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Master Thesis [Financial Economics]

Title

Premium and performance differences between US single
and serial acquirers

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ABSTRACT

This thesis examines the differences in acquisition premiums and cumulative abnormal returns (CARs) between single and serial US acquirers, from a real options value perspective. It acknowledges differences on the value of growth options embedded to the targets, between single and serial acquirers, which justifies payment of higher premiums in serial acquisition strategies. The data sample consists of 661 deals, 308 conducted by 122 serial acquirers and 353 by single acquirers, between 2010 and 2019. Controlling for deal characteristics and acquirer-level variables, the empirical results show that serial acquirers pay on average 10.5 percent higher acquisition premiums compared to single acquirers, but robust conclusions about the performance (CARs) of serial and single acquirers cannot be drawn.

Keywords: Acquisition premiums, mergers and acquisitions, cumulative abnormal returns, serial acquirers, single acquirers

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1. Introduction

Mergers and acquisitions are a very actively researched topic in finance literature (Mitchell & Mulherin,1996; Maksimovic and Phillips,2001, Harford,2005; Rhodes–Kropf, Robinson and Viswanathan,2005; Laamanen,2007). Acquisitions are usually a valuable instrument for companies to grow externally, because they may generate synergies by increasing market share, achieving economies of scale and expanding geographically or to new industries, among some reasons.

In the past decade, two-thirds of the \$16 trillion in aggregate acquisition value around the world were induced by companies that are serial acquirers.¹ One in five public acquirers is a serial acquirer (Karolyi, G. A., Liao, R. C. and Loureiro,2015). These serial acquirers not only acquire targets in their own industry and country, but also engage in cross-border and inter-industry deals. Some of the world’s largest firms, such as Vodafone, IBM, Microsoft and Google, are active acquirers who have applied serial acquisition strategies to manage remarkable growth and global expansion gradually.

Premiums are of interest to research, not just as explanation of payments and acquirers’ expectations about growth potential, but because they finally influence the acquirers’ returns. *Ceteris paribus*, it is self-evident that the higher the premium paid, the lower the abnormal returns and potential net benefits from synergies to the acquirer from a specific acquisition.

Serial acquirers can be differentiated from other acquirers by how they acknowledge growth potential obtained in early deals towards successful execution of the serial acquisition strategy (Smit,2001). By following a real options perspective, this paper provides a theoretical categorization between serial and single acquirers, based on the growth option value differences embedded in the target firms. Furthermore, differences exist if acquisitions are single deals or serve as a platform that creates consecutive opportunities for growth beyond the initial deal (serial acquisition programs) and deals with uncertainty in new environments (Smit, 2001; Smit and Moraitis,2010). Consequently, deals that are part of serial strategies justify payment of higher premiums

¹ Serial acquirers are defined as companies that conduct at least two acquisitions within a timeframe of five years. It is similar in spirit to the definition in Aktas, De Bodt and Roll (2013) and in Billett and Qian (2008), who denote serial acquirers as those that acquire two or more targets over the entire sample period or over a five-year window.

(Smit,2001), where the premiums serve as a viewpoint of an acquisition's value (Hayward and Hambrick,1997).

A large empirical literature has documented that acquirers experience positive abnormal returns when they relocate their own resources to the target (Capron and Pistre,2002) or even significant negative abnormal returns due to the poor post-acquisition underperformance of the targets and the extrapolations of acquirers' past performance (Agrawal, Jaffe, and Mandelker,1992; Loughran and Vjih,1997; Rau and Vermaelen,1998). However, US research that compares the performance of single and serial acquirers is scarce (Ismail, 2008).

This study attempts to fill the gap and extend the relevant literature by evaluating two research questions. The first one is whether single or serial acquirers pay higher premiums, considering the growth potential of their evaluating targets. The second question relates the difference in the cumulative abnormal returns between single and serial acquirers, considering also the level of the acquisition premium. A sample of 476 deals, consisting of 84 serial acquirers who engage in 207 deals and 269 single acquirers whose first acquisition was not followed by a second one within 5 years, is used. These deals are conducted by US acquirers that acquired 100% of the targets' shares in the period between January 2010 and December 2019.

This study finds that serial acquirers, compared to single acquirers, pay on average 10.5 percent higher acquisition premiums for public deals, after controlling for deal and acquirer-level characteristics. The results are not significant when controlling for deal, acquirer- and target-level characteristics. The difference in CARs between serial and single acquirers is zero when controlling for deal characteristics and acquirer's leverage, meaning that no acquirer earns higher abnormal returns for their shareholders, although the results are statistically insignificant. Moreover, this paper verifies a real options perspective that explains value differences between single and serial acquirers when acquiring a target, and provides an addition to the serial acquisition literature, by examining simultaneously the difference between single and serial acquirers in acquisition premiums, as well as in their cumulative abnormal returns and if there is causality between these two differences.

The rest of the paper is organized as follows. Section II briefly reviews the current literature and expands on the research hypotheses of this study. Section III describes the

sample and data used in this paper, as well as the applying methodology. Section IV presents the empirical results and the analyses. Section V contains the summary and conclusions.

2. Literature Review

With the onset of globalization, the notion that acquisitions occur in waves (Harford,2005), and improved levels of competition and technological disruption, the M&A activity and deal volume have reached extraordinary levels. The mergers and acquisitions (M&A) wave of the 1990s involved a mass of companies acquiring targets with which they often share substantial similarities (Carey,2000). At the same time, this wave was mainly described by the huge capital spent by different acquirers. Since 2000, more than 790,000 transactions have been announced worldwide with a known value of \$57 trillion.²

Acquisitions can result from various reasons, such as synergy motives (Hitt, Harrison and Ireland,2001), executives' willingness to maximize their personal wealth to the detriment of firms' shareholders (Trautwein,1990) and managerial hubris or opportunism (Haunschild,1994; Slusky and Caves,1991; Varaiaya and Ferris,1987). The acquiring firms attempt to deal with their own growth-resource discrepancy by obtaining firms with complementary financial characteristics (Camerlynck, Ooghe and De Langhe,2005).

It is crucial to realize that the objectives of an acquisition will differ between single and serial acquirers. The acquisition of a single acquirer usually can be viewed as an infrequent event, whereas serial acquirers will presumably search for external growth opportunities (Ooghe, De Langhe and Camerlynck,2006). Serial acquisitions, which mean a sequence of acquisitions, have received research attention (Schipper and Thompson,1983; Malatesta and Thompson,1985; Hayward,2002; Klasa and Stegemoller,2007; Barkema and Schijven,2008), either by examining the multiple acquisitions performed on the firm-level (Fuller, Netter and Stegemoller,2002; Laamanen and Keil,2008), or on the executives' level (Billet and Qian,2008; Malmendier and Tate,2008). A serial acquisition strategy can be conducted after time-varying changes in acquirer's growth opportunities (Klasa and Stegemoller,2007), or after periods of inert acquisition activity in an industry (Aktas, Bodt and Roll,2013). Serial acquirers often foresee growth opportunities beyond the initial deal compared to single acquirers, explaining the payment of a higher premium (Smit, 2001). This focus on growth options can be further explained using a real options lens.

² The volume of the transactions and the corresponding value are obtained from the Institute for Mergers, Acquisitions and Alliances (IMMA) for the period 2010-2019.

2.1 A real options classification of acquisitions

Real options logic is usually based on call-option characteristics, i.e. purchasing a minority stake in a company now to gain the right to exercise a full scale acquisition in the future, once uncertainty about the success of the first stage of consolidation is resolved (Dixit and Pindyck,1994; Smit,2001; Smit and Moraitis,2010). In line with this reasoning, targets have embedded growth options and could create a new path of follow-on investment opportunities to the acquirer, thereby serving as a platform (Smith and Triantis,1995; Smit,2001).

Acquisitions can be classified as either simple or compound options (Smit,2001), depending on whether they are segment of a serial acquisition strategy.

2.1.1 Simple acquisition options

From a real option perspective, acquisitions that do not provide further investment opportunities and generate only cash inflows are labeled simple acquisition options (Smit,2001). The value characteristics come from the simple option to defer rather than grow (Folta and O'Brien,2004). The acquirer can obtain expected synergies with the target through the timing (e.g. rise in products' demand) of asset purchases or become more efficient through layoffs, consolidation, and disinvestment (Lambrecht and Myers, 2007).

2.1.2 Compound acquisition options

Acquisitions are not considered as isolated deals, but rather as a sequence of two or more interrelated investment opportunities, which generate compound option value (Smit, 2001). Serial acquisitions entail higher growth option values than simple acquisition options, as they are options on options. The acquirer initially obtains one or more platforms in a new industry or geographic region and then leverages its new competencies and knowledge into follow-on acquisitions (Smit and Moraitis,2010).

There is sometimes confusion between the terms of 'serial acquisition' and 'buy-and-build acquisition' and whether these are identical or not. Previous literature stated that a buy-and-build strategy is a type of serial acquisition strategy that creates value through aimed industry consolidation in the long run (Smit,2001). In order to be effective, buy-and build acquisitions require specific industry, platform and financing conditions (Bansraj and Smit,2017). Serial acquisitions in this paper refer to companies that conduct at least two acquisitions within a timeframe of five years (Aktas, De Bodt and Roll,2013; Billett and Qian,2008).

Although extended literature on real options refers to the acquisition of a platform company, which serves as a target for the dawning of a serial acquisition strategy, and so the synergistic value stems from the target's resources, the acquiring firm can also act as a platform. The compound growth options then derive from internal factors in the acquirer level, for example through its accumulation of knowledge, resources and unique assets (Barney,1988; Capron and Pistre,2002), which increase the heterogeneity within the industry over competitors that may lack core capabilities and have limited internal resources (Peteraf,1993; Barnett,2008). If the acquirer itself serves as a platform, subsequent follow-on acquisitions could add to its growth option value and justify a premium over single acquisitions. Successful serial acquirers leverage their broad resource capabilities onto newly acquired targets, in order to achieve growth option value.

Apart from the internal factors of the acquirer, there are also external factors that create growth option value due to competitive advantages. For example, capturing a larger market share as the consolidated company grows with each acquisition by preempting rivals' growth is one of the key external drivers of synergies that are based on a timing advantage (Smit, 2001).

2.2 Performance differences between serial and single acquirers

Preceding research on M&A performance and the view of the market on the value creation and the premiums paid has primarily centered on stock returns surrounding the acquisition announcement and completion dates (cumulative abnormal returns or CARs).

2.2.1 Negative CARs and premiums

There is a big strand of previous literature that has documented significant negative abnormal returns to the acquirers' shareholders and positive returns to the targets' shareholders up to five years after the completion date (Asquith,1983; Malatesta,1983; Ruback and Jensen,1983; Magenheina and Mueller,1988; Agrawal, Jaffe, and Mandelker,1992; Loughran and Vjih,1997; Rau and Vermaelen,1998).

An explanation for the negative abnormal returns of the bidders lies to the acquisition premium, which is considered as an overpayment that absorbs part of the synergistic value that would need to be achieved in order for the acquired company to preserve its market value (Sirower,1997). Acquisition premium has been connected to low-quality decision making and low post-performance (Sirower,1995; Beckman and Haunschild,2002). There are many factors that can be incorporated to premiums, such as demand and supply conditions and relative valuations that lead to overpayment (Slusky and Caves,1991; Shleifer and Vishny,2003; Jahera, Hand and Lloyd,1985; Shelton,2000). Furthermore, when there are multiple bidders for the same target that is not core-related to the acquirer, the competition is rising, so the premium will increase, leading to negative abnormal returns (Flanagan and O'Shaughnessy,2003). Other studies show that recent overperformance and organizational success can result in managerial hubris (Hayward and Hambrick,1997; Daniel, Hirshleifer and Subrahmanyam,1998; Heaton,2002; Malmendier and Tate,2008), which might lead to irrational bid premiums and value-destroying acquisitions (Roll,1986). Additionally, companies with superior operating performance would probably have empire-building motives, causing again higher premiums and negative abnormal returns (Harford,1999).

2.2.2 Positive CARs and premiums

Despite the empirical evidence which shows that usually, targets' shareholders experience positive abnormal returns, acquirers also earn abnormal returns when they have their own unique resources, and which they leverage on to the target (Capron and Pistre,2002). So, the resource contribution of the acquirer to the target is vital for the outcome of the returns. If the expected synergies from the acquisition are embedded the target and its resources, then bidders will have zero returns. This stems from the fact that

there will be multiple competitors willing to acquire the same target and the higher premium will eliminate the synergistic value and the acquirers' shareholders returns. Also, another reason for abnormal returns is the relatedness of the acquirer with the target, as well as the relatedness of the rivals with the target (Barney,1988). When bidding firms are highly related to the target and have exclusive synergistic cash flows, they experience higher CARs, because they pay lower premium.

Moreover, acquirers receive positive abnormal returns when they acquire unlisted companies compared to listed targets, a factor referred as "listing effect" (Faccio, McConnell and Stolin,2006; Moeller, Schlingemann and Stulz,2004; Fuller,2002). One interpretation of this phenomenon could be the lower premium that the bidders pay for non-public targets compared to public ones, leading to higher CARs. Another reason could be the information asymmetry between the private target and the market, which can provide opportunities for the acquirer to exploit this valuable information and create positive abnormal returns (Makadok and Barney,2001). This is associated with the lack of liquidity in private investments that causes them to be unappealing and less valuable than similar liquid investments, which are in general the public acquisitions (Fuller, 2002).

2.2.3 Various factors related to CARs of single and serial acquirers

In terms of the relative performance of serial acquirers compared to single acquirers, there are several studies that have investigated long- and short-term abnormal returns. The empirical evidence is contradicting, with some studies reporting that serial acquirers outperform single acquirers in stock-returns measures (Stegemoller,2001; Baker and Limmack,2001), whereas other studies indicate that the abnormal returns of serial acquirers are much lower than those of single acquirers (Ismail,2008; Li, Carline and Farag,2016).

Previous research has also emphasized a size effect on the CARs of the acquirers, meaning that the larger the deal and consequently the premium paid for it, the lower the stock-returns of the shareholders (Moeller, Schlingemann and Stulz,2004). Moreover, serial acquirers, due to their magnitude and incorporation of the previous synergistic value, buy targets of decreasing relative size (target to acquirer), however increasing absolute size, which involve higher integration costs leading to lower abnormal returns

for their shareholders (Faccio, McConnell and Stolin,2006; Billett and Qian,2008; Ismail, 2008; Ahern,2010).

Previous studies have shown an effect on the abnormal returns of the acquirers' shareholders due to the method of payment in deals. Deals financed with equity generally create lower returns than cash and mixed deals, especially for serial acquirers in public deals (Fuller, Netter and Stegemoller,2002, Ismail, 2008). However, in periods of high mis-valuation, firms will probably acquire targets using stock as a method of payment, as they perceive themselves overvalued, leading to lower premiums due to the overvaluation of the industry, and higher CARs because they buy targets with high growth options (Kropf, Robinson and Viswanathan, 2005).

Toehold presence can reduce information asymmetry about the value of the target, resulting in lower premiums and higher subsequent returns for the shareholders (Ismail, 2008), so it can be a crucial part of a serial acquisition strategy that provides access to a new industry or geography and forges the probability of follow-on acquisitions. Additionally, a minority stake in a company can act as an option of full acquisition of the target, when uncertainty in the industry level is resolved and improve the acquirer's bidding position, leading again to a lower premium and potentially abnormal returns (Smit and Kil,2017).

Learning is an important factor and can have different implications in explaining potential differences in the returns of serial and single acquirers. Firstly, the learning hypothesis is associated with experience building, so when serial acquirers learn from their previous deals, they can estimate valuations of potential targets more accurately as well as their expected synergies, so uncertainty is curtailed. This leads to a higher premium due to hubris behavior and a lower ex-post abnormal return for their shareholders (Aktas, Bodt and Roll,2009; Ismail,2008). In contrast with this view, experience and knowledge from past acquisitions, for example after a value-damaging transaction, can result in better selection of targets and a pattern of improving CARs for acquirers' shareholders. A contradicting factor of building experience is memory loss (Aktas, Bodt and Roll,2013). When deals that are conducted, occur at irregular time intervals, then the learning effect is diminishing and the differences in abnormal returns of single and serial acquirers should not be important.

2.3 Hypotheses section

Regardless of their source, the growth options that serial acquirers experience, suggest that they are expected to pay a higher premium for their deals compared to single acquirers due to the embedded option value they foresee within the serial acquisition sequence. Usually, serial acquirers buy an initial platform company that serves for further future acquisitions towards the creation of compound growth option value (Smit, 2001). This acquisition is a respected company and is usually accessible to more competitors within an industry. As a result, buy-and build acquirers will be forced to pay a higher premium for some of the synergistic value they identify (Smit and Moraitis,2010). Hence, the first hypothesis suggests:

Hypothesis 1: Higher premiums can be paid in deals in serial acquisition strategies than single deals.

There are multiple factors that may affect the CARs of single and serial acquirers and induce differences between their shareholders. Acquisition experience has been an important cause of organizational learning that helps serial acquirers draw conclusions from previous experience and produce competitive advantage and superior performance (Barkema and Schijven,2008; Levitt and March,1988). The evidence is inconclusive whether single acquirers gain higher returns than serial ones, or the inverse is accurate. However, considering the first hypothesis that serial acquirers should generally pay higher premiums for their deals than single acquirers, it can be expected that the former ones will be exposed to lower abnormal returns than the latter ones, if they do not appropriate the synergies and growth options embedded in the targets. This is in line with the acquisition of a platform to obtain market access and strategic positions to new industries and gain growth options through economies of scale and scope (Kogut and Kulatilaka,1994; Nikoskelainen and Wright,2007). This requires a higher premium for the embedded growth options and accordingly, lower returns. Hence, the second hypothesis is as follows:

Hypothesis 2: Serial acquirers experience lower cumulative abnormal returns (CARs) than single acquirers.

3. Data and Methodology

3.1 Sample selection

The sample was constructed by searching the Orbis database for all the deals conducted by US acquirers between January 1, 2010 and December 31, 2019 for which premium information was also available, limiting the acquisitions to public-to-public deals. All deals with a disclosed dollar value of at least \$1 million were selected (Gugler, Mueller, Yurtoglu and Zulehner,2003). Another criterion was that the deal had to be completed and result in a transfer of control where the acquirer's share percentage prior to the announcement date was less than 50% and increased to 100% as a result of the acquisition. The Securities Data Company Platinum (SDC) from Thompson Reuters was used to find the CUSIP and SIC codes for the acquirers and targets of the sample. Finally, the Event Study tool from Wharton Research Data Services (WRDS) was used to calculate the CARs of the acquirers.

In order to test the hypotheses, a definition of serial acquirers should be denoted. Therefore, serial acquirers are those that complete at least two successive public acquisitions (Aktas, De Bodt and Roll,2013) within a timeframe of 5 years. Furthermore, information on a range of acquirer-, target- and deal-related variables is required. In addition, the observations that could not be matched through the CUSIP code between Orbis and SDC, or the missing observations in the calculation of CARs through WRDS, were extracted from the sample. These constraints limit the sample to 122 serial acquirers who engage in 308 deals and 353 single acquirers whose first acquisition was not followed by a second one within 5 years, totaling to 661 deals.

Table 1 presents summary statistics. The dollar value of all the deals in the sample is almost \$1,36 trillion. The number of the deals in the table denotes the deals of the single and serial acquirers. Size represents the acquirer's total assets the fiscal year prior to the completion of the deal. The mean deal value is larger for single acquirers than serial ones, whereas acquirer size is larger for the serial acquirers; \$2,133 million vs. \$1,957 million and \$16,516 million vs. \$19,441 million correspondingly (see Table 1). The deals are subdivided into pure cash, pure equity(shares) and mixed, which includes all other combinations of financing. Related transactions refer to those acquisitions between

Table 1: Summary statistics for all, single and serial acquirers across different deal characteristics

	All			Serial acquirers			Single acquirers		
	N#	Deal value	Acquirer size	N#	Deal value	Acquirer size	N#	Deal value	Acquirer size
		(\$ M)	(\$ M)		(\$ M)	(\$ M)		(\$ M)	
Full sample	661	2,051	17,269	308	1,957	19,441	353	2,133	16,516
<i>Payment method</i>									
Cash		944	34,332		909	23,282		986	40,133
Shares		1,056	8,736		535	6,632		1,641	9,427
Mixed		3,013	12,351		2,873	22,050		2,785	9,621
<i>Geographic scope</i>									
National		2,167	15,431		2,056	20,061		2,270	13,774
Cross-border		963	31,863		665	13,187		1,120	36,754
<i>Industry scope</i>									
Unrelated		2,488	26,304		1,991	30,678		2,670	24,968
Related		1,570	13,443		637	15,275		1,909	12,775

The table presents summary statistics for the whole sample and for single and multiple acquirers. Deals are completed between January 2010 and December 2019 as reported by Orbis database; the deal value is at least \$1 million and only transactions where the acquirer controlled less than 50% of the target prior to the announcement date and holding 100% of the target's shares after the completion of the deal, are considered. Premium information is available for these transactions, so the table refers to public-to-public deals. The method of payment is pure cash, pure equity(shares) or mixed. The geographic scope of the deal is either national for acquisitions of US targets, or cross-border for acquisitions of non-US targets. The industry scope of the deal is either related, if the acquirer and target share the same two-digit SIC code as reported by SDC, or unrelated if they do not. Deal value is the average value paid per acquisition deal. Acquirer size is the average value of the total assets of the acquirers, the fiscal year prior to the completion of the acquisition. Dollar amounts are in millions. 'N' denotes the number of deals of single and serial acquirers.

companies that share the same 2-digit SIC code. National deals are those that involve US targets, whereas cross-border deals are those with non-US targets.

3.2 Methodology in premiums

For the first hypothesis, the acquisition premium is used as the dependent variable. Acquisition premiums are interpreted as the ratio of the purchase price per target share divided by the stock price of the target 4 weeks before the announcement of the takeover (Hayward and Hambrick,1997) and are obtained from Orbis database. As independent variable, a dummy variable is formed that takes the value of one if the deal was conducted by a serial acquirer and zero for single acquirers.

I control for variables that could relate to the dependent and independent variables. At the acquirer level, I control for the acquirer's financial holdings, measured as leverage (debt-to-equity) (Laamanen and Keil,2008; Reuer and Ragozzino,2008), cash and size (total assets) (Moeller, Schlingemann and Stulz,2004). At the target level, control variables include performance (sales) (Laamanen,2007), financial leverage (debt-to-equity) and size (total assets). At the deal level, dummy variables are used to indicate deals financed with equity (Slusky and Caves,1991), cross-border deals and the presence of a minority stake that is less than 50% of the target shares prior to the announcement of the deal (Eckbo,2009). Finally, as the payment of premiums is affected by time-variation and industry characteristics, I control for year and industry fixed effects (Doukas and Petmezas,2007). Acquirer- and target-level variables are obtained from Orbis and Compustat and relate to the fiscal year prior to that of the linked acquisition.

3.3 Methodology in CARs

For the second hypothesis, the dependent variable is the CAR that is calculated using the Event Study tool in WRDS. The announcement date of each deal serves as the event date and an event window of three days [-1,1] around the event date is chosen (Andrade, Mitchell and Stafford,2001; Moeller, Schlingemann and Stulz,2005). This short event

window is picked to eliminate biases deriving from other events and to provide reliable results (Andrade, Mitchell and Stafford,2001). The S&P500 market-adjusted model is used for the estimation of the normal returns (Brown and Warner,1980) and for the calculation of the average index returns, an estimation window with the time frame of [-205, -6] is considered (Moeller, Schlingemann and Stulz,2005). As independent variable, a dummy variable, again as in the first hypothesis, is constructed to denote whether an acquirer is serial or single.

There are also other variables that could affect the magnitude of CARs and will be considered control variables. The first variable will be a dummy variable that takes the value of one if the deal is cross-border and zero otherwise. Another dummy variable indicates whether deals are horizontal, which means that both the acquirer and the target are operating within the same primary 2-digit SIC industry at the announcement date (Gugler, Mueller, Yurtoglu and Zulehner,2003), where one stands for related acquisitions and zero if the deal is unrelated. Furthermore, a variable that takes the value of 1 if the deal is financed with equity and zero otherwise, as well as a dummy variable for the presence of a minority stake are considered (Slusky and Caves,1991; Eckbo,2009). Leverage could also influence the returns of the acquirers, so I also use a control variable to account for this factor. Correspondingly to premiums, CARs can be affected by time-variation and industry characteristics, so I control for year and industry fixed effects (Doukas and Petmezas,2007). In all the regressions, robust standard errors are used in order to account for heteroskedasticity in the observations (White,1980).

4. Results

Descriptive statistics and correlations between the dependent, independent and control variables of the analysis are presented in table 2. The average acquisition premium is 40.44 percent and the average cumulative abnormal return (CAR) is -0.37 percent, which is in line with the previous literature that states acquirers' shareholders generally experience negative abnormal returns in public deals (Magenheina and Mueller,1988; Agrawal, Jaffe, and Mandelker,1992; Loughran and Vijh,1997; Rau and Vermaelen,1998). This is also explained with the correlation between premium and CAR, as can be seen in table 2. The correlation between these two variables is negative (-0.13) and statistically significant, meaning that the higher the acquisition premium, the lower the cumulative abnormal return of the acquirer.

In order to test the first hypothesis, I run regressions explaining differences in acquisition premiums between serial and single acquirers, after controlling for deal characteristics, acquirer- and target-level variables, as can be shown in Table 3. The results show that serial acquirers pay on average 10.5 percent higher premiums than do single acquirers after controlling for deal and acquirer-level variables, indicating that they value higher growth options in a serial acquisition strategy.

The coefficients of the Serial acquirer variable are positive in all the models, meaning that serial acquirers pay higher premiums than single ones, after controlling for deal and firm characteristics, but statistically significant only in model 2. Model 2 shows that serial acquirers pay 10.5 percent higher premium than single acquirers, considering deal and acquirer-level characteristics, with the coefficient being statistically significant at the 5% level. Furthermore, toeholds that mirror the presence of a minority stake prior to the acquisition, reduce premiums by 38.2 percent, with the coefficient being statistically significant at the 1% level. This translates to a better position, when exercising an option on a controlling stake. Moreover, the coefficient of cross-border deal is positive and statistically significant, implying that acquirers pay on average 19.9 percent higher premiums for international deals than domestic ones.

Table 2: Descriptive statistics and correlation matrix

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Bid premium	40.44	0.53	1												
2 CAR	-0.37	0.06	-0.13***	1											
3 Serial acquirer	0.26	0.43	0.10**	0.00	1										
4 Equity deal	0.20	0.40	-0.03	-0.09*	-0.01	1									
5 Cross-border deal	0.11	0.32	0.07	0.00	-0.04	0.02	1								
6 Related deal	0.70	0.46	-0.01	0.00	0.03	0.17***	-0.06	1							
7 Toehold	0.02	0.14	-0.09*	0.02	-0.01	0.04	0.10**	-0.08*	1						
8 Acquirer total assets	14.77	2.11	-0.12***	0.04	0.13***	-0.12***	-0.13***	0.00	-0.03	1					
9 Acquirer leverage	3.24	4.89	0.00	0.04	0.10**	0.08*	-0.15***	0.21***	-0.06	0.13***	1				
10 Acquirer cash	11.78	2.35	-0.05	0.10**	0.07	-0.22***	-0.02	-0.15***	0.00	0.64***	-0.10**	1			
11 Target total assets	13.29	2.12	-0.21***	0.08*	-0.05	0.12**	-0.17***	0.09*	0.06	0.36***	0.14***	0.11**	1		
12 Target leverage	4.10	16.72	0.13***	-0.06	0.16***	0.02	-0.08*	0.08*	-0.01	0.05	0.05	-0.05	0.02	1	
13 Target sales	11.97	2.89	-0.15***	0.11**	-0.09*	-0.15***	-0.15***	-0.08*	0.02	0.31***	-0.02	0.18***	0.62***	-0.04	1

The table presents descriptive statistics and correlations of the dependent, independent and control variables used in the analysis. Bid premium and cumulative abnormal return (CAR) are the dependent variables in the two hypotheses. Bid premium information is obtained from Orbis database. CAR is calculated for an event window of three days [-1,1], using the Event Study tool in WRDS database. Serial acquirer is the independent variable in both the hypotheses, which is a dummy variable with the value of one denoting that the deal was conducted by a serial acquirer and zero for single acquirers. All the remaining variables (4) to (13) are the control variables. Equity deal is a dummy variable that takes the value of one if the deal is financed with equity and zero otherwise. Cross-border deal is another dummy variable that takes the value of one if the deal is transnational and zero if it is conducted in a national level. Furthermore, Related deal variable indicates whether deals are horizontal, which means that both the acquirer and the target are operating within the same primary 2-digit SIC industry and takes the value of one if so, as well as a dummy variable for the presence of a minority stake is considered with Toehold. All the acquirer- and target-level variables are obtained from Orbis database and Compustat and transformed into logarithmic values. ***, ** and * indicate significance on the 1%, 5% and 10% level, respectively.

Table 3: OLS regressions on bid premium between single and serial acquirers by deal characteristics

Model:	1	2	3	4
	Bid premium	Bid premium	Bid premium	Bid premium
Serial acquirer	0.089 (0.057)	0.105** (0.05)	0.060 (0.056)	0.064 (0.052)
Equity deal	-0.023 (0.055)	-0.034 (0.055)	-0.015 (0.065)	-0.018 (0.065)
Cross-border deal	0.219* (0.11)	0.199* (0.103)	0.161 (0.099)	0.159 (0.098)
Toehold	-0.381 (0.08)	-0.382*** (0.075)	-0.335*** (0.088)	-0.336*** (0.085)
Acquirer total assets (ln)		-0.032** (0.014)		-0.016 (0.013)
Acquirer leverage		0.004 (0.003)		0.007 (0.004)
Acquirer cash (ln)		0.012 (0.009)		0.009 (0.011)
Target total assets (ln)			-0.035* (0.088)	-0.034* (0.019)
Target leverage			0.004** (0.001)	0.004** (0.001)
Target sales (ln)			-0.007 (0.014)	-0.005 (0.014)
Constant	0.416*** (0.086)	0.729** (0.325)	0.97*** (0.286)	1.048** (0.416)
YEAR FIXED EFFECTS	YES	YES	YES	YES
INDUSTRY FIXED EFFECTS	YES	YES	YES	YES
Adj. R-squared	0.033	0.045	0.079	0.083
Observations	475	474	474	474

The table reports the pooled OLS regressions explaining differences in acquisition premiums between serial and single acquirers, controlling for variables of deal characteristics, acquirer- and target-level. Bid premium

information is obtained from Orbis database. Serial acquirer is a dummy variable with the value of one denoting that the deal was conducted by a serial acquirer and zero for single acquirers. Equity deal is a dummy variable that takes the value of 1 if the deal is financed with equity and zero otherwise. Cross-border deal is another dummy variable that takes the value of one if the deal is transnational and zero if it is conducted in a national level. Toehold is a dummy variable that takes the value of one if there is a presence of a minority stake prior to the announcement of the acquisition, and zero if there is not. Model 1 refers to regressions controlling for deal characteristics, models 2 and 3 report regressions controlling for deal as well as acquirer- or target-level characteristics, and model 4 includes all the control variables. All the acquirer- and target-level variables are obtained from Orbis database and Compustat. All regressions use robust standard errors to obtain unbiased standard errors of OLS coefficients under heteroscedasticity. Standard errors are reported in parentheses and levels of statistical significance are indicated by *, ** and *** for 10%, 5% and 1%, respectively.

This could be plausible due to the higher information and transaction costs and because acquirers may not have private information on the growth options of the targets and overpay for them, compared to national deals that are more familiar with the industries. Additionally, larger acquirers in size pay 3.2 percent lower premiums than smaller acquirers, indicated by the coefficient of Acquirer total assets, which is negative and statistically significant. This can be interpreted probably as an accumulation of knowledge and experience from previous acquisitions that result to lower payments for targets.

In order to test the second hypothesis, I run regressions explaining differences in CARs between serial and single acquirers, after controlling for deal characteristics and acquirers' leverage. The results are presented in table 4. The coefficients of the Serial acquirer in all columns are negative, but almost indistinguishable from zero and statistically insignificant. This means that the difference in abnormal returns of serial and single acquirers are almost zero for public deals, although no conclusion can be drawn. In model 3, which includes both deal and leverage characteristics, almost all the coefficients of the variables are close to zero, but all of them are statistically insignificant. This means that the performance of serial and single acquirers cannot be compared efficiently, although the difference is zero between them.

Table 4: OLS regressions on CAR between single and serial acquirers

Model:	1	2	3
	CAR (-1,1)	CAR (-1,1)	CAR (-1,1)
Serial acquirer	-0.001 (0.005)	-0.001 (0.005)	-0.001 (0.005)
Equity deal	-0.009 (0.008)		-0.010 (0.008)
Cross-border deal	-0.007 (0.012)		-0.006 (0.012)
Related deal	0.001 (0.005)		0.000 (0.005)
Toehold	0.021 (0.016)		0.022 (0.016)
Acquirer leverage		0.001 (0.001)	0.001 (0.001)
Constant	0.007 (0.008)	0.003 (0.01)	0.006 (0.009)
YEAR FIXED EFFECTS	YES	YES	YES
INDUSTRY FIXED EFFECTS	YES	YES	YES
Adj. R-squared	0.024	0.021	0.025
Observations	475	474	474

The table reports the pooled OLS regressions explaining differences in cumulative abnormal returns (CARs) between serial and single acquirers, controlling for variables of deal characteristics. CAR is calculated for an event window of three days [-1,1], using the Event Study tool in WRDS database. Serial acquirer is a dummy variable with the value of one denoting that the deal was conducted by a serial acquirer and zero for single acquirers. Equity deal is a dummy variable that takes the value of 1 if the deal is financed with equity and zero otherwise. Cross-border deal is another dummy variable that takes the value of one if the deal is transnational and zero if it is conducted in a national level. Related deal variable indicates whether deals are horizontal, which means that both the acquirer and the target are operating within the same primary 2-digit SIC industry and takes the value of one if so, and zero if they operate in different industries. Toehold is a dummy variable that takes the value of one if there is a presence of a minority stake prior to the announcement of the acquisition, and zero if there is not. Acquirer leverage is obtained from Orbis database or Compustat, and refers to the leverage ratio of acquirers' companies, one year prior to the completion of the acquisition. Model 1 refers to regressions controlling for deal characteristics, model 2 reports regressions controlling for acquirers' leverage and model 3 incorporates both deal and acquirers' leverage variables. All regressions use robust standard errors to obtain unbiased standard errors of OLS coefficients under heteroscedasticity. Standard errors are reported in parentheses and levels of statistical significance are indicated by *, ** and *** for 10%, 5% and 1%, respectively.

In order to check if statistically significant results of the second hypothesis can be derived, another event study analysis is used. An event window of ten days [-5,5] around the announcement date is chosen and for the calculation of the average index returns, an estimation window with the time frame of [-244, -6] is considered (Ahern,2009). As previously, the market-adjusted model is used for the estimation of the normal returns (Brown and Warner,1980).

Table 5: OLS regressions on CAR between single and serial acquirers by deal characteristics

Model:	1	2	3
	CAR (-5,5)	CAR (-5,5)	CAR (-5,5)
Serial acquirer	0.004 (0.008)	0.003 (0.008)	0.003 (0.008)
Equity deal	-0.008 (0.015)		-0.009 (0.015)
Cross-border deal	-0.017 (0.016)		-0.016 (0.016)
Related deal	0.004 (0.01)		0.003 (0.01)
Toehold	0.019 (0.029)		0.02 (0.029)
Acquirer leverage		0.001 (0.001)	0.001 (0.001)
Constant	0.001 (0.012)	-0.003 (0.009)	0.000 (0.011)
YEAR FIXED EFFECTS	YES	YES	YES
INDUSTRY FIXED EFFECTS	YES	YES	YES
Adj. R-squared	0.014	0.011	0.014
Observations	475	474	474

The table reports the pooled OLS regressions explaining differences in cumulative abnormal returns (CARs) between serial and single acquirers, controlling for variables of deal characteristics. CAR is calculated for an event window of ten days [-5,5], using the Event Study tool in WRDS database. Serial acquirer is a dummy variable with the value of one denoting that the deal was conducted by a serial acquirer and zero for single acquirers. Equity deal is a dummy variable that takes the value of 1 if the deal is financed with equity and zero otherwise. Cross-border deal is another dummy variable that takes the value of one if the deal is transnational and zero if it is conducted in a national level. Related deal variable indicates whether deals are horizontal, which means that both the acquirer and the target are operating within the same

primary 2-digit SIC industry and takes the value of one if so, and zero if they operate in different industries. Toehold is a dummy variable that takes the value of one if there is a presence of a minority stake prior to the announcement of the acquisition, and zero if there is not. Acquirer leverage is obtained from Orbis database or Compustat, and refers to the leverage ratio of acquirers' companies, one year prior to the completion of the acquisition. Model 1 refers to regressions controlling for deal characteristics, model 2 reports regressions controlling for acquirers' leverage and model 3 incorporates both deal and acquirers' leverage variables. All regressions use robust standard errors to obtain unbiased standard errors of OLS coefficients under heteroscedasticity. Standard errors are reported in parentheses and levels of statistical significance are indicated by *, ** and *** for 10%, 5% and 1%, respectively.

Table 5 present the coefficients of the regressions. The results are similar with the previous analysis. Specifically, the coefficients of Serial acquirer variable are positive in this analysis and almost close to zero, but once more statistically insignificant. This indicates that when controlling for deal characteristics and acquirers' leverage, no strong evidence concerning the difference in CARs between single and serial acquirers can be provided.

5. Conclusion

This paper contributes to the big strand of acquisition literature explaining premiums (Haunschild,1994; Hayward and Hambrick,1997; Kim, Haleblan and Finkelstein, 2011), regarding serial acquisition strategies (Klasa and Stegemoller,2007; Laamanen and Keil,2008; Barkema and Schijven,2008) as well as cumulative abnormal returns of the acquirers (Agrawal, Jaffe, and Mandelker,1992; Loughran and Vjih,1997; Capron and Pistre,2002). However, studies exploring the performance of US serial acquirers are not plentiful and this paper is the first, to the writer's knowledge, that incorporates and compares both the acquisition premiums of serial and single acquirers and the CARs of those, which could be affected by the level of premium paid in the deal. A real options perspective is adopted that categorizes acquisitions into simple and compound options and provides evidence for the premium differences between single and serial acquirers, which result from the distinctive valuation of growth options embedded in the target. The premium and value differences are then tested in the cumulative abnormal returns between single and serial acquirers.

The study has investigated the premium and CAR differences between serial and single acquirers, after controlling for various acquirer, target and deal characteristics.

Concerning the premium differences between serial and single acquirers, the empirical results reported that serial acquirers pay on average 10.5 percent higher premiums, compared to single acquirers, after controlling for deal characteristics and acquirer-level variables, which is in line with the first hypothesis. Additionally, the presence of a minority stake leads to 38.2 percent lower premiums, which translates to a better position after controlling for a toehold in the target company. Also, international deals result in 19.9 percent higher premiums than national acquisitions by virtue of information and transaction costs. Finally, larger acquirers pay on average 3.2 percent lower premiums than smaller acquirers, due to potential experience and knowledge from previous deals. The coefficients of Serial acquirer variable are also positive, after controlling for deal, acquirer- and target- level variables, but statistically insignificant.

The results are inconclusive relating to differences in cumulative abnormal returns between serial and single acquirers. The CAR is calculated with an event window of 3 days [-1,1] (Andrade, Mitchell and Stafford,2001; Moeller, Schlingemann and Stulz,2005)

to rule out biases deriving from other events and to provide dependable results. An estimation window with the time frame of [-205, -6] is examined (Moeller, Schlingemann and Stulz,2005). The evidence showed that single acquirers do not earn higher abnormal returns compared to serial acquirers, with the coefficient being almost identical to zero, but statistically insignificant, after controlling for deal characteristics and acquirers' leverage. The results are similar after controlling separately for deal and leverage variables, with the coefficient being close to zero and statistically insignificant.

In order to check if the results are robust and unbiased, another analysis was conducted for the second hypothesis, using a different event window for CARs with a different time frame. An event window of ten days [-5,5] around the announcement date is chosen and an estimation window with the time frame of [-244, -6] is considered (Ahern,2009). The results supported the first analysis. Controlling for deal characteristics and acquirers' leverage, the coefficient of the Serial acquirer variable remained close to zero and statistically insignificant.

The insights and results of this paper present several recommendations for future research. Firstly, the real options perspective on premium differences between single and serial acquirers could be augmented with the integration of managerial characteristics, such as CEO overconfidence or empire building strategy. If these characteristics are incorporated in the results that serial acquirers pay higher premiums than single acquirers, then the conclusion that they value higher growth option values embedded in targets in order to become industry consolidators, will be more robust. Another distinction for future research could be the classification between friendly and hostile acquisitions, to investigate the results in acquisition premiums and if hostile takeovers relate to payment of higher premiums. Furthermore, the period of 2010 to 2019 that is chosen for the sample includes the global financial crisis that affected the domain of acquisitions. This could be the reason that the sample was restricted to 661 public deals, conducted by 122 serial acquirers and 353 single acquirers. Also, this could explain the takeover of mostly private targets that require less premiums and earn higher abnormal returns, as well as the deflection of serial acquisition strategies, justified by the limited number of serial acquirers in the sample. Future research could elaborate more on serial acquirers and examine their private deals in combination with the public ones, when information is available, to provide further insights on the acquisition premiums and the cumulative abnormal returns of these acquisitions.

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