
Mergers and Acquisitions of Private versus Public firms: The European Case

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Resumo

Os objetivos desta dissertação são mostrar que a escolha, por parte do adquirente, de uma empresa alvo privada se deve a fatores relacionados com a informação disponível e analisar se as fusões e aquisições de empresas públicas ou privadas poderão criar diferente valor para o adquirente. O estudo é realizado no período temporal compreendido entre 2010 e 2018. O adquirente é uma empresa pública e a empresa alvo pode ser tanto pública como privada.

O procedimento bietápico de Heckman foi utilizado para controlar a endogeneidade derivada da seletividade, empregando os modelos de escolha da empresa alvo por parte do adquirente e do desempenho do adquirente. O modelo de escolha do adquirente é um modelo probit. O método de pagamento da aquisição, a maturidade da empresa alvo e a experiência alcançada, por parte do adquirente, na indústria da empresa alvo, no que diz respeito a aquisições, revelaram-se fatores significativos. A segunda etapa inclui como variável de controlo o enviesamento da endogeneidade, estimada a partir do modelo de escolha do adquirente. Fatores como a natureza da empresa alvo, a avaliação entre o valor intrínseco do adquirente com o custo de substituição do mesmo, a rentabilidade do adquirente, a localização da sede do adquirente e da empresa alvo, os adquirentes que pertencem à Zona Euro, os períodos de crise financeira nos países da Zona Euro e a experiência alcançada, por parte do adquirente, na indústria da empresa alvo, no que diz respeito a aquisições, manifestaram-se significativos.

Os resultados obtidos mostram que o efeito estimado de uma aquisição de uma empresa privada é superior, em cerca de 6 pontos percentuais, para os retornos dos adquirentes, do que de uma empresa pública.

Abstract

The goals of this dissertation are to show that information availability related issues drive the acquirer's choice for a private target and analyse if acquisitions of private and public targets can create different value for the acquirer. This study is done for the time period between 2010 and 2018. The acquirer is a public company and the target can be either a public or a private company.

The Heckman's two-step procedure was used to control the endogeneity derived from the self-selection, employing the acquirer choice model and the performance model. The acquirer choice model is a probit model. The method of payment, the maturity of the target firm and the experience obtained by the acquirer in the target's industry turned out to be significant factors. The second step has as control variable the endogeneity bias, estimated in the acquirer choice model. The nature of the target firm, the valuation between the acquirer's intrinsic value and replacement value, the profitability of the acquirer's firm, the headquarters location of both acquirer and target firm, the acquirer's that belong to the Eurozone, the periods of recession in Eurozone countries and the experience obtained by the acquirer in the target's industry, were observed to be statically significant.

The results achieved show that the estimated effect of an acquisition of a private firm is approximately 6 percentage points higher for the acquirer returns than the effect of an acquisition of a public firm.

Keywords: M&A, Private targets, Public targets, Target selection, Information availability, Acquirer returns, Self-selection, Heckman's method

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1. Introduction

The volume of mergers and acquisitions has been growing worldwide. JP Morgan states that the global merger and acquisition market remained strong in 2018 with announced transaction volumes reaching \$4.1 trillion, the third highest year ever for M&A volumes. According to the Financial Times, global merger and acquisition activity in the first nine months of 2018 set a record, eclipsing a previous high reached on the eve of the financial crisis more than a decade ago. In fact, thirty megadeals were announced in the first six months of 2018, being the first-half megadeal count on record. According to JP Morgan, the number of megadeals began to normalize throughout the second half of the year. However, they continued to be a significant driver of activity in 2018.

Although most transactions of this kind involve privately-held businesses, the majority of existing studies of merger and acquisition performance, however, have focused on acquisitions of public targets by public acquirers. Therefore, this part of the takeover market remains mostly unexplored (Ang & Kohers, 2001). This lack of research raises the following question: Do the key established findings of research on M&A hold for acquisitions of private firms? (Capron & Shen, 2007). Besides, almost all the studies that already exist focused on private firms are made considering only data from the US. When thinking about this scenario, two questions arise: (1) Do the results found on acquirer returns when buying public targets extend to the acquisitions of private targets? and (2) What drives the acquirer's choice between public and private targets? Therefore, our purpose is to understand how acquisitions of private and public targets may generate different value for the acquirer and to demonstrate that information-related issues drive the choice of a private target and, consequently, endogeneity needs to be considered in order to study the relationship between target ownership and acquirer returns in an unbiased framework.

The acquisition of privately held firms is a prevalent phenomenon that has received little attention in M&A research, so it is crucial to have enough literature that clarifies the differences between mergers and acquisitions of private and public firms, allowing acquiring firms to choose more carefully and consciously. We believe that our idea is good and by studying this we will try to overcome the lack of information and limitations of the existing research. We consider that we will be able to contribute in a positive way to M&A literature and that our study will be well succeeded.

2. Literature Review

In this section, we will address literature that is of interest for this dissertation regarding M&A. In the first place, we will briefly describe the general M&A topics, as the tendency, different types and motives. Secondly, we will concentrate on the differences between M&A of private and public targets and address the following topics: a selection of private versus public targets and returns of acquirers in acquisitions of private versus public firms.

2.1. Mergers and acquisitions

The main goal of a company is to maximize profits, which will benefit either the shareholder – by increasing shareholder’s value – or the management – by ensuring their job security and incentives.

In a perfect world, corporate assets would be channelled toward their best possible use. Mergers and acquisitions help with this process by reallocating control over companies. The main idea behind an M&A is that the combined value of the companies will be higher than the sum of the separate individual parts. When a firm reaches its peak performance or is not able to grow internally as fast as wished, M&A activity is an alternative used to obtain higher profits.

2.1.1. Tendency

Takeovers are one of the most critical events in corporate finance, both for a firm and the economy (Fuller, Netter, & Stegemoller, 2002). Since the beginning of the 20th century, several waves of corporate M&A have led to substantial industrial restructuring in different parts of the world (Bertrand & Betschinger, 2012).

The volume of M&A has been growing worldwide. According to the IMAA Institute, since 2000, more than 790 000 transactions have been announced worldwide with a known value of over 57 trillion USD. In 2018, the number of deals had decreased by 8% to about 49 000 transactions, while their value has increased by 4% to 3.8 trillion USD. JP Morgan states that the global M&A market remained strong in 2018 with announced transaction volumes reaching \$4.1 trillion, the third highest year ever for M&A volumes. Financial Times adds that global M&A activity in the first nine months of 2018 set a record, eclipsing a previous

high reached on the eve of the financial crisis more than a decade ago. In fact, thirty mega-deals were announced in the first six months of 2018, being the first-half megadeal count on record. According to JP Morgan, the number of megadeals began to normalize throughout the second half of the year. However, they continued to be a significant driver of activity in 2018. The year of 2018 counted with 44 deals compared with 32 deals in 2017, the second highest in the past 10 years.

With mergers and acquisitions being one of the fastest ways to enter in a new market and as its growing tendency is also followed in Europe, it is justified that the European market is subject to a higher level of research. Merger and acquisition activity on the European market picked up in the last few years pace compared to the years of the global recession (2007-2008). The value of M&A deals on the European market reached a total of over 989 billion US dollars, the highest value since 2008.

2.1.2. Different types

Mergers and acquisitions can be divided into different types taking into account three different aspects: value chain, relationship and the economic area (Chen & Findlay, 2003).

Table 1 Types of M&A

Value Chain	
Horizontal	The acquirer and the target are competitors in the same industry.
Vertical	Occurs when a company acquires its value chain, i.e. firms are at different stages of the production process.
Conglomerates	Involve activity between two firms whose activities are not related.
Relationship	
Friendly	Occurs when the target board and management are receptive to the idea and recommend the shareholders' approval.
Hostile	Occurs when the initial approval was unsolicited, the target was not seeking a merger at that time, the approach was contested by the target management, and control changed hands.
Economic Area	
Domestic	A deal between companies that have their headquarters in the same country.
Cross-border	A deal between companies headquartered in different countries.

2.1.3. Motives

When a company is not expanding fast enough by internal means, undertaking an external expansion can be the strategy to adopt. Although mergers success rates are low, several companies opt for M&A activity to achieve positive synergies (Alexandridis, Petmezas, & Travlos, 2010; Campa & Hernando, 2004; Eckbo, 2009; Königs & Schiereck, 2008; Lynch & Lind, 2002).

According to Andrade, Mitchell, and Stafford (2001), “economic theory has provided many possible reasons for why mergers might occur: efficiency-related reasons that involve economies of scale or other synergies; attempts to create market power, by forming monopolies or oligopolies; market discipline, as in the case of the removal of incompetent target management; self-serving attempts by acquirer management to over-expand and other agency costs; and to take advantage of opportunities for diversification, by exploiting internal capital markets and managing risk for undiversified managers.” (p.1).

According to DePamphilis (2009), the reasons why mergers and acquisitions occur are numerous, and the importance of factors giving rise to M&A activity varies over time. The author argues that synergies arise when the combination of two businesses creates higher shareholder value compared to when these are operating separately.

Table 2 Differences between operating and financial synergies

Operating synergy	
Economies of scale	Represents improvement in efficiency by producing more products in order to reduce the fixed cost per product.
Economies of scope	Use combined distinct skills and assets to produce more efficiently.
Financial synergy	
Refers to the impact of M&A on the cost of capital of the acquiring firm or the newly formed firm. A lower cost of capital is expected when compared to one of the two companies before the M&A activity.	

Mergers and acquisitions may also arise due to other motivations, such as:

Table 3 Motives for M&A to occur

Diversification	Can be related to financial synergies, resulting in a reduced cost of capital or can be used for firms to shift from their core product lines or markets into product lines or markets that have higher growth prospects.
Strategic Realignment	Firms use M&A as ways of rapidly adjusting to changes in their external environments.
Hubris	As a result of hubris (i.e., excessive overconfidence), managers may believe that their valuation of a target firm is better than the market's valuation, so the acquiring firm tends to overpay for the target.
Buying undervalued assets	Firms interested in expansion have a choice of investing in new plant and equipment or obtaining the assets by acquiring a company whose market value is less than the replacement cost of its assets (i.e., $q \text{ ratio}^1 < 1$).
Mismanagement	Arise when there is a difference between the interest of managers and the firm's shareholders. These managers may be more interested in maintaining job security and luxurious lifestyle than in maximizing shareholder value. Mergers take place to correct situations where there is a separation between what the managers want and what the owners want.
Managerialism	The managerialism motive for acquisitions states that managers make acquisitions for self-interest reasons.
Taxes	Benefit from tax loss carried forward from the acquirer firm can be used when the combined firm records profit by reducing the tax payable to be paid.
Increasing market power	Firms merge to improve their power to determine products' prices at levels that are not sustainable in a more competitive market.
Misevaluation	The misevaluation explanation as to why mergers and acquisitions happen has traditionally been overshadowed by the presumption that

¹ The q-ratio expresses the relationship between market valuation and intrinsic value, being a mean of estimating whether a given business or market is overvalued or undervalued.

	markets are efficient. Market inefficiencies not only affect investor decisions in buying individual stocks but also affect the M&A market.
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2.2. Mergers and acquisitions in private *versus* public firms

An extensive literature has focused on corporate acquisitions (Andrade et al., 2001). Moreover, several theoretical and empirical studies have been organized in order to understand why acquisitions occur and how they affect acquirers and targets (Andrade et al., 2001; Bradley, Desai, & Kim, 1983).

Quoting Shen and Reuer (2005), the question is that “while these studies provide insights into specific financial instruments in M&A, they do not focus on acquisitions of public or private firms per se, nor do they examine the more fundamental differences underlying acquisitions of public and private firms” (p. 4).

The popular press has indeed highlighted the relative importance and growing role that private firms have in the takeover markets. The volume of acquisitions involving private targets exceeds the volume of acquisitions involving public targets (Capron & Shen, 2007). However, academic research has dedicated little attention to this topic (Bargeron, Schlingemann, Stulz, & Zutter, 2008). As a result, this part of the takeover market remains mostly unexplored, since most existing studies of M&A performance are focused on acquisitions of public targets by public acquirers. This lack of research raises the following question: Do the key established findings of research on M&A hold for acquisitions of private firms? (Capron & Shen, 2007).

According to Capron and Shen (2007), differences in the information available on private and public firms influence the acquirer's selection of the target and the acquirer's performance.

There are strategy studies focused on the acquirer's choice of the target (Shen & Reuer, 2005). Nevertheless, these studies do not deal with performance implications. However, there are finance studies that deal with the performance question without considering the endogeneity of acquirer's choice of the target (Chang, 1998; Fuller et al., 2002). The point is that selecting a private versus public target is not at random and, according to Shaver (1998), empirical models that do not account for the selection process are potentially misspecified. As the goal of this work is to demonstrate that information-related issues drive the choice of a private

target, endogeneity has to be considered in order to study the relationship between target ownership and acquirer returns in an unbiased framework. This issue will be further discussed in Section 3.

2.2.1. Selection of private *versus* public targets

Akerlof (1978) defends that information economics identify information asymmetry as friction in factor markets that constrains the acquirer's choice of the target. The target selection is one of the key steps in an acquisition, so firms make strategic choices based on the expected performance of their targets.

The key difference between private and public targets is the quantity and quality of information that is available. Managers of private firms can control better the information they communicate since they are not required to disclose their financial information to the public (Arikan, 2004; Reuer & Ragozzino, 2008). Additionally, private targets are commonly associated with the lack of information provided, which limits the acquirer's search and the risk of not evaluating the firm's assets properly (Reuer & Ragozzino, 2008). Deeds, DeCarolis, and Coombs (2000) focus on the difficulty in identifying and valuing private targets, since they are less visible and transparent, being acquirers less aware of their existence. Private sellers have to increase their marketability since acquirers incur higher search costs when buying private firms because those firms face difficulties to signal their value to investors (Becchetti & Trovato, 2002). In contrast, public firms' information is quickly and widely available to acquirers. Quoting Capron and Shen (2007), "the market for corporate control for public firms serves as an information-processing and asset valuation mechanism, which is available to all bidders and complementary to the acquirer's information processing and asset valuation capabilities" (p.893).

Several factors drive the acquirer's propensity to buy a private rather than a public target.

Same-industry Acquisitions

Industry insiders can quickly identify private targets due to the higher business proximity when comparing to industry outsiders. Several authors debate this topic, and the conclusion is similar to them. Acquirers are less likely to acquire private targets when the deal is outside their core business, since industry insiders take advantage of their knowledge and familiarity with the target industry to assess the target's value and growth predictions and acquirers face

a higher likelihood of adverse selection in inter-industry transactions than in intra-industry ones and so, the risk of overvaluing the target's assets is higher (Balakrishnan & Koza, 1993; Capron & Shen, 2007; Chatterjee, 1986; Shen & Reuer, 2005; Singh & Montgomery, 1987).

Acquirer's experience in the target's industry

Acquirers having acquisition experience in target industry is one of the most significant success factors in choosing the target. Once again, since the risk of adverse selection is higher and the search is narrower for private targets, lack of acquisition experience is more worrisome when dealing with private firms than with public firms (Capron & Shen, 2007). When the acquirer has deep experience in the target industry is preferable to acquire a private firm.

Target's intangible assets

Acquirers avoid private targets whose assets' value is hugely uncertain. This argument is followed by Shen and Reuer (2005), who find that in R&D intensive industries, acquirers tend to invest in public rather than private targets. Quoting Capron and Shen (2007), "the knowledge held by the seller on the assets' quality is more difficult to communicate and to verify, which increases the likelihood of ex-ante misrepresentation" (p. 895).

Target age

The age of a firm and the extent and quality of information available on the firm are associated. Evidence suggests that it is difficult to assess the value of young firms since while old firms have more objective data about their operations, new firms have fewer data to disclose to potential investors (Henderson, 1999; Sanders & Boivie, 2004). These difficulties are lower for public targets since information disclosure regulations and observable stock prices help acquirers calibrate their offers. Therefore, if the target is a young firm, acquirers are less likely to buy a private firm than a public firm (Capron & Shen, 2007).

However, older firms are more likely to be public than younger firms. Quoting Capron and Shen (2007), "as they become more mature, firms have more opportunities to go public than younger firms because of investors' confidence in longstanding firms, the firm's higher ability to file for an IPO, and the increasing need to make acquisitions" (p. 895). Consequently,

regarding old targets, acquirers are more likely to buy a public firm because of the “population effect” and, regarding young targets, acquirers are more likely to acquire a private firm (Capron & Shen, 2007). Therefore, acquirers are more likely to acquire private targets than public targets when the target is young.

2.2.2. Returns of acquirers in acquisitions of private *versus* public targets

Acquirer's returns are affected by the listing status of the target, and there are numerous reasons for that.

Several studies find that acquirers have positive abnormal returns for acquisitions of private firms and negative ones for acquisitions of public firms (Conn, Cosh, Guest, & Hughes, 2005; Fuller et al., 2002; Hansen & Lott, 1996; Moeller, Schlingemann, & Stulz, 2004). Hansen and Lott (1996) go further and state that acquirers experience a two per cent higher return when purchasing a private firm compared to a public firm. Fuller et al. (2002) find positive abnormal announcement returns in a sample of repeat acquirers of private targets. Moreover, Moeller et al. (2004) find the same results in a large and relatively unrestricted sample. Faccio, McConnell, and Stolin (2006) obtain the same results for a non-US acquirers' sample.

There are several explanations for the acquirers' higher returns when the target is a private firm. Capron and Shen (2007) state that acquirers are more likely to appropriate the value generated from acquisitions with private targets due to higher price discount, lower acquirer competition and lower publicity associated with private targets. The first explanation is based on a liquidity discount for private targets. Acquirers pay a lower price when purchasing a private target since private firms are not as easy to purchase as public firms. According to Officer (2007), the liquidity discount results in higher acquirer returns for acquisitions of large private targets and lower acquirer returns for acquisitions of large public targets. The second explanation is related to the limited competition for private targets, and it is associated with the higher costs of obtaining accurate information on these firms (Chang, 1998). The third explanation is based on the fact that private information on private targets is less likely to be dispersed because of the lower publicity on the acquisition of private firms. Private targets may become aware of the existence of the acquirer's private information during the negotiation, but they would not have means of appropriating the value of it (Capron & Shen, 2007).

All cash and All shares

There is little research about the method of payment on either the short or long-run returns to public acquirers that acquire private targets (Fuller et al., 2002; Conn, Cosh, Guest, & Hughes, 2005).

In the case of public targets, acquirers use the stock as a method of payment if the board believes that its shares are overvalued. Knowing that target shareholders tend not to accept stock. In the case of private targets, acquirers have positive reactions for both stock and cash offers (Myers & Majluf, 1984). Higher valued acquirers use cash or a higher proportion of cash to signal their value to the market (Berkovitch & Narayanan, 1990; Eckbo, Maksimovic, & Williams, 1990; Fishman, 1989). However, if there is uncertainty about the target's value, the acquirer may not want to offer cash, since the target will only accept an offer higher than its actual value and so the acquirer will overpay (Fuller et al., 2002). Acquirers should make cash offers when there is high uncertainty on their own firm's value and stock offers when there is high uncertainty on the target's value (Fuller et al., 2002; Martin, 1996).

Using stock to buy private target results in higher acquirer returns (Chang, 1998; Faccio et al., 2006; Fuller et al., 2002). Moreover, Officer, Poulsen, and Stegemoller (2008) show that the acquirer's use of stock as a method of payment mitigates the adverse effects of information asymmetry on acquirers and results in positive announcement returns. Nevertheless, Moeller et al. (2004) find no difference between stock and cash payments.

However, the payment choice in mergers and acquisitions is not only between full cash and full share payment. The literature on mixed cash-shares payments is relatively recent. Mixed payment has become increasingly important in mergers and acquisitions activity, particularly when considering offers for large firms (de La Bruslerie, 2013). Research developed by Goergen and Renneboog (2004) and Faccio and Masulis (2005) shows that although the percentage of mixed payments is not significant, mixed payments represent a higher proportion of transactions as the value of transactions rises. Studies developed by Martynova and Renneboog (2006) and André and Ben-Amar (2009) show an increasing percentage of mixed payments.

Target relative size to the acquirer

The theoretical and empirical literature on M&A activity suggests that several characteristics of the acquisition may affect acquirer's returns, including the relative size. Faccio et al. (2006) and Asquith, Bruner, and Mullins Jr (1983) find a positive relation between acquirer announcement returns and relative size in private and public acquisitions.

The greater relative size provides higher bargaining power to the target, the more significant potential for recombination and scale economies (Kooli, Kortas, & L'her, 2003).

Agrawal, Jaffe, and Mandelker (1992) find that acquiring a large target is a more significant economic event for the acquirer than acquire a small target.

Cross-border acquisitions

According to Conn et al. (2005), domestic public acquisitions result in negative announcement returns, while cross-border public acquisitions result in zero announcement returns. In contrast, both domestic and cross-border private acquisitions result in positive announcement returns.

Geographic diversification allows firms to expand their boundaries. Quoting Conn et al. (2005), "this expansion permits the internalization of synergies based on intangible information-based assets that would otherwise be lost because of various market failures" (p.820). Among cross-border acquisitions, those involving high-tech firms and low national cultural differences perform relatively well, which is consistent with the interpretation of the gains of geographical diversification. Overall, cross-border acquisitions result in lower announcement returns than domestic acquisitions.

Acquirer's size

Schwert (2000) and Loderer and Martin (1990) find that larger acquirers have lower announcement returns and Moeller et al. (2004) adds that larger acquirers earn approximately two per cent lower announcement returns than do smaller acquirers. This effect is known as the size effect, and several theories try to explain it, as the hubris hypothesis by Roll (1986),

the herding phenomenon by Persons and Warther (1997) and the free-cash-flow hypothesis by Jensen (1986).²

Moeller et al. (2004) document significantly higher returns for smaller acquirers regardless of the type of the target. They also report that acquirers of private targets have significantly higher returns than do acquirers of public targets. These conclusions are also proven by Faccio et al. (2006), reporting that bigger acquirers tend to purchase public targets and, consequently, have negative returns and, on the contrary, smaller acquirers tend to purchase private targets and have positive returns. They add that both small and big acquirers tend to earn significant positive returns when purchasing private targets and negative returns when purchasing public targets. Furthermore, they also state that both small and big acquirers of private targets earn returns that are significantly higher than those for small and big acquirers of public targets. Quoting Faccio et al. (2006), “the listing effect in acquirer’s stock returns is not a size of buyer effect in disguise” (p. 209).

Tobin’s Q

Abnormal returns in acquisitions are related to Tobin’s Q ratios of the target and the acquirer. Both target, acquirer and total returns are higher when targets have high q ratios, and acquirers have low q ratios (Lang, Stulz, & Walkling, 1989). They also find that acquirers with high Tobin’s Q gain more than acquirers with low Tobin’s Q. In general, the best acquisitions, in terms of value creation, are those where a high q firm acquires a low q firm.

Tobin’s Q is a measure of managerial performance. Therefore, Lang et al. (1989) findings imply that firms with better performance make better acquisitions, and more value can be generated from acquisitions when compared with firms with poor performance.

Investor protection

Acquirers can be affected by the legal protection offered to investors in the target country. It is expectable that agency problems are lower when the target firm is in a country with higher shareholder protection, which may affect the acquirer’s returns.

² For further details, see Table 15 in Annex A.1.

Financial markets are more developed in countries with strong investor protection, and so, firms that belong to these countries have facilities to raise financing for investment. Moreover, firms in these countries show more significant growth and, consequently, higher valuation.

Regarding public targets, acquirer's returns are significantly negative when the target belongs to a country with high investor protection and significantly positive when the targets belong to a country with low investor protection (John, Freund, Nguyen, & Vasudevan, 2010). Looking at private targets, researchers found no significant difference between acquirer returns in high and low investor protection countries. These findings show that investor protection is significant for public targets but insignificant for private targets.

Eurozone

Macroeconomic effects of the euro have been widely studied. However, the literature paid less attention to the microeconomic consequences, and only a few authors have considered if and how the euro has impacted firm-level decision-making (McCarthy & Dolfsma, 2015).

The euro has significantly increased the number of deals announced, which supports the idea that policy influences firm geography and the idea that the euro strengthened the levels of deal-making in the Eurozone (Bjorvatn, 2004; Blanco, 2001; Coeurdacier, De Santis, & Aviat, 2009; Ekkayokkaya, Holmes, & Paudyal, 2009; Manchin, 2004; Moschieri & Campa, 2009; Sudarsanam, 2003). Researchers add that although the euro has a positive impact on the number of deals announced within the Eurozone, the same does not happen with deals announced in European countries that do not belong to the Eurozone. Researchers findings show that the euro influences positively and significantly the performance of the firm, mainly in the case of acquisitions involving Eurozone targets.

Recession

Neoclassical theory suggests that the occurrence of mergers and acquisitions is a consequence of economic shocks (Harford, 2005; Mitchell & Mulherin, 1996). However, there is limited research on acquisitions during the recent financial crisis and the subsequent economic recession.

There is no doubt that the 2007-08 financial crisis affected firms' transactions in Europe. Quoting Nicholson and Salaber (2014), "shareholders give more value to acquisitions announced after the financial crisis due to higher risks and returns associated with undertaking acquisitions during the bad economic time" (p. 7). This quote is consistent with their findings since acquirer's short-term performance is significantly higher in the post-crisis period than in the pre-crisis period. They also studied the impact of the crisis in acquisitions of countries within the Eurozone and outside the Eurozone. After the crisis, there is an uncertain environment among the Eurozone countries. Countries that are members of a monetary union carry certain obligations as regulations and inflexibility, which does not happen to countries that do not belong to a monetary union. Furthermore, the market can reward the flexibility and financial certainty of non-Eurozone countries. For these reasons, results show that transactions involving countries that do not belong to the Eurozone have better returns than do those within the Eurozone during periods of recession (Nicholson & Salaber, 2014).

2.3. Summary and other control variables

Other control variables will be used, and a brief discussion is presented below.

PIIGS

PIIGS was considered since it represents a group with emergent similarities that illustrates the poor economic performance of these countries. Due to that, we thought it was interesting to see if being part of this group is a relevant aspect. We did not find research that relates PIIGS to acquirer's returns.

Acquirer pre-merger profitability

When a firm is performing poorly, it may opt to acquire another firm to hide its poor results and to try new ways of growing. They may also have limited skills in improving the target's value. This variable is used in Capron and Shen (2007), but no previous literature was found. It is expected a negative relationship between acquirer pre-merger profitability and acquirer's cumulative abnormal returns, since if the acquirer is performing poorly the probability of opting for an acquisition increase.

Lastly, Table 4 summarizes the expected signs between the dependent and independent variables of both models presented in Section 4.

Table 4 Summary of the expected signs

Variable examined	Acquirer's propensity to purchase a private target	Acquirer's returns in an acquisition of a private target	Authors
Same-industry acquisitions	+		Chatterjee (1986); Singh and Montgomery (1987); Balakrishnan and Koza (1993); Shen and Reuer (2005); Capron and Shen (2007).
Acquirer's experience in the target's industry	+		Capron and Shen (2007).
Target's intangible assets	-		Capron and Shen (2007); Shen and Reuer (2005).
Target age	+/-		Henderson (1999); Sanders and Boivie (2004); Capron and Shen (2007).
All cash and All shares	+		Chang (1998); Faccio et al. (2006); Fuller et al. (2002); Officer et al. (2008).

Private		+	Chang (1998); Faccio et al. (2006); Fuller et al. (2002); Hansen and Lott (1996); Conn et al. (2005); Moeller et al. (2004); Capron and Shen (2007); Hansen and Lott (1996).
Target relative size to the acquirer		+	Faccio et al. (2006); Asquith et al. (1983); Kooli et al. (2003); Agrawal et al. (1992).
Cross-border acquisitions		-	Conn et al. (2005).
Acquirer's size			Schwert (2000); Loderer and Martin (1990); Moeller et al. (2004); Roll (1986); Persons and Warther (1997); Jensen (1986); Faccio et al. (2006).
Tobin's Q		+	Lang et al. (1989).
Investor protection		No significant difference	John et al. (2010).

Eurozone		+	McCarthy and Dolfma (2015); Bjorvatn (2004); Blanco (2001); Coeurdacier et al. (2009); Ekkayokkaya et al. (2009); Manchin (2004); Moschieri and Campa (2009); Sudarsanam (2003).
Recession		-	Harford (2005); (Mitchell & Mulherin, 1996); Nicholson and Salaber (2014).
PIIGS		?	
Acquirer's pre-merger profitability		-	

2.4. Research Hypothesis

Although academic research has neglected to explore mergers and acquisitions of private targets, known research on this field is done by, for example, Chang (1998), Ang and Kohers (2001), Faccio et al. (2006), Capron and Shen (2007) and Fuller et al. (2002). However, the research results have not captured why private target acquirers have better merger results. We will use more recent data and, hopefully, this new data could help us to find the factors that determine the success of private target acquisition. The research hypothesis that will be tested are the following ones:

Table 5 Research hypothesis

Research Hypothesis	
RH1	Acquirers are less likely to acquire private targets than public targets when the deal is outside their core business.
RH2	Acquirers are more likely to acquire private targets than public targets when their acquisition experience in the targeted industry is high.
RH3	Acquirers are more likely to acquire private targets than public targets when the targeted assets are highly intangible.
RH4	Acquirers are less likely to acquire private targets than public targets when the target is a young firm.
RH5	Acquirers are more likely to acquire private targets than public targets when the target is a young firm.
RH6	Acquirer returns, upon the announcement of the acquisitions, of private targets, are higher than the ones of public targets.

3. Self-selection and Performance

One of our goals is to examine if acquirer's choice of the target influences acquirer's performance. A possible problem is a misspecification. Acquirers choose strategies based on firm's features and industry environments that are difficult to measure and so, they are unobservable. These characteristics affect performance and are omitted. Empirical models will suffer from omitted variable bias, and their results may be misleading.

Furthermore, the strategy choice is endogenous and self-selected. There is a vast difference between firms that self-select their strategies and firms that are randomly assigned to their strategies. As selecting a private versus a public target is not random, our model has to consider the endogeneity of that selection.

Selection-based endogeneity (Heckman, 1977, 1979) exhibits in two main forms: sample-selection and self-selection biases. In the context of this work, the self-selection bias derives not from sample selection but instead from the studied acquirers making choices regarding tasks into the mutually-exclusive treatment and non-treatment groups based on unobservable variables that correlate with both outcomes and observable predictors.

The preceding discussion about the potential problems of choice models will be next formalized in our particular case.

Once a firm decides to acquire, it must then choose the nature of the target. Assuming *Private** is an unobservable continuous variable function of $k-1$ explanatory variables $W_2, W_3, \dots, W_k$, consider the following relationship:

$$Private_i^* = \gamma_1 + \gamma_2 W_{2i} + \gamma_3 W_{3i} + \dots + \gamma_k W_{ki} + u_i, \quad (1)$$

alternatively, in matrix form,

$$Private_i^* = \mathbf{W}_i \boldsymbol{\gamma} + u_i, \quad (2)$$

where the row vector $\mathbf{W}_i$ is given by $[1 \ W_{2i} \ W_{3i} \ \dots \ W_{ki}]$ and column vector $\boldsymbol{\gamma} = [\gamma_1 \ \gamma_2 \ \gamma_3 \ \dots \ \gamma_k]'$

with

$$Private_i = \begin{cases} 1, & \text{if } Private_i^* > 0 \\ 0, & \text{if } Private_i^* \leq 0 \end{cases}, \quad (3)$$

and u_i is an error term that is normally estimated with zero mean and unit variance. Private is a binary variable that takes the value one if the acquirer chooses a private target, and 0 if a public target is chosen. This is the formulation of a probit model, and it will be called acquirer's choice model.

Now to estimate the acquirer's performance, the following equation is used:

$$Performance_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_l X_{li} + \delta Private_i + \varepsilon_i, \quad (4)$$

alternatively, in matrix form,

$$Performance_i = \mathbf{X}_i \boldsymbol{\beta} + \delta Private_i + \varepsilon_i, \quad (5)$$

where $\mathbf{X}_i = [1 \ X_{2i} \ X_{3i} \ \dots \ X_{li}]$ and $\boldsymbol{\beta} = [\beta_1 \ \beta_2 \ \beta_3 \ \dots \ \beta_l]'$, Performance is the acquirer's performance, $X_2, X_3, \dots, X_l$ are the $l-1$ explanatory variables that affect the acquirer's performance, and ε_i is an error term with zero mean and variance σ_ε^2 . Equation (4) will be called a performance model.

The error terms u_i and ε_i will be correlated if unobservable effect captured in u_i is the same as in ε_i . Hence, according to Shaver (1998), u_i and ε_i will be correlated unless these factors can be measured and included in X_i .³

In our case, regardless of the nature of the target, an acquirer would expect a firm with better management, an innovativeness culture and superior skills to outperform firms lacking these capabilities. Therefore, the errors will be correlated. If the Equation (5) is estimated without accounting for the self-selection of the acquirer's choice of the target and interpret δ as the estimate of the performance effect of choosing acquisition strategies on performance, the results would be misleading or incorrect. Several estimation methods in econometrics literature control for self-selection (see, e.g., Heckman (1979) and Maddala (1986)).

³ In order to facilitate the estimation, we assumed that u_i and ε_i are distributed bivariate normal with linear correlation ρ .

4. Data and Methodology

This dissertation aims to demonstrate that information-related drivers drive the acquirer's choice of the target and to understand if this choice generates different value for the acquirer depending on the nature of the target chosen.

Section 4.1. starts by approaching the data sources used and establishing the final sample in the study. In Section 4.2. will be explained the methodology followed in detail and define the variables that were considered. Two models will be studied: acquirer's choice model and performance model. Finally, Section 4.3. presents some descriptive statistics.

4.1. Data Sources

The sample consists of acquirer's choice between private and public targets with performance implications within Europe in the period 2010 to 2018. The primary data were collected from the Zephyr database. Some deals were excluded since had to meet the following criteria: (i) the deal is completed; (ii) each deal has only one acquirer and one target; (iii) announcement and completion dates are known; (iv) announcement dates are between January 1, 2010, and December 31, 2018; (v) the acquirer's and target's country are European⁴; (vi) the acquirer is a public firm and the stock prices and index prices are available for the event and the estimation period and (vii) the target is either a public or a private firm. The resulting sample is 130 public acquirers from 19 countries that were involved in 157 transactions. Among the 130 acquirers, 27 acquirers were involved in more than one transaction over the period considered. Moreover, only 36 transactions (representing 22.93% of the total of transactions).

Other data sources were additionally used. Thomson Reuters Eikon database was used to collect the acquirer's weekly returns, and the weekly returns for the market index were collected from Investing.com. We also use the Amadeus database to access the age of each target. We turned to the World Bank website to collect the investor protection index and to the Reserve Bank of St. Louis to collect the periods of the recession of each country in the study. See Table 10 in Appendix for further information.

⁴ The following regions are considered: European Union enlarged (28), Eastern Europe, Western Europe, Euro-Area, European Union.

4.2. Methodology and variable definitions

Acquirer Choice Model

Private is the dependent variable in the acquirer's choice model. *Private* takes the value of 1 when a private target is chosen and 0 when a public target is chosen. The set of independent variables are factors that have been previously identified, in Section 2, which affect the decision between private versus public target. The independent variables are the following ones. *Same industry* specifies if the acquirer and the target belong to familiar industries or not. It is a dummy variable that takes the value of 1 if the acquirer and the target are in the same industry, and 0 otherwise. *Target intangibles* indicate if the target firm operates in a high-intangible industry. As high-tech industries, we consider the following ones: industrial, electric and electronic machinery; computer hardware; computer software and biotechnology and life sciences. It is a binary variable that takes the value of 1 if the target operates in a high-intangible industry, and 0 otherwise. *Target age* is used to analyse if the target is a young or an old firm. *Acquirer M&A experience in target industry* indicates the number of acquisitions done by the acquirer in the target's industry previous to the focal transaction, measuring the acquirer's experience. The variable *All shares* indicates the method of payment used in the acquisitions. It is a binary variable that takes the value of 1 if the deal is a 100% shares deal, and 0 otherwise. The variable *All cash* indicates the method of payment used in the acquisitions. It is a binary variable that takes the value of 1 if the deal is a 100% cash deal, and 0 otherwise.

Performance Model

The performance measure employed is Cumulative Abnormal Returns (*CAR*). The methodology used to get *CAR* data is an event study. There are three fundamental steps for conducting the event study: identify the event interest and, in particular, the timing of the event; specify a benchmark model for normal stock return behaviour; and calculate and analyse abnormal returns around the event date. Concerning the event of interest and timing, it is expected that potential changes in value were already reflected in the stock price of the target and the acquirer around the announcement of the acquisition. Identifying the actual date of the acquisition as the event date would not give us relevant results since the announcement

of the acquisition is usually a long time before the actual acquisition. So, we identified as event date the announcement date.

The event window is the period, surrounding the event, in which the abnormal returns are calculated. The event window has a length of 31 days, since the value of t starts in -15 and ends at +15, plus the announcement day.

The benchmark models are used to calculate the abnormal returns, and there is a wide variety of benchmark models available. Our empirical analysis is based on the event study methodology originally introduced by Fama, Fisher, Jensen, and Roll (1969). We use the weekly acquirer's stock returns and the weekly index returns on which the acquirer is traded.

Let R_{jt} designate the observed arithmetic return for company j at day t and R_{mt} the returns on the corresponding benchmark indices for market m at day t .

By using the market model, the expected weekly return for each company is calculated as:

$$E(R_{jt}) = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt}, \quad (6)$$

where $E(R_{jt})$ is the expected return of the stock of company j on day t , α_j and β_j are the model parameters that are estimated using the OLS regression during the estimation period, and ε_{jt} is the residual disturbance term.

By getting the estimates by Ordinary Least Squares (OLS), weekly stock prices of each company were aligned with the corresponding returns of the market for the same period. The value of t starts in -365 and ends at -15, considering the announcement day.

To compute the abnormal returns of the stock of company j on day t (AR_{jt}) we subtract $E(R_{jt})$ from the observed stock returns R_{jt} between [-15, +15] event window, as follows:

$$AR_{jt} = R_{jt} - E(R_{jt}). \quad (7)$$

Abnormal returns are calculated for any individual security and aggregated over time and the sample of the N securities, determining the Cumulative Abnormal Returns (CAR), given by:

$$CAR_{jt} = \sum_{t=t_1}^{t_2} AR_{jt}.^5 \quad (8)$$

⁵ With t_1 and t_2 being the event window ranging from days -15 to +15.

Finally, to identify the critical value drivers, we apply multivariate regression analysis to a series of deal characteristics specific from the acquirer, target and transaction.

Let us describe the explanatory variables; the underlying theory was already stated in Section 2. *Private* indicates the nature of the target firm. It is a binary variable that takes the value of 1 if the target is a private firm and 0 if it is a public firm. This is the variable of interest since the goal is to capture the relationship between *Private* and *CARs*. The following control variables will be used. *Cross-border* indicates if the acquirer and the target firm operate in the same country or not. It is a binary variable that takes the value of 1 if the acquirer and the target firm do not operate in the same country, and 0 otherwise. *Size* identifies if the acquirer firm is a large or small firm. *Relative market value* is the ratio between the transaction value divided by the market capitalization. *Tobin's Q* is the sum of market capitalization and total liabilities divided by total assets. This variable is a mean of estimating whether acquirer's firm is overvalued or undervalued. *Investor protection* is an average of three indices: the extent of disclosure, the extent of director liability and the ease of shareholder suit; and, measure the protection given to an investor of a country. It is a number between zero and ten that is attributable to each country and year.

Target relative size assesses the relative proportion of the target's sale to the acquirer's sales. *Pre-deal acquirer profitability* gives us information about the profitability of the acquirer before the deal takes place. *PIIGS* is the acronym for a group of countries with emergent similarities: Portugal, Ireland, Italy, Spain and Greece. *Eurozone* is a variable composed of countries which belong to the Eurozone. *Recession* approaches the periods of recession by country. Other independent variables used, *Same industry*, *Acquirer's M&A experience in the target industry*, *Target age* and *All shares*, are previously defined in Acquirer's Choice Model.

For a summary of the definitions of dependents and independent variables for the acquirer's choice model and performance model described in this section and data sources explanation in the previous section, see Table 21 in Annex A.2.

4.3. Descriptive Statistics

The number of acquisitions, regardless of the nature of the target, per year, can be observed in Table 6. Most transactions were executed in 2016 (15.29%), followed by 2011 (14.01%) and 2017 (13.38%). In contrast, 2010 (4.46%) and 2012 (7.64%) were the years with fewer

acquisitions. Most of the deals took place in the second half of the sample, comprising the years between 2014 until 2018 (62.42%), with an average of 19.6 deals per year. Table 6 also shows that most acquisitions (91.08%) result in acquirer's cumulative abnormal returns between [-20%, 0%) and [0%, 20%).

Table 6 Descriptive statistics of acquisitions per year and CARs

Number of acquisitions							
Year	Cumulative Abnormal Returns (<i>CAR</i>)					Total	%
	[-40%, -20%)	[-20%, 0%)	[0%, 20%)	[20%, 40%)	[40%, 60%)		
2010	0	4	2	1	0	7	4.46
2011	0	16	5	1	0	22	14.01
2012	1	5	5	1	0	12	7.64
2013	1	7	8	1	1	18	11.46
2014	0	10	7	0	0	17	10.83
2015	1	8	6	1	0	16	10.19
2016	1	6	15	2	0	24	15.29
2017	1	9	10	1	0	21	13.38
2018	0	10	10	0	0	20	12.74
Total	5	75	68	8	1	157	100.00

In Table 7, the number of acquisitions of public firms per year is reported. Most acquisitions of public firms happened during the years of 2018 (27.78%) and 2011 (25.00%). On the other hand, the years of 2010 and 2016 were the years with fewer acquisitions of public firms, representing merely 2.78% in each year. Most acquisitions (66.67%) result in acquirer's cumulative abnormal returns between [-20%, 0%), which is consistent with previous findings that report that acquisitions of public firms result in negative returns (Conn et al., 2005; Fuller et al., 2002; Hansen & Lott, 1996; Moeller et al., 2004).

Table 7 Descriptive statistics of acquisitions of public firms per year and CARs

Number of acquisitions of public firms							
Year	Cumulative Abnormal Returns (<i>CAR</i>)					Total	%
	[-40%, -20%)	[-20%, 0%)	[0%, 20%)	[20%, 40%)	[40%, 60%)		
2010	0	1	0	0	0	1	2.78
2011	0	9	0	0	0	9	25.00
2012	0	2	0	0	0	2	5.56
2013	0	2	0	0	1	3	8.33
2014	0	3	2	0	0	5	13.89
2015	1	1	1	0	0	3	8.33
2016	0	0	1	0	0	1	2.78
2017	1	1	0	0	0	2	5.56
2018	0	5	5	0	0	10	27.78
Total	2	24	9	0	1	36	100.00

Table 8 gives information about the number of acquisitions of private firms per year. Most acquisitions of private firms occur during the years of 2016 (19.01%) and 2017 (15.70%). Even so, the years 2011, 2013 and 2015 also represent a significant part of the number of acquisitions of private firms, with 10.74%, 12.40% and 10.74%, respectively. The year with fewer acquisitions of private firms is 2010, with only 4.96%. Once again, most acquisitions result in acquirer's cumulative abnormal returns between [-20%, 0%) and [0%, 20%), being [0%, 20%) the most representative one (48.76%). This result is also consistent with previous findings since acquisitions of private firms usually result in positive abnormal returns.

Table 8 Descriptive statistics of acquisitions of private firms per year and CARs

Number of acquisitions of private firms							
Year	Cumulative Abnormal Returns (<i>CAR</i>)					Total	%
	[-40%, -20%)	[-20%, 0%)	[0%, 20%)	[20%, 40%)	[40%, 60%)		
2010	0	3	2	1	0	6	4.96
2011	0	7	5	1	0	13	10.74
2012	1	3	5	1	0	10	8.26
2013	1	5	8	1	0	15	12.40
2014	0	7	5	0	0	12	9.92
2015	0	7	5	1	0	13	10.74
2016	1	6	14	2	0	23	19.01
2017	0	8	10	1	0	19	15.70
2018	0	5	5	0	0	10	8.26
Total	3	51	59	8	0	121	100.00

Most acquirers are from the United Kingdom. This is not surprising because, in contrast to other European countries, acquisitions in the United Kingdom are seen as a central purpose for the stock market (Franks & Mayer, 1990).

In Table 9, we can observe the number of acquisitions per country, regardless of the nature of the target. Acquirer companies from the United Kingdom do 28.66% of the acquisitions, followed by Poland and Sweden that do 12.74% and 8.92% of the acquisitions, respectively.

Table 9 Descriptive statistics of acquisitions per country and CARs

Number of acquisitions							
Country	Cumulative Abnormal Returns (<i>CAR</i>)					Total	%
	[-40%, -20%)	[-20%, 0%)	[0%, 20%)	[20%, 40%)	[40%, 60%)		
BE	0	0	3	1	0	4	2.55
CH	0	1	2	0	0	3	1.91
DE	1	7	4	0	0	12	7.64
DK	1	0	1	0	0	2	1.27
ES	0	4	4	1	0	9	5.73

FI	0	2	6	0	0	8	5.10
FR	1	6	4	0	0	11	7.01
GB	0	23	18	4	0	45	28.66
IE	0	1	1	0	0	2	1.27
IT	0	3	6	0	0	9	5.73
NL	0	0	1	0	1	2	1.27
NO	0	0	1	1	0	2	1.27
PL	0	17	3	0	0	20	12.74
PT	0	0	2	0	0	2	1.27
RO	0	2	0	0	0	2	1.27
RU	0	1	2	0	0	3	1.91
SE	1	4	8	1	0	14	8.92
SI	0	0	1	0	0	1	0.64
TR	1	4	1	0	0	6	3.82
Total	5	75	68	8	1	157	100.00

Table 10 gives information about the number of acquisitions of public firms per country. In this case, we highlight Poland as the country with most acquisitions of public firms (36.11%). These acquisitions result in acquirer's cumulative abnormal returns of [-20%, 0%), which is consistent with previous findings.

Table 10 Descriptive statistics of acquisitions of public firms per country and CARs

Acquisitions of public firms							
Country	Cumulative Abnormal Returns (<i>CAR</i>)					Total	%
	[-40%, -20%)	[-20%, 0%)	[0%, 20%)	[20%, 40%)	[40%, 60%)		
BE	0	0	0	0	0	0	0.00
CH	0	1	1	0	0	2	5.56
DE	1	1	1	0	0	3	8.33
DK	0	0	0	0	0	0	0.00
ES	0	2	0	0	0	2	5.56
FI	0	0	0	0	0	0	0.00
FR	0	1	1	0	0	2	5.56
GB	0	0	0	0	0	0	0.00
IE	0	0	1	0	0	1	2.78
IT	0	0	0	0	0	0	0.00
NL	0	0	0	0	1	1	2.78
NO	0	0	0	0	0	0	0.00
PL	0	11	2	0	0	13	36.11
PT	0	0	1	0	0	1	2.78
RO	0	2	0	0	0	2	5.56
RU	0	1	0	0	0	1	2.78
SE	0	1	0	0	0	1	2.78
SI	0	0	1	0	0	1	2.78
TR	1	4	1	0	0	6	16.67
Total	2	24	9	0	1	36	100.00

In Table 11, we can observe the distribution of the acquisitions of private firms per country. Contrary to the acquisitions of public firms, the country that can be highlighted is the United Kingdom with 37.19% of the acquisitions. We can also mention Sweden as the second country with a higher number of acquisitions of private firms (10.74%).

Table 11 Descriptive statistics of acquisitions of private firms per country and CARs

Acquisitions of private firms							
Country	Cumulative Abnormal Returns (<i>CAR</i>)					Total	%
	[-40%, -20%)	[-20%, 0%)	[0%, 20%)	[20%, 40%)	[40%, 60%)		
BE	0	0	3	1	0	4	3.31
CH	0	0	1	0	0	1	0.83
DE	0	6	3	0	0	9	7.44
DK	1	0	1	0	0	2	1.65
ES	0	2	4	1	0	7	5.79
FI	0	2	6	0	0	8	6.61
FR	1	5	3	0	0	9	7.44
GB	0	23	18	4	0	45	37.19
IE	0	1	0	0	0	1	0.83
IT	0	3	6	0	0	9	7.44
NL	0	0	1	0	0	1	0.83
NO	0	0	1	1	0	2	1.65
PL	0	6	1	0	0	7	5.79
PT	0	0	1	0	0	1	0.83
RO	0	0	0	0	0	0	0.00
RU	0	0	2	0	0	2	1.65
SE	1	3	8	1	0	13	10.74
SI	0	0	0	0	0	0	0.00
TR	0	0	0	0	0	0	0.00
Total	3	51	59	8	0	121	100.00

5. Results

The two-step Heckman (1979) method was used to estimate the information-related drivers of the acquirer's choice for a private target and to estimate how acquisitions of private and public targets may generate different value to the acquirer, employing the acquirer's choice model and the performance model explained in Section 4.

First, we estimated by maximum likelihood (ML) estimation the acquirer's choice model as a probit model, defined in Equations (1), (2) and (3), because the dependent variable is binary. This is the first step of Heckman's method. Note that according to this method at least one variable in the first step should not appear in the second step. In our case, the variables *Target intangibles* and *All cash* appear only in the acquirer's choice model.

The second step includes the lambda endogeneity bias control variable obtained from the acquirer's choice model. Lambda (known in the econometrics as the inverse of the Mills ratio) is incorporated to test the presence of endogeneity biases and to remove them. Therefore, unbiased estimates for the effects of target ownership on acquirer returns are obtained.

Acquirer's choice model

The vector $\mathbf{W}_i$ includes an intercept and the following independent variables: *All Shares*, *All Cash*, *Same industry*, *Target intangibles*, *Target age* and *Acquirer's M&A experience in the target industry*.

As it can be assessed, in the first column of Table 12, which reports the probit results of the acquirer choice model, the regression provides a statistically significant relationship between the dependent variable and the independent variables, for a significance level of 1% and a McFadden R^2 value of 0.197 was obtained. The variables *All Shares*, *All Cash*, *Target age* and *Acquirer's M&A experience in target industry* are individually statistically significant. The first two at a significance level of 1% and the others at 5%. The four coefficients estimates are negative. As the variables *Same industry* and *Target intangibles* are not statistically significant, research hypotheses 1 and 3 cannot be proven or disproven.

The estimated coefficient of the variable *Acquirer's M&A experience in target industry* is not consistent with the expected sign. However, as will be shown below, the estimated marginal effect is small. Therefore, research hypothesis 2 is rejected.

Two contradictory research hypotheses, 4 and 5, were developed concerning the variable *Target age* because of the existing literature, discussed in Section 2, by Capron and Shen (2007). Our results show a negative relationship between the age of the target firm and the probability of acquiring a private firm. Hence, research hypothesis 4 is not rejected, while research hypothesis 5 is rejected.

Concerning the dummy variables *All cash* and *All shares*, using an all-shares payment can be associated to an acquirer's overvaluation or to an uncertainty about the benefits of the acquisition, since those benefits are apportioned when target's shareholders become acquirer's shareholders. A higher confidence regarding the benefits of the acquisitions may result in cash payments.

Notwithstanding, the coefficient estimates for binary choice models only provide the sign of the relationship between the marginal effect of the explanatory variable in the probability of acquiring a private target. Marginal effects were calculated and are presented in Table 12. Assuming the sample data, if the *Target age* increases by one year, the estimated probability of acquiring a private firm decreases in 0.17 pp (percentage points). Similarly, if the *Acquirer's experience in target industry* increases by one acquisition, the estimated probability of acquiring a private firm decreases in 0.20 pp. The estimated probability of acquiring a private firm is smaller by 32.88 pp when paid with cash relatively to a mixed payment. In the case of shares payment, the effect is higher approximately 11 pp.

Table 12 Estimated marginal effects

Variable	Estimated marginal effect
Target age	-0.0017
Acquirer's M&A experience in the target industry	-0.0020
All cash	-0.3288
All shares	-0.4196

Note | The estimated marginal effects for the continuous variables used were calculated as an average of the estimated marginal effects for each of the observations of the sample. In the case of the dummy variables, it was obtained subtracting to the average of the estimated probability of *Private*=1 when dummy=1 the average of the estimated probability of *Private*=1 when dummy=0, all the other variables assumed the value for the sample.

Performance model

Due to the diversity of acquirer's countries of our sample, several models were estimated in order to capture potential differences by using additive and multiplicative dummies. Two different groups of countries were considered: PIIGS, a group of countries with emergent similarities that illustrates their poor economic performance, and Eurozone, the group of countries that adopted the Euro as their currency. The estimated values of the different models for the statistically significant variables are very similar. When comparing the different models estimated in Table 13, using the results in Table 14, we conclude using a statistical inference that the estimated model (E) is the preferable one. As it can be seen in Table 13, by the p-values reported for the White test and Jarque-Bera test, there is homoskedasticity and normality at 1% significance level, respectively. The correlation between the variables in the study is presented in Table 20 in Annex A.2.

The variables *Acquirer's M&A experience in target industry*, *Tobin's Q* and *Cross-border* are statistically significant at 5%, while the variables *Private*, *Pre-merger acquirer profitability*, *Eurozone* and *Eurozone $\times$ Recession* are statistically significant at 10%. The findings for the effects of the explanatory variables on *CARs* are consistent with the discussion presented in Section 2.

If the acquirer firm engages in one more acquisition, the *CARs'* estimate will increase by approximately 0.06 pp. The increase of one point of *Tobin's Q* ratio will result in an estimated increase of *CARs* of 1.982 pp. The effect of an acquirer's *Cross-border* acquisition against a domestic acquisition is smaller in 4.117 pp for the estimated *CARs*. The effect for the increase of one point for the *Acquirer's pre-merger profitability* in the *CARs* it will be a decrease of approximately 0.17 pp. The effect of the acquirer country belongs to *Eurozone* against a non-Eurozone country is higher in 4.051 pp for the estimated *CARs*. During periods of recession, countries of *Eurozone* present a decrease of around 5.9 pp in the estimated *CARs*, comparing with countries that do not belong to *Eurozone*.

The primary purpose of this study is to estimate the effect of the binary variable *Private* in the estimated *CARs*. Our results show that the effect of a private acquisition against a public acquisition is higher in 5.907 pp for the estimated *CARs*. Thus, research hypothesis 6 is not rejected.

Table 13 Estimates of acquirer choice model and performance model

Results of the estimation of		Acquirer Choice Model		Performance Model		
		(A)	(B)	(C)	(D)	(E)
<i>Private</i>		6.125** (3.011)	5.828*** (2.989)	5.748*** (3.098)	5.533*** (3.231)	5.907*** (3.152)
<i>Same industry</i>	0.215 (0.266)	1.817 (1.929)	1.924 (1.941)	1.915 (1.964)	1.550 (2.049)	1.956 (2.036)
<i>Acquirer M&A experience in target industry</i>	-0.008** (0.004)	0.065** (0.027)	0.066** (0.027)	0.067** (0.028)	0.063** (0.026)	0.058** (0.026)
<i>Target intangibles</i>	-0.433 (0.333)					
<i>Target age</i>	-0.007** (0.003)	-0.018 (0.028)	0.018 (0.028)	0.017 (0.029)	0.020 (0.029)	0.016 (0.028)
<i>All cash</i>	-1.660* (0.479)					
<i>All shares</i>	-1.607* (0.544)	2.381 (4.689)	2.048 (4.531)	2.193 (4.617)	2.225 (4.569)	1.158 (4.064)
Control variables						
<i>Investor protection</i>		1.208 (1.165)	1.288 (1.154)	1.281 (1.159)	1.484 (1.162)	1.506 (1.120)
<i>Tobin's Q</i>		2.116* (0.805)	2.148* (0.796)	2.153* (0.797)	2.113* (0.795)	1.982** (0.806)
<i>Target relative size</i>		-0.001 (0.018)	0.001 (0.018)	0.000 (0.018)	-0.001 (0.018)	-0.004 (0.019)
<i>Size</i>		-0.031 (0.284)	-0.062 (0.284)	-0.057 (0.288)	-0.049 (0.291)	-0.060 (0.291)
<i>Pre-merger acquirer profitability</i>		-0.183** (0.085)	-0.171** (0.085)	-0.172** (0.085)	-0.164*** (0.087)	-0.169*** (0.087)
<i>Cross-border</i>		-4.260** (1.916)	-4.249** (1.898)	-4.340** (1.935)	-4.202** (2.919)	-4.117** (1.927)

<i>PIIGS</i>			2.601 (2.421)	2.223 (3.221)		
<i>PIIGS × Recession</i>				1.519 (3.969)		
<i>Eurozone</i>					1.483 (2.002)	4.051*** (2.426)
<i>Euro zone × Recession</i>						-5.949*** (3.128)
<i>Correction for the endogeneity of target choice</i>		-0.610 (4.370)	-0.742 (4.352)	-0.898 (4.531)	-1.040 (4.699)	0.841 (4.749)
Constant	2.390* (0.620)	-15.252*** (7.710)	-15.702** (7.649)	-15.551** (7.656)	-16.749** (7.329)	-17.464** (7.449)
Sample size	155			137		
McFadden R²	0.197					
Adjusted R²		0.136	0.134	0.127	0.131	0.146
Log-likelihood	-65.447					
LR statistic	32.193					
p-value	(0.000)					
Wald F-statistic		5.656 (0.000)	5.058 (0.000)	4.753 (0.000)	5.123 (0.000)	4.301 (0.000)
White test		98.005 (0.177)	112.650 (0.165)	116.951 (0.133)	116.364 (0.112)	126.710 (0.162)
Jarque-Bera normality test		2.761 (0.251)	2.148 (0.342)	2.164 (0.339)	2.222 (0.329)	2.330 (0.312)

Note | Estimates of standard errors for the estimates of the regression coefficients in parentheses. For the acquirer's choice model, it was used the robust Huber-White estimator to produce the estimates of the standard errors. For the performance model, it was used the consistent estimator of Newey-West for heteroskedasticity and/or autocorrelation. *, **, *** significance at 1%, 5% and 10% level respectively.

Table 14 Comparison between estimated performance models

(A) and (B)	Wald-F Test	1.154
	P-value	(0.285)
(A) and (C)	Wald-F Test	1.924
	P-value	(0.150)
(A) and (D)	Wald-F Test	0.548
	P-value	(0.460)
(A) and (E)	Wald-F Test	2.503
	P-value	(0.086)

6. Conclusion

This dissertation studied the information-related issues that drive the acquirer's choice of a private target and the possibility of acquisitions of private and public targets generate different value for the acquirer.

The target selection is one of the key steps in an acquisition, so acquirers have to make strategic choices based on the expected performance of those targets. Akerlof (1978) states that information economics identify information asymmetry as a friction in factor markets that constrains the acquirer's choice of the target. The key difference between private and public firms is the quantity and quality of information available and there are several factors that drive the acquirer's propensity to buy a private rather than a public firm. Consequently, acquirer's returns are affected by the listing status of the target. There are several studies that find that acquirers have positive abnormal returns for acquisitions of private firms and negative ones for acquisitions of public firms. Once again, there are numerous explanations for the acquirer's higher returns when the target is a private firm.

Two different models were developed in order to achieve the goal of this dissertation, based on the Heckman's two-step method. The acquirer's choice model was estimated as a probit model, by maximum likelihood estimation. This is the first step of Heckman's method. The second step includes the lambda endogeneity bias control variable obtained from the acquirer's choice model. Lambda is incorporated to test the presence of endogeneity biases and to remove them. Therefore, unbiased estimators for the effects of target ownership on acquirer returns are obtained.

In the acquirer's choice model, the dependent variable is the binary variable *Private* that takes the value of one when the target is a private firm and zero when the target is a public firm. The regression provides a statistically significant relationship between the dependent variable and the independent variables, for a significance level of 1% and a McFadden R^2 value of 0.197 was obtained. The variables *All Shares*, *All Cash*, *Target age* and *Acquirer's M&A experience in target industry* are individually statistically significant. The first two at a significance level of 1% and the others at 5%. The four coefficient estimates are negative.

Concerning the performance model, due to the diversity of acquirer's countries of our sample, several models were estimated in order to capture potential differences by using additive and multiplicative dummies. When comparing the different models, we conclude using a

statistical inference that the estimated model (E) is the preferable one. The p-values reported for the White test and Jarque-Bera test, there are homoskedasticity and normality at 1% significance level, respectively. The variables *Acquirer's M&A experience in target industry*, *Tobin's Q* and *Cross-border* are statistically significant at 5%, while the variables *Private*, *Pre-merger acquirer profitability*, *Eurozone* and *Eurozone $\times$ Recession* are statistically significant at 10%. The findings for the effects of the explanatory variables on *CARs* are consistent with the discussion presented in Section 2.

The primary purpose of this study is to estimate the effect of the binary variable *Private* in the estimated *CARs*. Our results show that the effect of a private acquisition against a public acquisition is higher in 5.907 pp for the estimated *CARs*.

To sum up, the limitations of this research should not be disregarded. The main limitation is the sample size. Future research could include a larger sample and time period, in order to obtain a more reliable and broader set of results. Some new other variables could also be included. Hence, some of our control variables could be used not only as control variables. In a practical example, the control variable *Tobin's Q* could be related to the variable *Private* (e.g., *Private $\times$ Tobin's Q*), allowing not only the possibility to study the effect of *Private* in *CARs* but also the multiple effect of *Tobin's Q* in *Private* and, subsequently, in *CARs*. Thus, other econometrics methods could be used to address the problem of endogeneity. The problem could be controlled by using instrumental variables or modelling the issue as a simultaneous equations model.

References

Articles

- Agrawal, A., Jaffe, J. F., & Mandelker, G. N. (1992). The post-merger performance of acquiring firms: a re-examination of an anomaly. *The Journal of Finance*, 47(4), 1605-1621.
- Akerlof, G. A. (1978). The market for “lemons”: Quality uncertainty and the market mechanism *Uncertainty in Economics* (pp. 235-251): Elsevier.
- Alexandridis, G., Petmezas, D., & Travlos, N. G. (2010). Gains from mergers and acquisitions around the world: New evidence. *Financial management*, 39(4), 1671-1695.
- Andrade, G., Mitchell, M., & Stafford, E. (2001). New evidence and perspectives on mergers. *Journal of economic perspectives*, 15(2), 103-120.
- André, P., & Ben-Amar, W. (2009). Control Threat and Means of Payment: Evidence from Canadian Mergers and Acquisitions.
- Ang, J., & Kohers, N. (2001). The take-over market for privately held companies: the US experience. *Cambridge Journal of Economics*, 25(6), 723-748.
- Arikan, I. (2004). In the market for firms, how should a firm be sold? *Advances in mergers and acquisitions* (pp. 181-208): Emerald Group Publishing Limited.
- Asquith, P., Bruner, R. F., & Mullins Jr, D. W. (1983). The gains to bidding firms from merger. *Journal of financial economics*, 11(1-4), 121-139.
- Balakrishnan, S., & Koza, M. P. (1993). Information asymmetry, adverse selection and joint-ventures: Theory and evidence. *Journal of economic behavior & organization*, 20(1), 99-117.
- Bargeron, L. L., Schlingemann, F. P., Stulz, R. M., & Zutter, C. J. (2008). Why do private acquirers pay so little compared to public acquirers? *Journal of financial economics*, 89(3), 375-390.
- Becchetti, L., & Trovato, G. (2002). The determinants of growth for small and medium sized firms. The role of the availability of external finance. *Small Business Economics*, 19(4), 291-306.
- Berkovitch, E., & Narayanan, M. (1990). Competition and the medium of exchange in takeovers. *The Review of Financial Studies*, 3(2), 153-174.
- Bertrand, O., & Betschinger, M.-A. (2012). Performance of domestic and cross-border acquisitions: Empirical evidence from Russian acquirers. *Journal of Comparative*

- Economics*, 40(3), 413-437.
- Bjorvatn, K. (2004). Economic integration and the profitability of cross-border mergers and acquisitions. *European Economic Review*, 48(6), 1211-1226.
- Blanco, J. (2001). The euro as an opportunity for value creation. *Managerial Finance*, 27(9), 41-53.
- Bradley, M., Desai, A., & Kim, E. H. (1983). The rationale behind interfirm tender offers: Information or synergy? *Journal of financial economics*, 11(1-4), 183-206.
- Campa, J. M., & Hernando, I. (2004). Shareholder value creation in European M&As. *European Financial Management*, 10(1), 47-81.
- Capron, L., & Shen, J. C. (2007). Acquisitions of private vs. public firms: Private information, target selection, and acquirer returns. *Strategic management journal*, 28(9), 891-911.
- Chang, S. (1998). Takeovers of privately held targets, methods of payment, and bidder returns. *The Journal of Finance*, 53(2), 773-784.
- Chatterjee, S. (1986). Types of synergy and economic value: The impact of acquisitions on merging and rival firms. *Strategic management journal*, 7(2), 119-139.
- Chen, C., & Findlay, C. (2003). A Review of Cross-border Mergers and Acquisitions in APEC. *Asian-Pacific Economic Literature*, 17(2), 14-38.
- Coeurdacier, N., De Santis, R. A., & Aviat, A. (2009). Cross-border mergers and acquisitions and European integration. *Economic Policy*, 24(57), 56-106.
- Conn, R. L., Cosh, A., Guest, P. M., & Hughes, A. (2005). The impact on UK acquirers of domestic, cross-border, public and private acquisitions. *Journal of Business Finance & Accounting*, 32(5-6), 815-870.
- de La Bruslerie, H. (2013). Crossing takeover premiums and mix of payment: An empirical test of contractual setting in M&A transactions. *Journal of Banking & Finance*, 37(6), 2106-2123.
- Deeds, D. L., DeCarolis, D., & Coombs, J. (2000). Dynamic capabilities and new product development in high technology ventures: An empirical analysis of new biotechnology firms. *Journal of Business venturing*, 15(3), 211-229.
- DePamphilis, D. (2009). *Mergers, acquisitions, and other restructuring activities: An integrated approach to process, tools, cases, and solutions*: Academic Press.
- Eckbo, B. E. (2009). Bidding strategies and takeover premiums: A review. *Journal of Corporate Finance*, 15(1), 149-178.
- Eckbo, B. E., Maksimovic, V., & Williams, J. (1990). Consistent estimation of cross-sectional

- models in event studies. *The Review of Financial Studies*, 3(3), 343-365.
- Ekkayokkaya, M., Holmes, P., & Paudyal, K. (2009). The Euro and the changing face of European banking: evidence from mergers and acquisitions. *European Financial Management*, 15(2), 451-476.
- Faccio, M., & Masulis, R. W. (2005). The choice of payment method in European mergers and acquisitions. *The Journal of Finance*, 60(3), 1345-1388.
- Faccio, M., McConnell, J. J., & Stolin, D. (2006). Returns to acquirers of listed and unlisted targets. *Journal of Financial and Quantitative Analysis*, 41(1), 197-220.
- Fama, E. F., Fisher, L., Jensen, M. C., & Roll, R. (1969). The adjustment of stock prices to new information. *International economic review*, 10(1), 1-21.
- Fishman, M. J. (1989). Preemptive bidding and the role of the medium of exchange in acquisitions. *The Journal of Finance*, 44(1), 41-57.
- Franks, J., & Mayer, C. (1990). Capital markets and corporate control: a study of France, Germany and the UK. *Economic policy*, 5(10), 189-231.
- Fuller, K., Netter, J., & Stegemoller, M. (2002). What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions. *The Journal of Finance*, 57(4), 1763-1793.
- Goergen, M., & Renneboog, L. (2004). Shareholder wealth effects of European domestic and cross-border takeover bids. *European Financial Management*, 10(1), 9-45.
- Hansen, R. G., & Lott, J. R. (1996). Externalities and corporate objectives in a world with diversified shareholder/consumers. *Journal of Financial and Quantitative Analysis*, 31(1), 43-68.
- Harford, J. (2005). What drives merger waves? *Journal of financial economics*, 77(3), 529-560.
- Heckman, J. J. (1977). Sample selection bias as a specification error (with an application to the estimation of labor supply functions): National Bureau of Economic Research Cambridge, Mass., USA.
- Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica: Journal of the econometric society*, 153-161.
- Henderson, A. D. (1999). Firm strategy and age dependence: A contingent view of the liabilities of newness, adolescence, and obsolescence. *Administrative Science Quarterly*, 44(2), 281-314.
- Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American economic review*, 76(2), 323-329.

- John, K., Freund, S., Nguyen, D., & Vasudevan, G. K. (2010). Investor protection and cross-border acquisitions of private and public targets. *Journal of Corporate Finance*, 16(3), 259-275.
- Königs, A., & Schiereck, D. (2008). Combined in Luxury: M&A Announcement Effects and Capital Market Integration in Europe. *ICFAI Journal of Mergers & Acquisitions*, 5(1).
- Kooli, M., Kortas, M., & L'her, J.-F. (2003). A new examination of the private company discount: The acquisition approach. *The Journal of Private Equity*, 6(3), 48-55.
- Lang, L. H., Stulz, R., & Walkling, R. A. (1989). Managerial performance, Tobin's Q, and the gains from successful tender offers. *Journal of financial economics*, 24(1), 137-154.
- Loderer, C., & Martin, K. (1990). Corporate acquisitions by listed firms: The experience of a comprehensive sample. *Financial management*, 17-33.
- Lynch, J. G., & Lind, B. (2002). Escaping merger and acquisition madness. *Strategy & Leadership*, 30(2), 5-12.
- Maddala, G. S. (1986). *Limited-dependent and qualitative variables in econometrics*: Cambridge university press.
- Manchin, M. (2004). *Determinants of European cross-border mergers and acquisitions*. Retrieved from
- Martin, K. J. (1996). The method of payment in corporate acquisitions, investment opportunities, and management ownership. *The Journal of Finance*, 51(4), 1227-1246.
- Martynova, M., & Renneboog, L. (2006). Mergers and acquisitions in Europe. *Advances in corporate finance and asset pricing*, 13-75.
- McCarthy, K. J., & Dolfsma, W. (2015). The Euro and its impact on the number, size, performance and regional spread of European mergers and acquisitions. *Regional Studies*, 49(8), 1407-1422.
- Mitchell, M. L., & Mulherin, J. H. (1996). The impact of industry shocks on takeover and restructuring activity. *Journal of financial economics*, 41(2), 193-229.
- Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2004). Firm size and the gains from acquisitions. *Journal of financial economics*, 73(2), 201-228.
- Moschieri, C., & Campa, J. M. (2009). The European M&A industry: A market in the process of construction. *Academy of Management Perspectives*, 23(4), 71-87.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, 13(2), 187-221.
- Nicholson, R. R., & Salaber, J. (2014). The impact of the financial crisis on the performance

- of European acquisitions *International business and institutions after the financial crisis* (pp. 73-92): Springer.
- Officer, M. S. (2007). The price of corporate liquidity: Acquisition discounts for unlisted targets. *Journal of financial economics*, 83(3), 571-598.
- Officer, M. S., Poulsen, A. B., & Stegemoller, M. (2008). Target-firm information asymmetry and acquirer returns. *Review of Finance*, 13(3), 467-493.
- Persons, J. C., & Warther, V. A. (1997). Boom and bust patterns in the adoption of financial innovations. *The Review of Financial Studies*, 10(4), 939-967.
- Reuer, J. J., & Ragozzino, R. (2008). Adverse selection and M&A design: The roles of alliances and IPOs. *Journal of Economic Behavior & Organization*, 66(2), 195-212.
- Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of business*, 197-216.
- Sanders, W. G., & Boivie, S. (2004). Sorting things out: Valuation of new firms in uncertain markets. *Strategic Management Journal*, 25(2), 167-186.
- Schwert, G. W. (2000). Hostility in takeovers: in the eyes of the beholder? *The Journal of Finance*, 55(6), 2599-2640.
- Shaver, J. M. (1998). Accounting for endogeneity when assessing strategy performance: does entry mode choice affect FDI survival? *Management Science*, 44(4), 571-585.
- Shen, J.-C., & Reuer, J. J. (2005). Adverse selection in acquisitions of small manufacturing firms: A comparison of private and public targets. *Small Business Economics*, 24(4), 393-407.
- Singh, H., & Montgomery, C. A. (1987). Corporate acquisition strategies and economic performance. *Strategic Management Journal*, 8(4), 377-386.
- Sudarsanam, S. (2003). *Creating value from mergers and acquisitions: The challenges: An integrated and international perspective*: Pearson Education.

Websites

<https://www.statista.com/topics/3339/mergers-and-acquisitions-in-europe/>

<https://www.investopedia.com/ask/answers/difference-between-publicly-and-private-held-companies/>

<https://corporatefinanceinstitute.com/resources/knowledge/finance/private-vs-public-company/>

<https://www.ft.com/content/b7e67ba4-c28f-11e8-95b1-d36dfef1b89a?fbclid=IwAR0gcIIIsDbu0iZjJBKoTcUeNGVB8qXtnkXi-SuB6eOoSp8xgVqKqSA3vGF9yI>

<https://www.jpmpdf.com/jpmpdf/1320746694177.pdf?fbclid=IwAR3M63dwBWs87LWIqvCXJ7A0Zb46e1TJfYtXtOVq6KtTRhJWb15tuSWJac>

https://imaa-institute.org/mergers-and-acquisitions-statistics/?fbclid=IwAR2ERKk_hSUGu5CW58KEvqqykbL0aUrrAp-msQR0yw3NBDwfl5o69d-3nCuU

Annexes

Annex A.1

Table 15 Theories of acquirer's size effect

Hubris hypothesis	
Roll (1986)	Managers are driven by overconfidence. Managers overpay due to managerial hubris and, therefore, only the target company benefits from the transaction. The transaction is a zero net present value transaction, which means that the gain of the target firm is similar to the loss of the acquiring firm.
Herding phenomenon	
Persons and Warther (1997)	Firms engage in a merger or acquisition as a reaction on a successful merger or acquisition by their competitors. These firms react to their competitors and do not use economic reasons, which results in value-destroying mergers or acquisitions.
Free cash flow hypothesis	
Jensen (1986)	Management controls the utilization of the firm's free cash flow. If the company has a large amount of free cash flow, stockholders push the management to pay out this massive amount of free cash flow. Although, rather than paying out the free cash flows to stockholders, managers with large amounts of free cash flow are more likely to invest in zero net present value or even value-destroying mergers or acquisitions.

Annex A.2

Table 16 Country's denominations

Country Code	Country
BE	Belgium
CH	Switzerland
DE	Germany
DK	Denmark
ES	Spain
FI	Finland
FR	France
GB	United Kingdom
IE	Ireland
IT	Italy
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RU	Russian Federation
SE	Sweden
SI	Slovenia
TR	Turkey

Table 17 Descriptive statistics for all acquisitions

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
<i>Acquirer M&A experience in the target industry</i>	8.292	3.000	323.000	0.000	28.833	10.143	110.909
<i>All cash</i>	0.531	1.000	1.000	0.000	0.501	-0.123	1.015
<i>All shares</i>	0.100	0.000	1.000	0.000	0.301	2.667	8.111
<i>Acquirer's pre-merger profitability</i>	5.719	4.232	59.487	-15.519	9.208	2.038	11.711
<i>Cross-border</i>	0.300	0.000	1.000	0.000	0.460	0.873	1.762
<i>Eurozone</i>	0.354	0.000	1.000	0.000	0.480	0.611	1.374
<i>Investor protection</i>	6.535	6.300	8.000	4.700	0.983	0.199	1.917
<i>PIIGS</i>	0.131	0.000	1.000	0.000	0.338	2.190	5.798
<i>Same industry</i>	0.615	1.000	1.000	0.000	0.488	-0.474	1.225
<i>Acquirer's size</i>	7.789	6.197	17.685	3.795	3.789	1.152	2.932
<i>Target age</i>	36.131	23.000	186.000	2.000	37.717	2.179	7.220
<i>Tobin's Q</i>	1.651	1.297	21.611	0.049	2.061	7.321	69.394
<i>Target relative size to the acquirer</i>	27.800	9.084	335.352	0.020	43.759	3.447	20.836

Regarding *Tobin's Q*, the values obtained are between 0.05 and 22. With a mean of 1.7, we can state that acquirer's assets are overvalued. Theoretically, having Tobin's Q higher than one implies that the firm's stock is more expensive than the replacement costs of its assets, which indicates that the stock is overvalued.

Concerning to *Acquirer's pre-merger profitability*, the values obtained are between -15.519 and 59.847, having a mean of 5.719. The ratio EBIT/Total Assets allows the firm to see the relationship between its resources and its income, providing a point of comparison to determine if the firm is using its assets more or less useful than previously. This ratio can be expressed as a percentage or decimal and provides insight into how much money is generated from each euro invested into the firm.

Looking at the variable *Cross-border*, 30% of the acquisitions of our sample were done between firms of different countries, representing 39 out of 130 acquisitions. The same analysis can be done for all dummy variables.

Table 18 Descriptive statistics for acquisitions of public firms

Variables	Mean	Median	Maximum	Minimum	Std.Dev.	Skewness	Kurtosis
<i>Acquirer's M&A experience in target industry</i>	19.304	4.000	323.000	0.000	66.413	4.432	20.782
<i>All cash</i>	0.957	1.000	1.000	0.000	0.209	-4.477	21.045
<i>All shares</i>	0.043	0.000	1.000	0.000	0.209	4.477	21.045
<i>Acquirer's pre-merger profitability</i>	3.949	3.265	11.340	-12.225	5.436	-0.831	4.456
<i>Cross-border</i>	0.304	0.000	1.000	0.000	0.470	0.850	1.723
<i>Eurozone</i>	0.261	0.000	1.000	0.000	0.449	1.089	2.186
<i>Investor protection</i>	6.000	6.000	7.000	4.700	0.455	-1.011	5.466
<i>PIIGS</i>	0.043	0.000	1.000	0.000	0.209	4.477	21.045
<i>Same industry</i>	0.609	1.000	1.000	0.000	0.499	-0.445	1.198
<i>Acquirer's size</i>	6.504	5.435	16.112	3.795	3.539	1.757	4.955
<i>Target age</i>	42.739	27.000	162.000	11.000	37.674	1.883	5.889
<i>Tobin's Q</i>	2.006	1.042	21.611	0.049	4.320	4.323	20.170
<i>Target relative size</i>	55.317	45.825	122.621	0.020	48.699	0.273	1.442

Table 19 Descriptive statistics for acquisitions of private firms

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
<i>Acquirer's M&A experience in target industry</i>	5.925	3.000	43.000	0.000	8.021	2.254	8.678
<i>All cash</i>	0.439	0.000	1.000	0.000	0.499	0.245	1.060
<i>All shares</i>	0.112	0.000	1.000	0.000	0.317	2.458	7.043
<i>Acquirer's pre-merger profitability</i>	6.099	4.239	59.487	-15.519	9.809	2.001	10.645
<i>Cross-border</i>	0.299	0.000	1.000	0.000	0.460	0.878	1.770
<i>Eurozone</i>	0.374	0.000	1.000	0.000	0.486	0.522	1.272
<i>Investor protection</i>	6.650	6.300	8.000	4.700	1.028	-0.015	1.719
<i>PIIGS</i>	0.150	0.000	1.000	0.000	0.358	1.966	4.863
<i>Same industry</i>	0.617	1.000	1.000	0.000	0.488	-0.481	1.231
<i>Acquirer's size</i>	8.066	6.344	17.685	4.549	3.799	1.075	2.707
<i>Target age</i>	34.710	22.000	186.000	2.000	37.751	2.269	7.626
<i>Tobin's Q</i>	1.575	1.330	7.255	0.274	1.124	2.208	9.648

<i>Target relative size</i>	21.885	8.234	335.352	0.032	40.479	4.967	35.719
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The analysis done regarding Table 17 can also be done for both Table 18 and Table 19. In this case, these tables present the descriptive statistics for acquisitions of public and private firms, respectively.

Table 20 Independent variables correlations of Performance Model

	EXP	CASH	SHARES	PROF	CROSS	IP	EURO	PIIGS	SI	SZ	AGE	TOB	TRS
EXP	1.000	0.084	-0.019	0.004	0.175	-0.015	0.116	-0.026	0.366	-0.080	-0.052	0.063	-0.087
CASH	-0.084	1.000	-0.315	0.039	0.162	0.080	0.062	-0.001	0.000	-0.051	-0.134	0.124	-0.173
SHARES	-0.018	-0.315	1.000	-0.045	-0.103	-0.084	0.154	0.183	-0.085	0.038	0.082	-0.163	0.101
PROF	0.004	0.039	-0.045	1.000	-0.029	0.146	-0.235	-0.158	0.153	0.031	-0.100	0.282	0.078
CROSS	0.175	0.162	-0.103	-0.029	1.000	-0.182	-0.041	-0.045	0.137	-0.210	-0.168	0.251	0.051
IP	-0.015	0.080	-0.084	0.146	-0.182	1.000	-0.440	0.136	0.090	0.006	0.052	0.030	-0.114
EURO	0.116	0.062	0.154	-0.235	-0.041	-0.440	1.000	0.489	0.053	0.064	-0.035	-0.079	0.206
PIIGS	-0.026	-0.001	0.183	-0.158	-0.045	-0.136	0.489	1.000	-0.101	0.122	0.087	-0.169	0.028
SI	0.366	0.000	-0.085	0.153	0.137	0.090	0.053	-0.101	1.000	-0.108	0.036	0.267	0.021
SZ	-0.080	-0.051	0.038	0.031	-0.210	0.006	0.064	0.122	-0.108	1.000	0.144	0.009	0.051
AGE	-0.052	-0.134	0.082	-0.100	-0.168	0.052	-0.035	0.087	0.036	0.144	1.000	-0.115	0.113
TOB	0.063	0.124	-0.163	0.282	0.251	0.030	-0.079	-0.169	0.267	0.009	-0.115	1.000	-0.063
TRS	-0.087	-0.173	0.101	0.078	0.051	-0.114	0.206	0.028	0.021	0.051	0.113	-0.063	1.000

Notes | The variables denomination corresponds to: EXP – Acquirer’s M&A experience in the target’s industry; Cash – All cash; Shares – All shares; PROF – Acquirer’s pre-merger profitability; CROSS – Cross-border; IP – Investor protection; EURO – Euro Zone; PIIGS – PIIGS; SI – Same industry; SIZE – Acquirer’s size; AGE – Target age; TOBI – Tobin’s Q; TRS – Target relative size.

Table 21 Variable definitions summary

Variable	Definition	Source
<i>Private</i>	Dummy variable that takes the value of 1 if the target is a private firm and 0 if the target is a public firm.	Zephyr Database
<i>All shares</i>	Dummy variable that takes the value of 1 if the deal is a 100% shares deal and 0 otherwise.	Zephyr Database
<i>All cash</i>	Dummy variable that takes the value of 1 if the deal is a 100% cash deal and 0 otherwise.	Zephyr Database
<i>Cross-border</i>	Dummy variable that takes the value of 1 if the acquirer country and the target country are not the same (i.e. cross-border deal) and 0 if the acquirer country and the target country are the same (i.e. domestic deal).	Zephyr Database
<i>Same industry</i>	Dummy variable that takes the value of 1 if the acquirer and the target are in the same industry and 0 otherwise. According to the “Major sector” description in the database.	Zephyr Database
<i>Size</i>	The natural logarithm of the acquirer’s market capitalization.	Zephyr Database
<i>Target intangibles</i>	Dummy variable that takes the value of 1 when the target is in a high-tech industry and 0 otherwise. ⁶	Zephyr Database
<i>Target age</i>	The target age.	Amadeus Database
<i>Acquirer M&A experience in the target industry</i>	The number of previous acquisitions made by the acquirer before the focal transaction in the target's industry.	Zephyr Database
<i>Tobin’s Q</i>	The sum of market capitalization and total liabilities (debt proxy) divided by total assets.	Zephyr Database

⁶ As high-tech industries, we consider the following ones: industrial, electric and electronic machinery; computer hardware; computer software and biotechnology and life sciences.

<i>Investor protection</i>	An investor protection index is a number between 0 and 10 and an average of three indices ⁷ , where 0 is the lowest investor protection and 10 is the highest investor protection.	World Bank
<i>Target relative size</i>	The relative proportion of the target's assets to the acquirer's assets.	Zephyr Database
<i>Pre-merger acquirer profitability</i>	Measured using EBIT/Total Assets.	Zephyr Database
<i>PIIGS</i>	An acronym used to denote a group of countries with emergent similarities, composed by Portugal, Italy, Ireland, Greece and Spain. Illustrates the poor economic performance of these countries.	
<i>Eurozone</i>	Countries that belong to the Eurozone ⁸ .	European Central Bank
<i>Recession</i>	Periods of recession by country.	Federal Reserve Bank of St. Louis

Table 22 Periods of recession by country⁹

Country	Period of recession
Belgium	June 2001 – March 2013 December 2017 – Nowadays
Denmark	April 2011 – February 2014 February 2017 – Nowadays
Finland	December 2011 – March 2015 February 2018 – Nowadays
France	October 2011 – February 2013 October 2014 – August 2016 January 2018 – Nowadays

⁷ The extent of disclosure index, the extent of director liability index and the ease of shareholder suit index.

⁸ The countries that belong to Euro Zone are the following ones: Germany, Belgium, Slovenia, Spain, Finland, France, Italy, Netherlands and Portugal.

⁹ Derived from Federal Reserve Bank of St. Louis.

Germany	July 2011 – March 2013 February 2014 – July 2015 November 2017 – Nowadays
Ireland	November 2010 – April 2013 July 2015 – April 2017
Italy	June 2011 – April 2013 January 2018 – Nowadays
Netherlands	March 2011 – April 2013 April 2015 – December 2015 March 2018 – Nowadays
Norway	January 2010 – August 2010 April 2012 – January 2014 August 2015 – August 2016 August 2017 – Nowadays
Poland	November 2011 – November 2013 October 2015 – July 2016 September 2018 – Nowadays
Portugal	November 2010 – December 2012 March 2018 – Nowadays
Romania	July 2011 – July 2013 October 2015 – October 2016
Russia	October 2013 – March 2016 August 2018 – Nowadays
Slovenia	June 2011 – February 2013 September 2014 – November 2015 January 2018 – Nowadays
Spain	March 2011 – July 2013 September 2017 – Nowadays
Sweden	March 2011 – July 2013 December 2015 – January 2017
Switzerland	April 2011 – December 2012 November 2014 – February 2017 March 2018 – Nowadays

Turkey	August 2011 – July 2012
	November 2014 – February 2017
	March 2018 – Nowadays
United Kingdom	December 2014 – March 2018