cash & stock	Yes	Yes
Regulation	Yes	Yes
Relative Size	No	No
Deal Value	Yes	No
Hypothesis 2: Information		
Related industry	No	Yes
Distance	No	No
Acquirer's advisors	Yes	Yes
Target's advisors	No	Yes
Hypothesis 3: Likelihood of overpaying		
Acquirer's cash	Yes	Yes
MTB	No	No
Hypothesis 4: M&A		
General M&A experience	Yes*	No
Target industry M&A experience	Yes*	No
Interaction experience	Yes*	No

*This was thanks to a change in definition of prior M&A

Table 6: Summary of the statistically significant determinants of public & private targets

By performing a new two-step Heckman test the hypotheses were tested. As previously mentioned in the methodology section (see § 2.3 Methods), the interaction between the public status dummy (0 for private targets, 1 for public targets) and the investigated proxy will be computed to find out if there is a significant difference of the determinant (on deal duration) between private and public targets. The goal is to accept or reject our hypotheses by finding out if the main determinant has more impact on M&As purchasing a public company or a private company.

H_{1C}: Deal complexity has a more important impact on the deal duration of M&As purchasing a public company

The interaction between public targets and the payment method proxy is significantly different from 0 (see Appendix 16). Paying a M&A partially or totally with stocks, thus, tends to have a bigger impact on deal duration if the acquisition involves the purchase of a public target. It is, however, not the case for deal value (see Appendix 17). The effect of deal value on the deal duration tends to be more important when a private target is acquired. This is thus consistent with the tests performed in previous sections, as deal value was only a significant determinant for the private targets. Regarding regulation the impact on deal duration is assumed to be similar on both type of targets as the interaction between public targets and regulation is not significant (see Appendix 18).

These various findings made it complex to reject or accept the hypothesis concerning the determinant deal complexity. Deal value has a more important effect on deal duration of private targets while payment method impacts more the deal duration of public targets. We assume it has a similar impact but further research should be performed on this determinant to confirm this assumption.

H_{2C}: Information asymmetry has a more important impact on the deal duration of M&As purchasing a private company

Concerning information asymmetry, the two-step Heckman approach was not performed. As we could see in the description of the data as well as in the previous tests of private and public targets (see § 3.1 Private targets & § 3.2 Public targets) they all showed counter-intuitive relations with deal duration. Moreover, we declare that information asymmetry did not have a significant impact on deal duration of private or public targets. It is, however, important to mention that this statement does not apply on small-sized public targets. They suffer from the distance between the merging companies. Small-sized private targets, on the contrary, are not affected by distance (see Appendix 14 & 15). In other words the deal duration of small-sized private targets is not influenced by information asymmetry. This tends us to reject the hypothesis and conclude that information asymmetry does not play a role in the public takeover process except if the target is a small sized public company.

H_{3C}: The likelihood of overpaying has a more important impact on the deal duration of M&As purchasing a private company

The likelihood of overpaying speeds up the deal completion in the acquisitions of both types of targets. The interaction between the acquirer's cash and the public targets is not significant from 0 (see Appendix 19). The same conclusion is drawn when the test is performed for the acquirer market-to-book ratio (see Appendix 20).

This thus contradicts the hypothesis as the impact of the likelihood of overpaying has a similar effect on deal duration of private and public targets. A potential explanation is that overpaying is less observable for private entities. They do not have a benchmark like the stock market to have an approximation of their real value. Therefore the target management is not always aware of being overpaid. This can thus soften the impact of the likelihood of overpaying on deal duration of private targets and consequently lead to an effect similar to the one on public targets.

H_{4C}: Prior M&A experience has a more important impact on the deal duration of M&As purchasing a private company

Lastly we have the M&A experience. In our initial analysis this determinant was insignificant for both types. Therefore we did not perform the two-step Heckman approach on the proxies of this determinant. However, by changing the proxies' definition to Muehlfeld et al. (2012) we could see that prior M&A experience is a key determinant for private acquisitions. Performing the classification of Muehlfeld et al. (2012) to the model of public targets⁷ did not lead to the same results (see Appendix 10 & 11). Prior M&A experience proxies remain insignificant. We, therefore, accept the hypothesis and conclude that prior M&A experience has a bigger impact on deal duration of M&As purchasing a private company.

⁷ The regressions were only tested on model 2 and 3. Due to collinearity caused by the newly defined proxies it could not be performed on model 1.

Conclusion

In this paper we investigated determinants of deal duration for public companies acquiring private targets. Furthermore, the determinants of public and private targets were compared against each other. The determinants being investigated were the following: deal complexity, information asymmetry, likelihood of overpaying, and prior M&A experience.

The findings related to the private targets revealed several interesting insights. Complex M&As tend to slow down the deal duration, as the target company is private. In contrast, overpaying for the private target speeds up the process. Moreover, experienced acquirers seem to close deals faster than first-timer. Regarding information asymmetry it does not appear to impact the negotiation process.

When comparing the determinants between public and private targets, we can conclude that deal complexity, as well as the likelihood of overpayment, tend to have a similar effect on deal duration. In contrast the prior M&A experience tends to have a bigger importance on private targets. Regarding information asymmetry nor private nor public target' deal duration is globally affected by it. However, this does not count for all the public targets; as small ones tend to suffer from delays in deal duration due to information asymmetry.

There are several implications for managers. Globally executives should pay attention to similar determinants as public targets when acquiring a private target. Both determinants (i.e. deal complexity & likelihood of overpaying) influencing deal duration of public targets also have an impact on the time to completion of private targets. Additionally, looking at private targets, the time to complete the deal is also sped up by prior M&A experience. It is, however, important to mention that strong record of M&A experience does not deliver a competitive advantage relative to acquirers with a few acquisitions on their record. As a matter of fact, we assume that the learning process from previous M&As exists but it is limited to a certain extent.

Besides this, the acquirer should pay attention to the information asymmetry when acquiring a small public target. It could lead to longer deal duration and consequently to increasing costs.

Despite the important insights delivered by this paper a few limitations have to be mentioned. First the findings are based on the M&As reported in the database. The Thomson One Banker database includes an enormous number of M&As but it still lacks information on certain transaction. In future studies, it would be thus interesting to combine different databases to obtain additional information. Moreover it would be interesting to collect information not provided by databases through surveys (for example the informal relationship between the two companies prior the deal).

The second limitation of our study is related to our large set of data. It is interesting to obtain a general view on the issue, but it limits our ability to investigate more specific issue like industry effects. It would thus be interesting to further explore to gain a better knowledge on the whole deal duration issue.

Lastly, the comparison of the determinants reflecting deal complexity between private and public targets is limited to a certain degree. We assume the impact on deal duration was similar. However, further research should be performed to confirm this assumption and more proxies could be taken into consideration (for example: resistance of the target management).

Other suggestions for further research in this vaguely explored field would be to find out why information asymmetry does not affect deal duration. This is valid for private as well public targets. Academics should also further investigate the impact of prior M&A experience on deal duration, as contradicting results were obtained.

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