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Article

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Long-term effect of the form of payment in Spanish mergers and acquisitions: an event study

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ABSTRACT

This paper explores the methods of payments for companies engaged in mergers or acquisitions, focusing on the Spanish market from 2007 to 2019, specifically on transformative transactions. We use a novel approach to build a sample of homogeneous corporate transactions that allows us to measure the performance for the acquirer one year after the announcement. A descriptive analysis, considering seventeen criteria, and an event study performed using the market model, CAPM and the Fama-French and Carhart four factor model, evaluate the acquirer's performance post-announcement. Statistically significant results indicate that using shares over cash is preferable for acquirers to achieve sustained success. These findings reveal that, despite theoretical advantages of cash, shares as method of payment may lead to better stock market performance, limited financial profile deterioration, and more favorable long-term prospects for shareholders.

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1. Introduction

Corporate growth and value creation are fundamental objectives for management teams, as emphasized by Friedman (1970), who underscores the responsibility of achieving maximum benefits for shareholders. To create value, companies must demonstrate that their decisions generate returns exceeding costs, forming a virtuous circle (Bughin & Copeland, 1997). Mergers and acquisitions (M&A), both vertical and horizontal, serve as instruments for managers to pursue these objectives (Pardo-Garcia & Sempere-Monerris, 2015), and although originated in the USA at the turn of the 20th century, they are currently considered a global phenomenon based on a variety of motives and success factors as highlighted by Calipha et al. (2010).

These corporate transactions have been considered contagious (Öberg & Holtström, 2006), and it is possible to identify periods of increased corporate activity in what are known as merger waves shaped by economic, regulatory, and technological changes, along with central bank policies (Chernenko et al., 2021; Harford, 2005). Mergers and acquisitions were surging in recent years, and even after the pandemic disruption, the post 2020 rebound was strong, reaching historical volumes of \$4.3 tn and 41,000 deals in 2021. Since then, 2022 slowed down to \$2.7 tn and 37,000 deals due to factors such as rising interest rates, geopolitical uncertainty, and global conflicts. Although this decline continued during the first half of 2023, during the last quarter of said year it looks like M&A activity was picking up and may be gathering momentum.¹

Despite the long history and established track record of M&A, there seems to be a popular view that this activity is unprofitable and many deals fail (Bruner, 2002; Grubb & Lamb, 2001; Straub 2007). The outcome of the transactions is affected by key determinants such as CEO overconfidence,

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acquirer-target relatedness and complementarity or shareholder intervention (Renneboog & Vansteenkiste, 2019). Additionally, the method of payment plays a key role in the probability of failure together with target status, diversification, and acquirers prior experience (Tanna et al., 2020). However, the research on M&A success focuses on firms' performance around and after a takeover using a wide variety of performance measures and heterogeneous samples, which complicates drawing accurate and unambiguous conclusions. Thus, according to Renneboog and Vansteenkiste (2019) 'given the small number of M&A research areas that consistently predict deal success or failure, it remains essential to investigate both short- and long-run return measures when examining post-deal performance. Moreover, the lack of long-run evidence for many areas of the M&A literature provides substantial scope for further research.'

This paper presents an empirical study on how payment methods for M&A deals affect the acquirer's long term performance (one year after the announcement) in a sample of Spanish companies. Most of the existing research on this field comprises US or UK companies, although some works have studied other geographies like Canada (Eckbo et al., 1990 and Masse et al., 1990), Japan (Higgins, 2013), Australia (Diepold et al., 2008), Greece (Liargovas & Repousis, 2011), or The Netherlands (Swieringa & Schauten, 2007) among others. Alexandridis et al. (2010) carry out an empirical analysis with a global M&A sample and conclude that the acquiring firm's performance vary across countries depending on the competition of takeover markets. Similarly, Moschieri et al. (2014), Faccio and Lang (2002) or Feito-Ruiz et al. (2014) study European M&A activity analyzing cross-border activity, showing that M&A deals appear to be affected by country factors, like its legal and institutional environment. Therefore, multi-country studies need to be complemented with single country studies. In Spain, previous studies are limited and primarily concentrate on short-term effects, such as abnormal returns on the deal announcement date (see Farinós Viñas et al., 2017; Fernández & Gómez-Ansón, 1999; García & Ferrando, 1992; Miguel et al., 2003). Therefore, our research enhances the existing body of country-specific literature by focusing on Spanish transactions.

The research is based on the construction of a novel database of homogeneous transactions in the Spanish market that could properly assess long-term performance for the acquirer depending on the payment method. With this purpose in mind, and in order to keep a homogeneous and comparable set, it was necessary to find a reliable criterion to include or exclude transactions in the final sample, which finally included 39 transactions (all of them listed, with a Spanish component, either target or acquirer, and that meet the restrictive criteria to be useful for a long-term analysis). After a quantitative and qualitative description summary of the database, we carry out an event study measuring the impact on the acquirer on absolute terms, versus the reference indexes, and analyzing the abnormal returns as per the CAPM model (Sharpe, 1964) and the Fama and French (1993) model enhanced by Carhart (1997) four factor model (for convenience along the paper we will refer to this model as the Fama-French-Carhart). We confirm the statistical robustness of the research.

Findings show that methods of payment do have an effect in the acquirer's long term performance, showing higher abnormal returns on stock deals than in cash deals.

M&A research on methods of payment has always attracted a lot of attention, and there is extensive literature on the subject, as explained in the next section. The studies often focus on empirical tests, due to the practical and always evolving nature of this field and to the interest of this topic not only for academics but also for practitioners. Our paper is ingrained in these type of empirical studies on the effect of M&A consideration, showing the following contributions: (i) while most works study the short-term reaction immediately after the deal, we analyze the long-term effect of the transaction on the acquirer's performance, (ii) we improve over previous works that also covered long-term effects, since the contamination effect of other events on the acquirer is mitigated by building a homogeneous and comparable database of M&A with an innovative and valuable approach, (iii) our sample of Spanish companies adds to the body of works that focuses on local geographies, with a similar legal framework, enriching the international analysis of such a global phenomenon as M&A transactions.

The subsequent sections follow a structured approach: Section 2 provides a relevant yet non-exhaustive literature review, while Section 3 details the selected sample and applied methodology. Section 4 summarizes analyses, including sample analysis, event study, and statistical significance tests. Finally, Section 5 concludes the paper, highlighting avenues for future research.

2. Literature review

There are various approaches that have analyzed the method of payment of corporate transactions, from theoretical works (Eckbo et al., 1990; Fishman, 1989 or Hansen, 1987) to several empirical papers that focus on the choice of stock versus cash (Boone et al. 2014; Carleton et al., 1983; Eckbo & Langohr, 1989; Faccio & Masulis, 2005; Franks et al., 1991; Huang & Walkling, 1987; Martin, 1996, among many others). Works like Bruner (2002) or Sankar and Leepsa (2018) summarize different studies identifying a variety of factors that affect the means of payment in M&A deal.

The presence of information asymmetry causing a certain choice between cash and stock is behind many of the works, like Eckbo et al. (1990); Fishman (1989); Hansen (1987); Ismail and Krause (2010), Travlos (1987) and Yook et al. (1999), who mention the need to mitigate information asymmetry between the buyer and the target company by using the buyer's stock as the payment method, while cash payments are more common when there is greater clarity of information. On the same line, Shleifer and Vishny (2003) assume that markets are not rational, but acquirers' managers take advantage of paying with stock when they know their stock have high valuations, exploiting the false belief of the target company's shareholders, who may think that the offer is better than it is (Rhodes-Kropf & Viswanathan, 2004; Savor & Lu, 2009). Several studies show that stock acquisitions are more common when valuations are high, associating the payment method with the buyer's valuation (see Aguirreamalloa, 2013; Brown & Ryngaert, 1991; Dong et al, 2006; Farinós Viñas et al, 2017).

The literature on payment choice in M&A also rests on tax considerations, based on the different taxation of stock and cash payments (Auerbach & Reishus, 1988; Ayers et al., 2003, 2004; Houston & Ryngaert, 1997). Since paying with stock means there is no immediate tax effect for target shareholders, who defer tax payments until they eventually sell the new shares, some believe that cash offers would have a higher premium vis a vis stock offers to compensate the capital gain tax. Also, stock offers become more appealing when taxes are high. Several empirical works (e.g. Harris et al., 1987; Huang & Walkling, 1987; Wansley et al., 1983) support the role of tax when choosing the deal's payment form.

Continuing with possible approaches, Bharadwaj and Shivdasani (2003); Dong et al. (2006); Faccio & Masulis, 2005; Harford et al. (2009) and Martin (1996), show that the buyer's indebtedness is another variable to consider. The form of payment will therefore vary depending on the investment opportunities available (Martin, 1996; Swieringa & Schauten, 2007; Zhang et al., 2003) and the company's target leverage ratios (Harford et al. 2009; Uysal, 2011). Aguirreamalloa (2013) mentions payment methods are related to other variables according to the literature, such as the buyer's shareholding structure, since stock payments imply a potential dilution and therefore a change in the control *status quo* (Amihud et al., 1990; Blackburn et al., 1997; Eckbo et al, 1990; Faccio & Masulis, 2005; Harris & Raviv, 1988; Stulz, 1988; Yook et al, 1999) or the willingness to provoke transactions with a higher level of competition from other bidders (Fishman, 1989). Other factors studied are the preferences of target shareholders (Burch et al, 2012; Gaspar et al, 2005), the negotiating power of the target to accept stock based on the distance between the share price and the investor's reference point (Chira & Madura, 2018), the fact that the bid is solicited or unsolicited (Dong et al, 2006; Huang & Walkling, 1987; Schwert, 2000) or the relative size of both companies, the target and the buyer (Draper & Paudyal, 2006; Gullon et al., 1997; Swieringa & Schauten, 2007).

Based on the reviewed articles, there are several challenges that academia faces when creating knowledge in this area of corporate finance:

There is some debate on whether it is preferable to use short-term (e.g. Diepold et al., 2008) or long-term windows (e.g. Barber & Lyon, 1997) in event studies, since the evidence is unclear. On one hand, Healy et al. (1992), found a positive relation between short window abnormal stock returns and long-term post-acquisition increases in operating cash flows. On the other hand, as Zollo and Meier (2008) remind us, the use of long-term windows is conceptually preferred, given the evidence on market imperfection at the time of the announcement of complex events such as acquisitions. Harrison et al. (2005) demonstrated that while the market's immediate response to the announcement is positive, the long-term reaction is significantly negative. Furthermore, several control variables exhibit significant long-term effects, suggesting that the market fails to accurately foresee the economic consequences of the announced acquisitions, leading to systematic over- or under-reactions.

Most works analyze the choice of payment method for M&A transactions looking at its short term effect, that is, the impact on the acquirer's stock price around or on the same day of the announcement: Asquith et al. (1983); Boone et al. (2014); Brown and Ryngaert (1991); Eckbo et al. (1990); Franks and Harris (1989); Huang and Walkling (1987); Ismail and Krause (2010); Peterson and Peterson (1991); Savor and Lu (2009); Travlos (1987); Uysal (2011); Wansley et al. (1983); Yook et al. (1999). Some studies do analyze the longer-term impact, like Agrawal et al. (1992) or Loughran and Vijh (1997), who consider a five-year post-merger period; Sullivan et al. (1994); who look at the period until the merger is finalized, same as Asquith (1983), who considers this period to be 240 trading days after the bid. Other studies look at a three-year period (Mitchell & Stafford, 2000; Rau & Vermaelen, 1998), or 30/36 months (Chakrabarti et al., 2009; Zollo & Meier, 2008). It is clear that long-term returns need to be controlled by other factors and its proper calculation is challenging besides market reaction considerations, companies undertake numerous actions over the long run that may affect the stock price.

As for empirical studies, one interesting approach is to study a case in-depth and extract the most relevant conclusions, trying to find valuable insights for the topic (e.g. Bruner, 1999; Bruner, 2015; Gielens et al., 2008; Kaplan 1989; Lys & Vincent, 1995). However, the most common approach is to build a sample of transactions in a specific period and in a specific region on which to test hypotheses. (Boone et al., 2014; Burch et al., 2012; Emery & Switzer, 1999; Feito-Ruiz et al., 2014; Harris et al., 1987; Heron & Lie, 2002; Higgins, 2013; Huang et al., 2012; Huang & Walkling, 1987; Ingham et al., 1992; Ismail & Krause, 2010; Karampatsas et al., 2014; Martin 1996; Masse et al., 1990; Pinkowitz et al., 2013; Ruback, 1983; Sullivan et al., 1994; Travlos, 1987; Uysal, 2011; Vermaelen & Xu, 2014; Wansley et al., 1983; Yook, 2003; Yook et al., 1999). These samples are usually large and combine different transactions, so they are not homogeneous, a fact which makes more difficult to interpret results and infer general insights. As Renneboog and Vansteenkiste (2019) remind us, 'wide variety of performance measures and heterogeneity in sample sizes complicates the drawing of accurate and unambiguous conclusions.'

Regarding the geographic scope, as previously mentioned, most existing research has focused on US data (Burch et al., 2012; Emery & Switzer, 1999; Ismail & Krause, 2010; Pinkowitz et al., 2013; Sullivan et al., 1994; Yook, 2003), or the UK (Franks & Harris 1989) although global studies are also available (Alexandridis et al., 2010; Faccio & Lang, 2002; Feito-Ruiz et al., 2014; Moschieri et al., 2014), and works with local samples (Eckbo et al., 1990; Farinós Viñas et al., 2017; Higgins, 2013; Masse et al., 1990; Swieringa & Schauten, 2007) are gaining popularity based on an interest to disentangle the effect of specific country factors in M&A deals. Spanish M&A activity ranks consistently in the top-five position in Europe after the United Kingdom, France, Germany, and the Netherlands as per Mergermarket annual reports of the last years, and its specific country idiosyncrasies, its links to Latin America, where many companies have sought expansion through inorganic growth and its legal and institutional framework make it a relevant market deserving attention for a corporate transaction study.

3. Methodology

3.1. Sample construction

To tackle the previously mentioned challenges, a novel approach to sample construction was developed, with specially selected deals that followed certain features and represent what we have called a 'Transformative Transaction'. A Transformative Transaction is defined as a corporate transaction in which, during the period from its announcement to one year later, the acquirer does not undertake any more relevant internal or external actions in the company other than (i) integrating the conducted transaction and (ii) investing all its time and resources into the organic business without any other significant changes. Often, a Transformative Transaction would represent a large deal, in terms of the relative size of target vs. buyer, that being one of the reasons why the acquirer spends the following year integrating the newly acquired company.

Focusing on Transformative Transactions will avoid most contaminating events that could impact the company performance, following Golubov et al. (2015) who stress the importance of accurately isolating

the takeover effect from other factors affecting the firm when measuring long-run returns. The resulting sample, built only with Transformative Transactions, will be more homogeneous and should lead to more robust results when measuring long term performance.

A Transformative Transaction can be done by a serial or non-serial (single) acquirer. Serial acquirers are companies that have carried out a certain number of transactions during an analyzed timeframe (Billett & Qian, 2008; Fuller et al., 2002; Karolyi et al., 2015; Kengelbach et al., 2012). According to Renneboog and Vansteenkiste (2019), serial bidders are quite a common phenomenon: they were responsible for over 25% of M&A activity in the 1980s and 1990s (Klasa & Stegemoller, 2007), 75% of listed US firms were frequently engaged in corporate transactions during the 1990s and 2000s (Netter et al., 2011) and they performed 32% of public deals and 31% of private deals in the 2010–2015 period (Alexandridis et al., 2017). Karolyi et al. (2015) estimate that one in five public bidders is a serial buyer.

For our research, we include both serial and non-serial buyers in our sample, focusing on the specific Transformative Transactions per buyer.

The following Figure 1 provides a simplified outline of the definition of a Transformative Transaction.

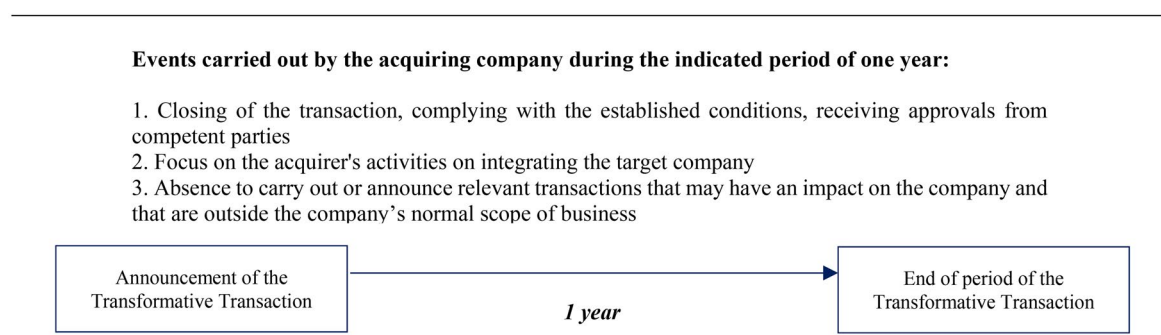


Figure 1. Illustrative scheme of a Transformative Transaction.

Our sample of transactions is drawn from the CapCorpData dataset, provided by Capital&Corporate – Grupo Ifaes, a private Spanish data provider for Private Equity and M&A transactions. Looking at the period from 2007 to 2019, we initially obtained 2,325 deals in which at least one of the companies involved had to be Spanish. Transactions where the acquirer was not a listed company in an official stock exchange were excluded from this study, as were state owned companies. Also, only deals that could be categorized as a merger or an acquisition were included, excluding IPOs or block trades. After this first filter, we were left with 60 transactions.

The second filter used to confirm if the transaction is transformative was to analyze and identify, for each potentially qualifying transaction, all relevant events registered in the stock market supervisor where they buyer shares are traded, during the period from the announcement of the transaction to one year afterwards. For Spanish publicly traded companies, we checked the information provided by the Spanish market regulator, the Comisión Nacional del Mercado de Valores (CNMV), and for non-Spanish traded companies that had acquired a Spanish target, the relevant events disclosed in the corresponding market supervisor. This filter aimed to verify if the proposed definition for Transformational Transaction could be met. Our categorization produced a final sample with 39 Transformative Transactions with Spanish elements (buyer, target or both) for the period 2007–2019 that conform a homogeneous set for the purpose of our research. Although the size of the sample is reduced compared with related works about methods of payment in M&A, this is due to the restrictive requirement of no contaminating events, which entails a better comparability of the observations for the purposes of our analysis. Also, smaller samples are often used for country specific M&A research (e.g. Diepold et al, 2008 use a sample of 50 Australian deals), or for M&A event studies (Dilshad, 2013 carry out an event study with 18 transactions).

This process is summarized in Figure 2.

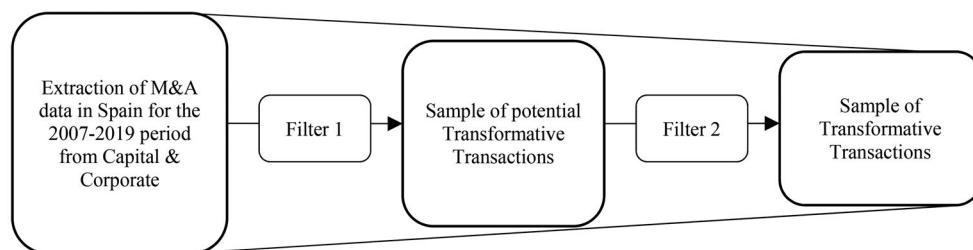


Figure 2. Sample construction methodology.

A summary of the whole sample is included in Table A1, and all its detailed data is available at Harvard Dataverse ('Spanish dataset or mergers and acquisitions 2007–2019', <https://doi.org/10.7910/DVN/2WK6ON>). Most acquirers in the sample are companies that experienced only one Transformative Transaction within the timeframe considered, but a few, such as Iberdrola, BBVA, Santander, and Grifols, completed more than one transaction.

3.2. Sample descriptive analysis

First, we describe our database of 39 Transformative Transactions, analyzing seventeen quantitative and qualitative indicators related to the acquirer. We compare overall outcomes and distinguish between transactions that used cash and those that used stock. The detailed indicators for the acquirer, include:

1. Absolute stock market performance measured as the change in the stock price.
2. Dividend yield.
3. Total shareholder return (the sum of stock market performance and dividend yield).
4. Relative stock market performance compared to the reference market index.
5. Valuation multiple defined as enterprise value to EBITDA.
6. Valuation multiple defined as market capitalization to net profit.
7. Valuation multiple defined as market capitalization to book value.
8. The profitability ratio calculated as net profit over equity.
9. The profit margin ratio calculated as net profit over revenue.
10. Asset turnover ratio calculated as revenue over total assets.
11. Leverage ratio calculated as total assets over equity.
12. Does the acquirer need to reduce dividends?
13. Does the acquirer need to issue additional capital?
14. Does the acquirer need to sell assets to reduce debt?
15. Does the acquirer need to change the Chairman or CEO?
16. Does the acquirer experience negative changes in the rating?
17. Does the acquirer need to undergo a restructuring process?

3.3. Event study

After the descriptive analysis, an event study was conducted, defining the event day as the announcement day of the Transformative Transaction, trying to determine whether the transaction itself had an impact on the long-term performance of the acquirer, and if this impact differs between transactions paid with cash and those paid with stock. The return of the acquirer has been measured on absolute terms, assuming a one year buy and hold strategy (BHAR) (see Mitchell & Stafford, 2000 for a revision of flaws when applying BHAR), and calculating the abnormal return of the acquirer taking as a benchmark the performance of the market index, the cost of equity as per the Capital Asset Pricing Model (CAPM) and

the cost of equity as per Fama-French-Carhart four factor model. As Kothari and Warner (2007) point out 'while the exact definition of long horizon is arbitrary, it generally applies to event windows of 1 year or more', as is the case of our study. Statistical inference is applied to confirm the significance of the results.

Event studies have a long academic history, (Ashley, 1962; Barker, 1956; Dolley, 1933; Myers & Bakay, 1948). However, two articles from the late 1960s were fundamental to this research field: Ball and Brown (1968) and Fama et al (1969) introduced the methodology for conducting these studies. Ball and Brown applied it to firms' financial results, while Fama studied the effects of splits, isolating the effect from simultaneous dividend increase announcements.

Since then, event studies have become a widely used methodology to examine the impact of firm-specific and economy wide events on the value of a firm, with applications in the field of accounting and finance, like earnings announcements, debt issuances, capital increases, and macroeconomic events, among others. Reviewing the immense event studies literature exceeds the scope of this paper although many examples could be mentioned in the M&A field (Antoniadis et al., 2014; McAfee & Williams, 1988; Shah & Arora, 2014), where event studies have been used numerous times: analyzing transactions in certain industries, like the banking sector (Liargovas & Repousis, 2011; Dilshad, 2013), internet (Uhlenbruck et al., 2006; Zaheer et al., 2010) or renewable energy (Yoo et al., 2013); measuring the profitability of M&A deals (Capron & Pistre, 2002; Duso et al., 2010; Diepold et al, 2008; Elad & Bongbee, 2016; Oler et al., 2008), or the effect prior to the announcement date (Rani et al., 2015). Also, event studies have been used for studies with a country focus (Akben-Selcuk, 2015; Cortés et al., 2015; Keller, 2010; Kohli, & Mann, 2012; Simões et al., 2012).

3.3.1. Event study framework

We follow the general guidelines by MacKinlay (1997) and Kothari and Warner (2007) for this study. The event is the announcement of the transaction, with the event window spanning from the announcement day to one year after. The estimation window for calculating abnormal returns is the year preceding the event.

In the event window, an abnormal return is the difference between the actual return obtained by the company and the normal return. The actual return is calculated using the acquirer's stock price, while the normal return is the expected performance without the event. To measure the event's impact, it is essential to estimate the normal returns and to calculate these abnormal returns.

Long-horizon tests are susceptible to the joint hypothesis problem, which combines testing whether abnormal returns are zero and whether the assumed model of expected returns is correct (Kothari & Warner, 1997). Proper risk adjustment in calculating abnormal returns is crucial, making the model for expected returns key. We use two models to estimate normal returns: the market model and the four-factor Fama-French and Carhart model.

The Fama and French (1993) three-factor model, enhanced by Carhart (1997), incorporates Size, Book-to-Market, and Momentum factors along with the market factor. These factors are crucial for isolating the incremental impact of a transaction on stock price performance, controlling from overall market influences applicable to all stocks.

For our event study on 39 transformative transactions in Spain between 2007 and 2019, the analysis will be conducted for the acquiring companies and further divided into cash and stock transactions to compare the different impacts.

3.3.2. Application of the event study

The sample of 39 Transformative Transactions, meets the conditions of homogeneity and comparability: All the acquirers are listed and have carried out a corporate transaction that has been considered transformative. All transactions have a Spanish element since either the buyer, the target, or both are Spanish companies. This would allow us to draw long-term conclusions without the contaminating effect of other relevant events that may affect the stock. Transformative Transactions are important enough so that during the year after its announcement, the acquirer's main task has been its integration.

As mentioned, with the application of an event study, our goals are twofold: to measure the long-term impact of the Transformative Transaction on the acquirer's return, and to determine if different forms of payment, cash or shares, produce different results.

The market may react positively or negatively in the short term after the announcement and differently over the long term based on the transaction's impact. The form of payment is a crucial factor in structuring corporate transactions. To capture this, each observation is categorized by the form of payment: cash (using cash or debt) or stock (using newly issued shares). There are 7 transactions with a mixed payment (cash and shares) which are categorized as stock since the cash is a small percentage of the total consideration. Therefore, of the 39 observations, 26 use cash, and 13 use shares.

After categorizing the sample, the next step is to specify the parameters of the empirical study. The variable analyzed is the evolution of the acquirer's stock price, observed daily from one year before ($t-1$) the date of the event (t) to one year after the event ($t+1$).

We use the *Capital Asset Pricing Model* (Sharpe, 1964; Lintner, 1965) to calculate the expected returns. This model determines the expected return $E(R_i)$ of a stock i based on the risk-free rate (R_f) and its beta (β_i) relative to the market risk premium ($R_M - R_f$). For our analysis, we use the 10-year government bond of the acquirer's country as the risk-free rate (R_f), calculate the acquirer's beta using the previous year's returns and use the market average return from Damodaran (<https://pages.stern.nyu.edu/~adamodar/>), being the CAPM model for each stock i and time t :

$$E(R_{i,t}) = R_{f,t} + \beta_{i,t} * (E(R_{M,t}) - R_{f,t}) \dots \quad [1]$$

Following Mackinlay (1997), returns will be indexed in event time t . Since we use daily observations, we define $t=0$ as the event day, $t = T_0$ to $t = T_1$ as the event window (length one year $L_{+1} = T_1 - T_0$) and $t = T_{-1}$ to T_0 as the estimation window (length one year $L_{-1} = T_0 - T_{-1}$).

We estimate beta $\hat{\beta}_{i,L-1}$ using the daily returns during the year before the event day t :

$$R_{i,L-1} - R_{f,L-1} = \beta_{i,L-1} * (R_{M,L-1} - R_{f,L-1}) + \varepsilon_{i,L-1} \dots \quad [2]$$

where $\varepsilon_{i,L-1}$ is the error term that represents the portion of the return not explained by the model, and define for each company i abnormal returns ($AR_{i,L+1}$) as the difference between the actual returns during the event window ($R_{i,L+1}$) and the returns predicted by the model estimation $E(R_{i,L+1} | X_{L+1})$:

$$AR_{i,L+1} = R_{i,L+1} - E(R_{i,L+1} | X_{L+1}) \quad [3]$$

being X_{L+1} is the conditional information for the normal return model, in this case the event window market return. The abnormal return for each stock i is the disturbance term of Equation (2) calculated on an out of sample model.

As mentioned earlier, we also use the four-factor Carhart (1997) model, which expands on the three-factor Fama and French (1993) model, to estimate abnormal returns. For each stock i and time t :

$$E(R_{i,t}) = R_{f,t} + \beta_{it,1} (R_{M,t} - R_{f,t}) + \beta_{it,2} * SMB_t + \beta_{it,3} * HML_t + \beta_{it,4} * WML_t \quad [4]$$

where $(R_{M,t} - R_{f,t})$ is the market risk premium, SMB_t is the size factor (small minus big), HML_t is the book-to-market factor (high minus low), and WML_t is the momentum factor (winners minus losers) in time t . These factors control for variables affecting all companies' returns and help isolate the event's effect. To account for these factors, we used daily estimates of European factors for developed countries from the Kenneth French data library (Kenneth R. French - Data Library (dartmouth.edu)).

In a similar vein as Equations (2) and (3) we calculate the abnormal returns ($AR_{i,L+1}$) using linear estimation for Equation (4).

For each model, we conduct two tests:

1. For the entire sample, we tested the null hypothesis (H_0) that the Transformative Transaction had no impact on the acquirer, against the alternative hypothesis (H_1) that it did have an impact.
2. For the two subsamples based on the method of payment, we tested the null hypothesis (H_0) that the cash and stock transactions showed similar behaviors, against the alternative hypothesis (H_1) that their behaviors were different.

4. Results

As per was explained in the previous section, we split the results of the research in (i) a descriptive analysis of the sample (ii) the event study (iii) the statistical test to confirm the robustness of the outcomes.

4.1 Descriptive analysis of the transformative transactions sample

Table 1 summarizes the performance of the quantitative variables for all acquirers of the sample of Transformative Transactions, breaking down the results for the sub-sets of transactions conducted with cash and transactions conducted with stock. Number in Table 1 are medians.

Table 1. Summary of the quantitative variables.

	TOTAL		CASH		STOCK	
	−1 YEAR	+1 YEAR	−1 YEAR	+1 YEAR	−1 YEAR	+1 YEAR
Stock price	2.5%	−5.3%	9.6%	−7.9%	−0.4%	14.4%
Dividend yield	2.4%	2.8%	2.3%	3.0%	3.0%	2.2%
Total shareholder return	7.4%	−2.6%	13.5%	−5.6%	0.2%	14.4%
Stock performance vs. Index	4.5%	−0.2%	8.1%	−1.9%	16.2%	18.2%
EV/EBITDA	12.8×	11.2×	13.0×	10.9×	12.4×	21.9×
PE	14.9×	12.9×	18.8×	12.1×	13.0×	16.7×
P/BV	2.4×	2.0×	2.4×	1.9×	2.5×	2.0×
ROE	14%	12%	14%	12%	12%	12%
Profit margin	10%	8%	9%	8%	16%	8%
Asset turnover	0.5×	0.4×	0.5×	0.4×	0.2×	0.2×
Leverage	3.3×	3.8×	3.3×	4.0×	3.2×	3.5×

The acquirer's stock market performance one year after the announcement showed a negative median of −5.3%, with cash-financed acquirers faring worse at −7.9%. In contrast, stock-financed transactions had a significant positive performance of +14.4%. This points to strong market confidence in stock-financed acquirers, as stock prices reflect both present and future expectations.

Dividends per share showed a slightly better outcome for cash transactions compared to stock transactions. Despite the debt incurred in cash transactions, many companies maintained or increased dividends to shareholders. Total shareholder return, which combines stock performance and dividends, was more favorable for stock transactions due to their positive stock market performance.

When comparing the acquirer's stock performance to the reference market index during the same period, Table 1 shows that the relative performance of stock-financed transactions was better than that of cash-financed transactions.

Regarding the valuation ratios of the acquirers, both the EV/EBITDA and PE ratios show that valuations for cash transactions declined one year after the transaction, while stock transactions saw an increase in valuation multiples. The P/BV ratio decreased for both cash and stock transactions, as the increase in book value from the target's integration was greater than the increase in the acquirer's share price.

For ROE, cash transactions showed a small decline, likely due to the positive impact of increased leverage on return on equity. This suggests that companies, on average, maintain a conservative capital structure with lower leverage than optimal.

Table 2 presents the analysis of the qualitative variables for the entire sample, and for the two sub-sets of transactions depending on the chosen form of payment.

Table 2. Summary of the qualitative variables for the acquirer.

	Total	Cash	Stock
Does the acquirer need to reduce dividends?	5	2	3
Does the acquirer need to issue additional capital?	12	6	6
Does the acquirer need to sell assets to reduce debt?	4	4	0
Does the acquirer need to change the Chairman or CEO?	4	2	2
Does the acquirer experience negative changes in the rating?	6	5	1
Does the acquirer need to undergo a restructuring process?	1	1	0

Each number shows observations with an affirmative response to the question for each criterion.

Several acquirers had to issue additional capital one year after the transaction announcement, regardless of whether the transaction was conducted with cash or stock. Additionally, some acquirers in both groups had to reduce their dividends. Six out of the 39 transactions experienced a negative change in their company's rating, with five of these being cash transactions. Four acquirers had to dispose of assets to reduce debt, and all of these were cash-financed transactions. Furthermore, one cash-financed transaction required financial restructuring, while none of the stock-financed transactions did. Additionally, there were four changes in the acquirers' Chairman or CEO, with two occurring in cash acquisitions and two in stock deals.

4.2. Event study results

With the daily share price evolution for each acquirer in the sample, in Table 3 we calculate monthly changes in both absolute terms and cumulative terms, with the acquisition announcement as the reference point.

Table 3. Descriptive statistics of the sample' share price performance evolution.

All acquirers					
	1 week	1 month	3 months	6 months	1 year
Mean	0.4%	-3.5%	-2.3%	-8.1%	-7.4%
Standard Error	0.7%	2.0%	2.8%	3.5%	5.4%
Median	-0.2%	-2.0%	-0.4%	-8.3%	-5.3%
Standard Deviation	0.05	0.13	0.17	0.22	0.34
Sample Variance	0.00	0.02	0.03	0.05	0.11
Kurtosis	0.23	3.88	-0.38	-0.45	-0.12
Skewness	0.36	-1.68	-0.53	0.25	-0.11
Range	0.21	0.62	0.64	0.89	1.42
Min	-0.08	-0.49	-0.41	-0.42	-0.83
Max	0.12	0.13	0.23	0.47	0.59
Sum	0.15	-1.35	-0.91	-3.18	-2.89
Count	39	39	39	39	39
Cash acquirers					
	1 week	1 month	3 months	6 months	1 year
Mean	0.3%	-5.4%	-5.9%	-10.6%	-15.3%
Standard Error	1.0%	2.8%	3.5%	4.4%	6.1%
Median	-0.4%	-3.1%	-3.7%	-8.3%	-7.9%
Standard Deviation	0.05	0.14	0.18	0.22	0.31
Sample Variance	0.00	0.02	0.03	0.05	0.10
Kurtosis	0.19	2.66	-0.59	0.14	0.29
Skewness	0.44	-1.48	-0.38	0.42	-0.31
Range	21%	62%	63%	89%	137%
Min	-8%	-49%	-41%	-42%	-83%
Max	12%	13%	22%	47%	54%
Sum	0.07	-1.39	-1.52	-2.75	-3.97
Count	26	26	26	26	26
Stock acquirers					
	1 week	1 month	3 months	6 months	1 year
Mean	0.7%	0.4%	4.7%	-3.3%	8.3%
Standard Error	1.0%	2.1%	4.0%	5.8%	9.7%
Median	-0.1%	3.7%	4.8%	2.0%	14.4%
Standard Deviation	0.04	0.07	0.14	0.21	0.35
Sample Variance	0.00	0.01	0.02	0.04	0.12
Kurtosis	-0.89	-1.61	0.38	-1.49	-0.71
Skewness	0.16	-0.45	-0.70	0.01	-0.25
Range	12%	20%	50%	59%	117%
Min	-5%	-12%	-27%	-31%	-58%
Max	7%	8%	23%	28%	59%
Sum	0.09	0.05	0.61	-0.43	1.08
Count	13	13	13	13	13

The event study results presented here are based on the analysis of one quantitative variable: the share price performance of the acquirer. Table 3 displays the basic statistics of this variable, illustrating its evolution over the year following the transaction. We examine time horizons of 1 week, 1 month, 3 months, 6 months, and 1 year. Additionally, we provide statistics for the entire sample, as well as for two subsets: cash acquirers and stock acquirers.

As far as the event study is concerned, three groups of results obtained from the event study are presented:

First, the results from the stock returns three months before versus one year after the event and the evolution during these periods, centered around the event date (Table 4, Figures 3 and 4).

Table 4. Price returns per share for the total sample vs each of the subsamples according to different windows of time pre and post event.

Date	Complete Sample		Stock		Cash	
	Window	Cumulative	Window	Cumulative	Window	Cumulative
E-90	2.41%	-2.65%	4.64%	-7.85%	1.30%	-0.05%
E-60	0.14%	-0.23%	1.68%	-3.21%	-0.63%	1.25%
E-30	0.09%	-0.09%	1.53%	-1.53%	-0.63%	0.63%
Event (E)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
E+30	-3.45%	-3.45%	0.37%	0.37%	-5.36%	-5.36%
E+60	1.40%	-2.05%	3.84%	4.20%	0.19%	-5.17%
E+90	-0.29%	-2.34%	0.51%	4.72%	-0.69%	-5.86%
E+120	0.08%	-2.25%	0.38%	5.09%	-0.06%	-5.92%
E+150	-3.45%	-5.70%	-4.89%	0.20%	-2.73%	-8.66%
E+180	-2.44%	-8.15%	-3.48%	-3.28%	-1.93%	-10.58%
E+210	-0.09%	-8.23%	2.91%	-0.37%	-1.58%	-12.17%
E+240	2.70%	-5.53%	3.26%	2.89%	2.43%	-9.74%
E+270	-0.86%	-6.39%	0.24%	3.13%	-1.41%	-11.15%
E+300	-1.16%	-7.55%	-1.26%	1.87%	-1.11%	-12.26%
E+330	0.71%	-6.84%	3.48%	5.34%	-0.67%	-12.93%
E+360	-0.57%	-7.41%	2.96%	8.31%	-2.34%	-15.27%

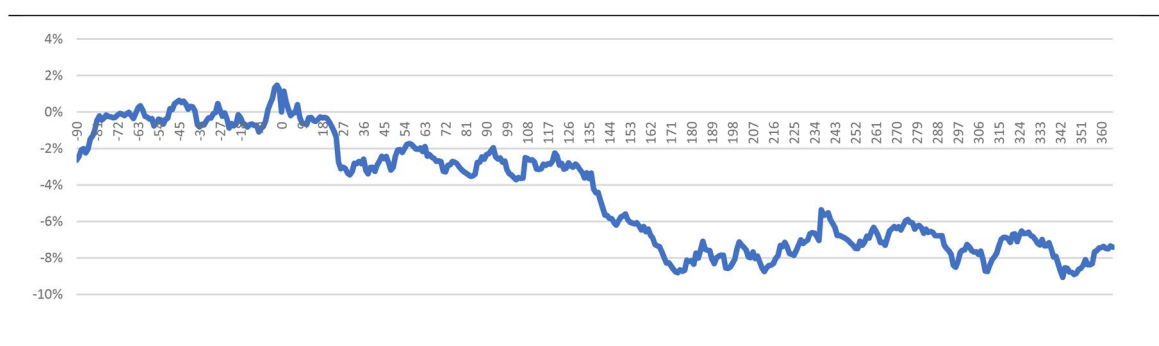


Figure 3. Evolution of the cumulative return of the stock price for each stock in the sample from T – 90 to T + 360, taking the Event as a reference point. (x axis – duration in days, y axis – share price performance).

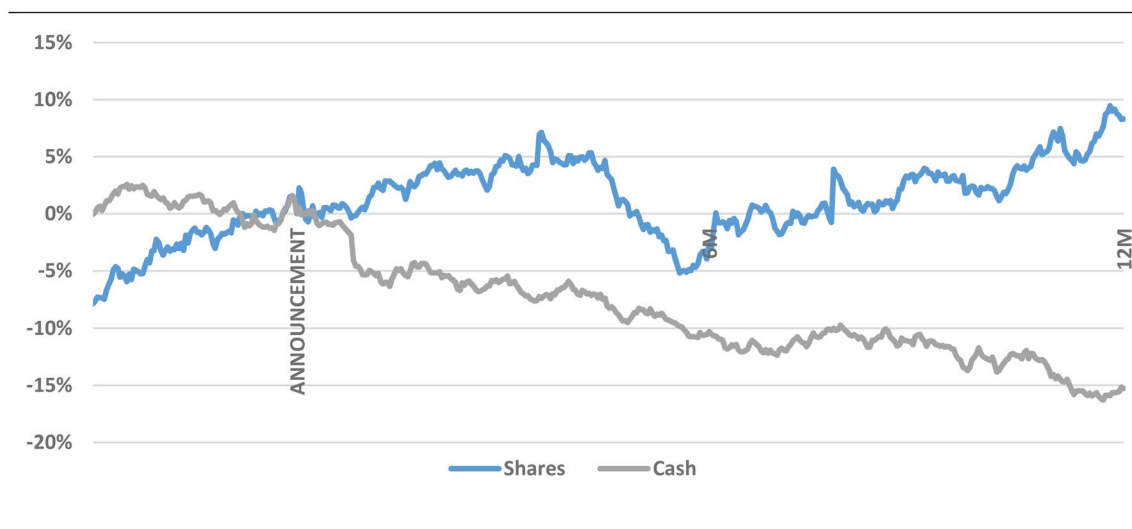


Figure 4. Evolution of the cumulative price return for each sub-set (according to the payment method) from T – 90 to T + 360, using the event as a reference point. (x axis – time, y axis – share price performance).

Second, the cumulative abnormal returns of the acquirer are compared to the market's evolution (Table 5 and Figures 5 and 6).

Table 5. Relative returns of price per share with respect to the market according to different windows of time from the event day.

Date	Complete Sample		Stock		Cash	
	Window	Cumulative	Window	Cumulative	Window	Cumulative
E-90	2.35%	-0.92%	4.43%	-4.15%	1.31%	0.70%
E-60	-0.29%	1.43%	-0.44%	0.28%	-0.22%	2.01%
E-30	-1.14%	1.14%	0.16%	-0.16%	-1.79%	1.79%
Event (E)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
E+30	-3.99%	-3.99%	-2.22%	-2.22%	-4.88%	-4.88%
E+60	0.77%	-3.23%	3.09%	0.87%	-0.40%	-5.27%
E+90	0.39%	-2.84%	1.62%	2.49%	-0.23%	-5.51%
E+120	-0.37%	-3.21%	0.32%	2.81%	-0.71%	-6.22%
E+150	-2.42%	-5.63%	-2.67%	0.14%	-2.30%	-8.52%
E+180	-2.60%	-8.23%	-3.74%	-3.60%	-2.03%	-10.55%
E+210	1.15%	-7.08%	4.98%	1.38%	-0.76%	-11.31%
E+240	1.86%	-5.22%	3.42%	4.80%	1.08%	-10.24%
E+270	-1.47%	-6.69%	-2.51%	2.29%	-0.94%	-11.18%
E+300	-1.02%	-7.71%	-1.04%	1.26%	-1.01%	-12.19%
E+330	1.19%	-6.52%	2.69%	3.95%	0.44%	-11.75%
E+360	0.59%	-5.93%	2.32%	6.27%	-0.28%	-12.03%

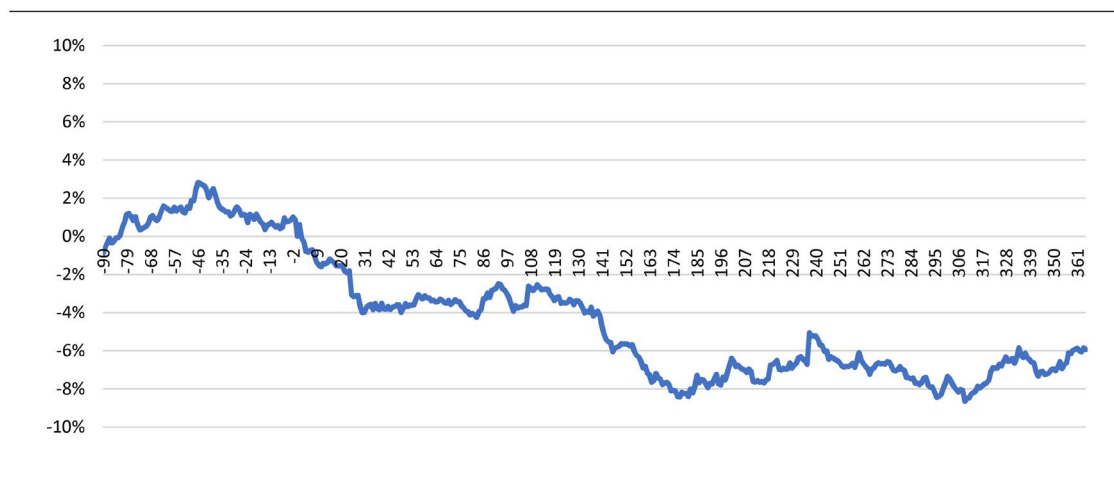


Figure 5. Evolution of the return of the sample share price versus the reference market index of each acquirer from T-90 to T+360. (x axis – duration in days, y axis – share price-index performance).

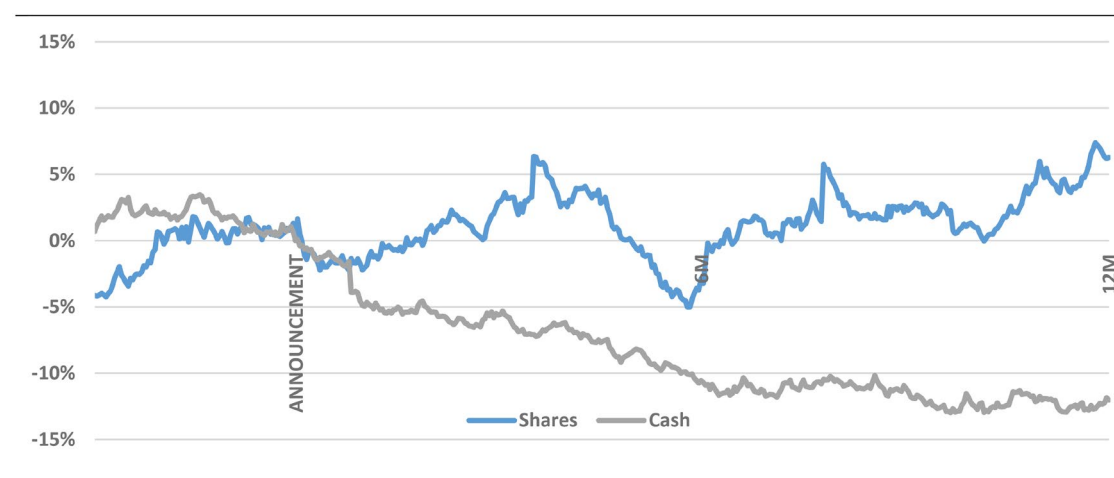


Figure 6. Evolution of the returns of the stocks versus the reference market index for each subsample from E – 90 to E+360. (x axis – time, y axis – share price-index performance).

And third, the cumulative abnormal returns of the acquirer are compared to the estimated expected return as per CAPM and Fama-French-Carhart models, with the announcement of the Transformative Transaction as the event day (Tables 6 and 7).

Table 6. Results for abnormal returns as per the CAPM model.

#	Acquiror	Transaction Date	Country	Payment Form	Expected Return 1 year from Event Date	Stock Evolution After a Year from Event	Difference (Abnormal Return)	Qualitative Difference
1	REE	12-Feb-19	Spain	Cash	4.5%	-6.6%	-11.1%	Worse than expected
2	CIE Automotive	17-Feb-18	Spain	Cash	10.2%	-9.1%	-19.3%	Worse than expected
3	Amadeus	10-Aug-18	Spain	Cash	10.9%	-5.0%	-15.8%	Worse than expected
4	Minor Hotels	5-Jun-18	Thailand	Cash	6.9%	14.8%	7.9%	Better than expected
5	DS Smith	4-Jun-18	Germany	Cash	8.9%	-44.5%	-53.3%	Worse than expected
6	Euskaltel	16-May-17	Spain	Shares	10.2%	-19.4%	-29.6%	Worse than expected
7	Atlantia	21-Apr-17	Italy	Cash	8.8%	22.4%	13.7%	Better than expected
8	Indra	29-Nov-16	Spain	Shares	9.2%	24.5%	15.4%	Better than expected
9	Fresenius	6-Sep-16	Germany	Cash	9.5%	6.0%	-3.5%	Worse than expected
10	Endesa	27-Jul-16	Spain	Cash	5.8%	9.0%	3.2%	Better than expected
11	Merlin	21-Jun-16	Spain	Shares	12.4%	19.7%	7.3%	Better than expected
12	Gamesa	16-Jun-16	Spain	Shares	7.7%	14.4%	6.7%	Better than expected
13	Ferrovial	29-Apr-16	Spain	Cash	8.2%	3.4%	-4.7%	Worse than expected
14	BBVA	27-Jul-15	Spain	Cash	11.9%	-41.3%	-53.2%	Worse than expected
15	Merlin	9-Jun-15	Spain	Shares	10.4%	-5.3%	-15.7%	Worse than expected
16	Sabadell	19-Mar-15	Spain	Cash	9.2%	-14.7%	-23.9%	Worse than expected
17	Vidrala	14-Jan-15	Spain	Cash	6.2%	5.3%	-0.9%	Worse than expected
18	Repsol	14-Dec-14	Spain	Cash	8.6%	-36.9%	-45.5%	Worse than expected
19	Ferrovial, Macquaire	16-Oct-14	Spain	Cash	8.2%	54.1%	45.9%	Better than expected
20	Vodafone	16-Mar-14	UK	Cash	5.8%	0.2%	-5.6%	Worse than expected
21	Grifols	11-Nov-13	Spain	Cash	6.5%	-46.0%	-52.5%	Worse than expected
22	Abertis	5-Aug-12	Spain	Shares	15.5%	40.5%	25.0%	Better than expected
23	Atresmedia	14-Dec-11	Spain	Shares	13.7%	-13.6%	-27.4%	Worse than expected
24	Banco Popular	7-Oct-11	Spain	Shares	14.1%	-57.6%	-71.7%	Worse than expected
25	Schneider	31-May-11	Germany	Cash	13.9%	-24.4%	-38.3%	Worse than expected
26	ACS	1-Dec-10	Spain	Cash	14.6%	-31.6%	-46.2%	Worse than expected
27	Telefonica	28-Jul-10	Spain	Cash	10.0%	-2.6%	-12.6%	Worse than expected
28	Grifols	8-Jun-10	Spain	Shares	8.3%	36.9%	28.6%	Better than expected
29	Telecinco (Mediaset)	18-Dec-09	Spain	Shares	10.7%	-13.5%	-24.2%	Worse than expected
30	Enel	21-Feb-09	Italy	Cash	16.0%	6.1%	-9.9%	Worse than expected
31	Santander	13-Oct-08	Spain	Cash	15.0%	7.3%	-7.8%	Worse than expected
32	Gas Natural	30-Jul-08	Spain	Cash	10.0%	-60.4%	-70.3%	Worse than expected
33	Vueling	7-Jul-08	Spain	Shares	20.5%	53.5%	32.8%	Better than expected
34	Prisa	20-Dec-07	Spain	Cash	8.8%	-83.1%	-91.8%	Worse than expected
35	Iberdrola	25-Jun-07	Spain	Cash	6.8%	-21.8%	-28.7%	Worse than expected
36	Santander, RBS, Fortis	5-May-07	Spain	Shares	10.7%	59.0%	48.3%	Better than expected
37	ACS	19-Mar-07	Spain	Cash	10.1%	-23.6%	-33.7%	Worse than expected
38	BBVA	16-Feb-07	Spain	Shares	10.7%	-30.8%	-41.5%	Worse than expected
39	Colonial	20-ene-07	Spain	Cash	8.8%	-74.1%	-82.9%	Worse than expected

Table 7. Results for abnormal returns as per the Fama and French (1993) and Carhart (1997) model.

#	Acquiror	Transaction Date	Country	Payment Form	Expected Return 1 year from Event Date	Stock Evolution After a Year from Event	Difference (Abnormal Return)	Qualitative Difference
1	REE	12-Feb-19	Spain	Cash	9.7%	-6.6%	-16.4%	Worse than expected
2	CIE Automotive	17-Feb-18	Spain	Cash	20.7%	-9.1%	-29.8%	Worse than expected
3	Amadeus	10-Aug-18	Spain	Cash	29.6%	-5.0%	-34.6%	Worse than expected
4	Minor Hotels	5-Jun-18	Thailand	Cash	-3.9%	14.8%	18.7%	Better than expected
5	DS Smith	4-Jun-18	Germany	Cash	-5.0%	-44.5%	-39.4%	Worse than expected
6	Euskaltel	16-May-17	Spain	Shares	11.2%	-19.4%	-30.7%	Worse than expected
7	Atlantia	21-Apr-17	Italy	Cash	10.7%	22.4%	11.7%	Better than expected
8	Indra	29-Nov-16	Spain	Shares	5.1%	24.5%	19.4%	Better than expected
9	Fresenius	6-Sep-16	Germany	Cash	-0.6%	6.0%	6.6%	Better than expected
10	Endesa	27-Jul-16	Spain	Cash	2.7%	9.0%	6.3%	Better than expected
11	Merlin	21-Jun-16	Spain	Shares	2.2%	19.7%	17.5%	Better than expected
12	Gamesa	16-Jun-16	Spain	Shares	-2.5%	14.4%	16.9%	Better than expected
13	Ferrovial	29-Apr-16	Spain	Cash	2.1%	3.4%	1.3%	Better than expected
14	BBVA	27-Jul-15	Spain	Cash	-25.6%	-41.3%	-15.7%	Worse than expected
15	Merlin	9-Jun-15	Spain	Shares	3.2%	-5.3%	-8.5%	Worse than expected
16	Sabadell	19-Mar-15	Spain	Cash	-29.9%	-14.7%	15.3%	Better than expected
17	Vidrala	14-Jan-15	Spain	Cash	-8.0%	5.3%	13.3%	Better than expected

(Continued)

Table 7. Continued.

#	Acquiror	Transaction Date	Country	Payment Form	Expected Return 1 year from Event Date	Stock Evolution After a Year from Event	Difference (Abnormal Return)	Qualitative Difference
18	Repsol	14-Dec-14	Spain	Cash	-28.2%	-36.9%	-8.8%	Worse than expected
19	Ferrovial, Macquaire	16-Oct-14	Spain	Cash	7.7%	54.1%	46.4%	Better than expected
20	Vodafone	16-Mar-14	UK	Cash	5.4%	0.2%	-5.2%	Worse than expected
21	Grifols	11-Nov-13	Spain	Cash	7.0%	-46.0%	-52.9%	Worse than expected
22	Abertis	5-Aug-12	Spain	Shares	14.6%	40.5%	25.9%	Better than expected
23	Atresmedia	14-Dec-11	Spain	Shares	18.1%	-13.6%	-31.8%	Worse than expected
24	Banco Popular	7-Oct-11	Spain	Shares	7.1%	-57.6%	-64.8%	Worse than expected
25	Schneider	31-May-11	Germany	Cash	6.6%	-24.4%	-31.0%	Worse than expected
26	ACS	1-Dec-10	Spain	Cash	-14.4%	-31.6%	-17.3%	Worse than expected
27	Telefonica	28-Jul-10	Spain	Cash	-14.6%	-2.6%	12.0%	Better than expected
28	Grifols	8-Jun-10	Spain	Shares	3.1%	36.9%	33.8%	Better than expected
29	Telecinco (Mediaset)	18-Dec-09	Spain	Shares	-4.3%	-13.5%	-9.2%	Worse than expected
30	Enel	21-Feb-09	Italy	Cash	13.9%	6.1%	-7.8%	Worse than expected
31	Santander	13-Oct-08	Spain	Cash	18.9%	7.3%	-11.7%	Worse than expected
32	Gas Natural	30-Jul-08	Spain	Cash	-2.1%	-60.4%	-58.3%	Worse than expected
33	Vueling	7-Jul-08	Spain	Shares	-29.3%	53.5%	82.6%	Better than expected
34	Prisa	20-Dec-07	Spain	Cash	-6.1%	-83.1%	-76.9%	Worse than expected
35	Iberdrola	25-Jun-07	Spain	Cash	49.0%	-21.8%	-70.8%	Worse than expected
36	Santander, RBS, Fortis	5-May-07	Spain	Shares	-6.1%	59.0%	65.1%	Better than expected
37	ACS	19-Mar-07	Spain	Cash	29.5%	-23.6%	-53.2%	Worse than expected
38	BBVA	16-Feb-07	Spain	Shares	19.0%	-30.8%	-49.9%	Worse than expected
39	Colonial	20-ene-07	Spain	Cash	26.0%	-74.1%	-100.2%	Worse than expected

Table 4 displays the average acquirer's stock return before and after the transaction, shown both in monthly terms and as accumulated returns over the analysed period. Each series represents the average evolution across the entire sample or each subset, respectively. In the table, 'Window' refers to the evolution within the specified timeframe, while 'Cumulative' indicates the evolution from each date to the event date.

The Figure 3 shows the evolution of the total sample (calculated as average evolution of the acquirers'share performance) in percentage terms from 90 days prior to the announcement of the Transformative Transaction to 360 days after the announcement. It translates numerical data of the previous table into an illustration for a simpler and more direct analysis.

During the 90d prior to the event, the average stock price of the acquirers remained relatively flat. It is when the event occurs (announcement of the Transformative Transaction) that the return begins to decline, reaching a low point around 180d after the event. The decline continues, remaining within a range of approximately 6%–8% for the remaining 180d until T+360.

The payment method is a critical factor in structuring the transaction since it significantly affects the acquirer. The Figure 4 shows the average evolution of the sample in percentage terms, comparing the 90d before the event with the 360d after, breaking down the sample between transactions where acquirers used cash and those where they used stock.

During the 90d preceding the event, acquirers using cash for transactions experienced a sideways stock market evolution, while those using stock showed a positive performance, ranging from 7.5% to the reference value of 0 at the announcement date. In the very short term, just a few days, both groups displayed similar stock price behaviors. However, after this initial period, the stock and cash acquirers began to exhibit divergent behaviors, with these differences becoming more pronounced over time. By the end of the period, the most significant difference was observed: the average return for cash transactions was -15%, whereas stock-financed transactions showed a positive evolution of +8%.

Before conducting the event study, we compared the sample's performance (average share price evolution of acquirers) with comparable stock market indices. Table 5 presents the results, showing the returns of the acquiring companies minus the index returns in monthly intervals, both before and after the transaction. These results are provided in both monthly and cumulative terms, compared to the reference stock market where the companies are listed.

The Figure 5 shows the average evolution of the sample in percentage terms, taking the market effect into account and comparing the year before with the one after.

Figure 5 shows that from the announcement date (day 0 on the horizontal axis), the sample's performance became more unfavorable than the indexes, with a particularly negative trend in the 6 months following the announcement, which was not recovered later.

Figure 6 breaks down the results by payment methods, confirming different behaviors between the sub-sets.

Finally, we calculate the abnormal returns using the two models described in Section 3.3. to estimate the statistical significance of the event

Table 6 shows the one-year estimation of the AR_t as explained in Equation (3).

Out of the 39 analyzed transactions, 28 had abnormal returns for the acquirer that were worse than expected one year after the transaction, while 11 transactions had better-than-expected results. The average abnormal return for the entire sample is -17.6% , with a negative median of -15.7% .

After separating the results by the form of payment, we found the following: For the 26 cash transactions, 22 had negative abnormal returns, while 4 had positive returns, with an average abnormal return of -24.7% and a median of -17.6% . For the stock transactions, 6 had negative returns, while 7 had positive returns, with an average abnormal return of -3.5% and a positive median of 6.7% .

In Table 7 we present the abnormal Returns using the Fama-French-Carhart four factor model to estimate the expected return.

In this case, out of the 39 transactions in the sample, 23 showed the acquirer's one-year returns were worse than the expected returns according to the model. In 16 transactions, the results were better. The average abnormal return for the entire sample is -11.1% , with a median of -8.8% .

When separating the results by the form of payment: For the 26 cash transactions, 17 had negative abnormal returns, while 9 had positive returns. The average abnormal return for this subsample was -19.2% , with a median of -13.7% . For the stock transactions, 6 had negative returns, while 7 had positive returns. The average abnormal return for this subsample was -5.1% , with a positive median of 16.9% .

Comparing the results obtained by both models, the CAPM model shows more negative abnormal returns overall compared to the Fama-French-Carhart model. Cash transactions generally performed worse in both models, but the Fama-French-Carhart model indicated slightly better outcomes. Stock transactions showed more positive outcomes, with the second model reflecting a higher positive median compared to the first.

4.3. Statistical analysis of the applied methodology

The last step of is to confirm the statistical significance of the event study performed, for which a statistical analysis with the Student's t-test for small samples (<100 observations) is conducted, following Mackinlay (1997). The Student's t-test is an appropriate method for small samples that follow a normal distribution, and it aims to validate the previous results and check if there are significant differences between the two data groups.

The results are included for the three assessments that compare: (1) the total sample of Transformative Transactions and each of the subsamples broken down according to the form of payment, cash or shares, (2) the two subsamples against each other, and (3) the abnormal return of the acquirer compared with the expected return as per CAPM model and Fama-French-Carhart four factor model. This test is applied to the share price evolution of the acquirer, as explained below.

As far as the first Student's t test is concerned, we compare if the stock price evolution has been different before and after the event. We propose a null hypothesis (H_0) that the sample has had an equal stock price evolution before and after the event. The alternative hypothesis (H_1) is that the stock price evolution has been unequal, and therefore, the event has had an effect causing the samples to have different behaviors. The following Table 8 shows the results obtained from applying the Student's t-test for significance.

Table 8. Sample comparison before and after the event.

	All Acquirers		Cash Acquirers		Stock Acquirersm	
	Before Event	After Event	Before Event	After Event	Before Event	After Event
Average stock Price evolution	-2.6%	-7.4%	0%	-15%	-7.8%	8.3%
Variance	0.02	0.11	0.01	0.10	0.02	0.12
Number of observations	39	39	26	26	13	13
Pearson correlation coefficient	-0.45		-0.21		-0.68	
Hypothetical difference of the means	0		–		0	
Degrees of freedom	38		25		12	
t-statistic	0.72		2.19	–	1.29	
$P(T < t)$ one tail	0.24		0.02		0.11	
Critical value of t (one-tailed)	1.69		1.71		1.78	
$P(T \leq t)$ two tails	0.47		0.04		0.22	
Critical Value of t (two-tailed)	2.02		2.06		2.18	

According to the Student's t-test results for the whole sample, the critical values are not significant. Therefore, it cannot be concluded that there is a difference in the stock price evolution of the sample before and after the event. Thus, the event does not have a significant impact on the acquirer's stock price evolution. The null hypothesis (H_0) is accepted. Two-tailed p -values of 0.47 are used for these conclusions since the sample can have both positive and negative results. However, we compare the stock price evolution before and after the event splitting the sample into two subsets to detect differences between the subsamples.

For both sub-samples, the t-test's null hypothesis (H_0) is that stock price evolution before the event is similar to after the event. The alternative hypothesis (H_1) is that the evolution is different, indicating a significant impact from the event. For the cash acquirers' subsample, H_0 can be rejected at the 5% level with a p -value of .04, indicating a significantly unfavorable post-transaction stock price evolution. Before the transaction, the average return was around 0%, while after, it decreased by an average of 15%. The statistical test confirms the significance of these results. In the stock payment subsample, although there is a notable difference before and after the event (−7.8% vs. 8.3%), the statistical significance is not strong enough to confirm an impact on stock prices. The p -value for the entire sample is .47, while for the stock subsample, it is 0.22, indicating better results than the entire sample but not statistically significant.

As far as the second Student's t test is concerned, we compare the two subsamples and the stock price evolution after 360d of the event is analyzed for cash and stock acquirers. Although the number of observations in each is different, 26 for cash and 13 for stock, the variances are similar, so the Student's t-test can also be applied.

The null hypothesis (H_0) proposes that the two subsamples have similar behaviors after the event, while the alternative hypothesis (H_1) suggests they differ. Behavior is measured by the stock price evo-

Table 9. Comparison of stock price evolution 360d after the event between cash and stock subsamples.

	Cash	Shares
Average stock price evolution	−15.3%	8.3%
Variance	0.10	0.12
Number of observations	26	13
Pearson correlation coefficient		0.1045
Hypothetical difference of the means		0
Degrees of freedom		37
t-statistic	−2.15	
P($T < t$) one tail		0.02
Critical value of t (one-tailed)		1.69
P($T \leq t$) two tails		0.04
Critical Value of t (two-tailed)		2.03

lution of the acquiring companies. The following Table 9 summarizes the results obtained.

We confirmed that the two samples exhibited different behaviors after the event. Statistically, we can reject H_0 at the 5% level, with a two-tailed p -value of .04, indicating that the populations are distinct. These results point to stock payments being significantly more advantageous, with an 8.3% increase in performance for stock payments compared to a -15.3% decrease for cash payments.

Finally, on the third Student's t test, we compare the acquirer's abnormal stock price evolution after 360d of the event analyzed for cash transactions and, on the other hand, for stock transactions. The null hypothesis is that the two subsamples have had similar behaviors after the event (H_0), and the alternative hypothesis is that the behaviors of the subsamples are different after the event (H_1). We measure behaviors as the abnormal stock price evolution of the acquiring companies compared with expected return as per the CAPM Model and with Fama French Carhart four factor model (Table 10).

Table 10. Comparison of the abnormal stock price evolution in the two subsamples after the event compared with expected return as per the CAPM model and Fama French Carhart model.

	Abnormal vs CAPM		Abnormal vs Fama-French-Carhart	
	<i>Cash</i>	<i>Stock</i>	<i>Cash</i>	<i>Stock</i>
Average abnormal stock price evolution	−24.7%	−3.5%	−19.2%	5.1%
Variance	0.10	0.12	0.12	0.19
Number of observations	26	13	26	13
Pearson correlation coefficient	0.1052		0.1398	
Hypothetical difference of the means	0.000		0.000	
Degrees of freedom	37		37	
t-statistic	−1.916		−1.911	
P(T < t) one tail	0.032		0.032	
Critical value of t (one-tailed)	1.687		1.687	
P(T ≤ t) two tails	0.063		0.064	
Critical Value of t (two-tailed)	2.026		2.026	

It is confirmed that we can reject the hypothesis that both samples had similar behaviors after the event. Statistically, we can reject H_0 at the 5% level with a one-tailed p -value of .03 in both tests comparing abnormal returns to CAPM and Fama-French-Carhart expected returns. Additionally, we can reject H_0 at the 10% level with a two-tailed p -value of .06, indicating that the populations are different.

This further confirms all previous results that stock payment is significantly more attractive in the long term for the shareholders of the acquiring company, with a difference of more than 20% in performance. The attractiveness has been measured as the stock price evolution one year after the announcement of the transaction.

To wrap up this section, we compare and summarize the findings:

- Overall sample impact. The t-test results for the entire sample indicated no significant difference in stock price evolution before and after the event. The null hypothesis (H_0) was accepted, with a two-tailed p -value of .47, suggesting the event did not significantly impact the acquirer's stock price.
- However, for cash payment transactions, the null hypothesis (H_0) was rejected at the 5% level, with a p -value of .04. This indicated a significantly unfavorable stock price evolution post-transaction, with average returns decreasing by 15% after the event.
- This was not the case for the stock payment subsample. Although there was a notable difference in stock price evolution before and after the event (−7.8% vs. 8.3%), the statistical significance for the stock payment subsample was not strong enough to confirm an impact (p -value of 0.22). However, stock payments showed better results than the overall sample.
- When comparing cash vs. stock acquirers, the two subsamples exhibited different behaviors after the event. H_0 was rejected at the 5% level, with a two-tailed p -value of .04, indicating distinct populations. Stock acquirers' were significantly more advantageous, with an 8.3% increase in performance compared to a −15.3% decrease for cash payments.
- Finally, the analysis of the abnormal returns confirmed that the two subsamples had different behaviors post-event. H_0 was rejected at the 5% level with a one-tailed p -value of .03, and at the 10% level with a two-tailed p -value of .06, in tests comparing abnormal returns to CAPM and Fama-French-Carhart expected returns. This reinforced the finding that stock payments are significantly more attractive in the long term.

5. Conclusion and discussion

This paper adds to the existing body of research about a crucial decision in corporate transactions: the choice of the payment method. Despite a wealth of literature in this domain, there are still challenges to be addressed, like those related to measuring long term performance or analyzing the effect of country specific features. In the words of Ismail and Krause (2010): 'there is still a significant gap in our understanding of the determinants of the payment form.'

In order to better estimate the long-term impact of the M&A deal on the acquirer's return, we introduced the concept of Transformative Transactions that allowed us to construct a homogeneous sample, without contaminating events, comprised of 39 comparable transactions from 2007 to 2019, in which either the buyer or the target were Spanish. The sample distinguished two sub-sets depending on the method of payment: cash (26 deals) and stock (13 deals).

We first perform a descriptive analysis on the sample, that show superior historical performance for stock transactions. We then perform an event study in which we measure the impact of the Transformative Transactions on the buyer's return, as well as the effect of the method of payment. The tests were conducted looking at the acquirer's absolute return, its relative return compared to the market's, and its abnormal return computed as per the CAPM and the Carhart (1997) four factor model which incorporates the Fama and French (1993) model. All cases confirm that Transformative Transactions have a substantial impact on the acquiring company's stock price, and that transactions with a stock consideration consistently outperform those paid in cash. Our findings have statistical significance.

These results contradict most of the existing studies analyzing the acquirer's return depending on the method of payment. Despite works like Mitchell and Stafford (2000) question these results on the grounds that merger observations are not statistically independent, most existing literature show that returns are negatively related to stock payments *vis a vis* cash payments. This effect appears to happen when looking both at short-term (Amihud et al., 1990; Asquith et al., 1983; Franks et al., 1991; Huang & Walkling, 1987; Peterson & Peterson, 1991; Savor & Lu, 2009; Travlos, 1987; Wansley et al., 1983) and long-term performance (Agrawal et al., 1992; Linn & Switzer, 1994).

Looking at this overwhelming empirical evidence, some intriguing questions arise, as stated by Eckbo et al. (1990): Why would some managers opt for stock as the payment method in acquisitions despite clear evidence predicting a negative market reaction, while others choose cash, which has no such negative effect? Are managers who choose stock unaware of or unconcerned with the empirical findings? Alternatively, are managers who select cash more knowledgeable and more focused on protecting the owners' interests?

We believe, in line with the same authors (Eckbo et al., 1990), that managers act in the owners' best interests, and try to anticipate how the market will react to their chosen payment method, weighing the benefits and costs. Therefore, managers utilize their private information to foresee market reactions and opt for the payment method expected to yield a higher abnormal return. And our test shows that the market reaction is taking into consideration several factors that can explain the choice of payment. In other words: the market is becoming savvy to different motivations behind management's decision for a certain form of payment and is not unduly penalizing stock transactions.

Among the already mentioned traditional factors influencing the choice of payment, like information asymmetry about the bidder's stock valuation, there were tax considerations. Since there is a tax disadvantage linked to cash transactions (Ayers et al., 2003, 2004), the probability of cash transactions decreases with capital gain tax. Also, several works show a link between high capital gain taxes and higher premiums paid in cash deals to compensate selling shareholders (Ayers et al., 2003; Brown & Ryngaert, 1991; Sullivan et al., 1994; Wansley et al., 1983). As Shleifer and Vishny (2003) remind us, a key ingredient in the choice for the means of payment are synergies that the market perceives in the merger. Ultimately, an M&A deal creates value if the synergistic gains more than offset the premium paid, so if cash deals entail higher premiums based on tax considerations, it could make sense that the market reacts positively to lower premium transactions, especially in jurisdictions with high capital gain tax, like Spain.

Other explanations could be related to the features of Transformative Transactions that comprise our sample. Due to the restrictive criteria applied to our definition, these transactions involve long integration periods, and probably a large relative size of the target vs. the bidder, which could impact the acquirer's capital structure in case a cash payment was chosen, jeopardizing its future growth opportunities.

Huang et al. (2012) highlight the fact that integrating two merging firms is costly, time consuming, and synergy gains will not be realized immediately. Firms expecting a longer integration period will need to reallocate more resources, delaying synergy gains. Thus, acquirers should adopt a conservative capital structure, entailing lower leverage and a larger fraction of equity, before, during, and immediately after the merger when the integration period is expected to be costly and lengthy. A long integration period is often related to the relative size of the target vs. the buyer, which will also condition the form of

payment (Draper & Paudyal, 2006; Grullon et al., 1997; Hansen, 1987; Martin, 1996; Swieringa & Schauten, 2007) and affect the leverage ratio. The financial constraints of the buyer, coupled with its growth prospects, could also affect the means of payment, making them lean towards stock instead of cash, to keep the company's financial slack (see Faccio & Masulis, 2005; Huang et al., 2012; Harford et al., 2009; Masse et al., 1990; Uysal, 2011; Vermaelen & Xu, 2014 for the effect of leverage and Boone et al., 2014; Martin, 1996; Swieringa & Schauten, 2007; Zhang et al., 2003 for how higher investment opportunities for the buyer lead to an increased use of stock financing in corporate acquisitions). Since this is the case with Transformative Transactions, we believe it justifies why the market favors stock deals.

Finally, and as pointed out by Kothari and Warner (1997), whether the apparent abnormal returns are due to mispricing, or simply the result of measurement problems is an unresolved issue among financial economists, related to the joint hypothesis issue.

We believe our empirical study on the effect of M&A consideration contributes to the literature with a novel way to filter corporate transactions so as to build a homogeneous database that will help to properly assess long term effects. It also adds to an increasing body of works that focus on local geographies with similar legal and institutional frameworks in order to separate country specific factors that affect market performance, and therefore increasing again the comparability of transactions in the sample. Finally, we show how the unexpected performance of stock deals vs cash deals is rooted in the literature and may be pointing at the market's deeper understanding of management's motivations. Our findings, if further confirmed, have an impact on corporate managers as well as investors.

Note

1. Data from BCG (2023) M&A Report.

Authors contribution

Jesús Reglero: conceptualization, design, data curation, and analysis, writing of the first draft.

Teresa Corzo Santamaría: revising the draft and extracting the main conclusions from the analysis as well as challenging the first draft obtaining a critical revision to improve the intellectual content and academic attractiveness.

Rocío Sáenz-Diez: assisting in the initial phase of conceptualization, revising the drafts, including a critical analysis of the reviewers' comments to improve content, academic attractiveness.

All authors had contributed to the final draft. The final version of the paper has been equally approved by all authors and all authors agree to be accountable for all aspects of the work.

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Data availability statement

The data that support the construction of the Sample of Transformative Transactions, which are the base of this study are openly available in Harvard Dataverse at <https://doi.org/10.7910/DVN/2WK6ON>.

The data that support the findings of this study are available from the corresponding author, JR, upon reasonable request.

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Appendix A

Table A1. Sample of transformative transactions.

Year	Acquiror	Target	Sector Target
2019	REE	Hispasat	TMT
2018	CIE Automotive	Inteva Roof Systems	Industrial
2018	Amadeus	TravelClick	TMT
2018	Minor Hotels	NH Hoteles	Tourism
2018	DS Smith	Europac	Industrial
2017	Euskaltel	Telecable	TMT
2017	Atlantia	Abertis	Infrastructure
2016	Indra	Tecnocom	TMT
2016	Fresenius	Quironsalud	Health
2016	Endesa	Enel Green Power	Energy
2016	Merlin	Metrovacesa	Real Estate
2016	Gamesa	Siemens Wind Power	Energy
2016	Ferrovial	Broadspectrum	Infrastructure
2015	BBVA	Garanti	Banking
2015	Merlin	Testa	Real Estate
2015	Sabadell	TSB	Banking
2015	Vidrala	Encirc	Industrial
2014	Repsol	Talismann	Energy
2014	Ferrovial, Macquarie	NDH1	Infrastructure
2014	Vodafone	Ono	TMT
2013	Grifols	Novartis (filial)	Pharmaceuticals
2012	Abertis	OHL Brasil	Infrastructure
2011	Atresmedia	La Sexta	TMT
2011	Banco Popular	Banco Pastor	Banking
2011	Schneider	Telvent	TMT
2010	ACS	Iberdrola	Energy
2010	Telefonica	Vivo	TMT
2010	Grifols	Talecris	Pharmaceuticals
2009	Telecinco (Mediaset)	Cuatro + 22% Digital Plus	TMT
2009	Enel	Endesa	Energy
2008	Santander	Sovereign Bancorp	Banking
2008	Gas Natural (Naturgy)	Union Fenosa	Energy
2008	Vueling	Clickair	Tourism
2007	Prisa	Sogecable	TMT
2007	Iberdrola	Energy East	Energy
2007	Santander, RBS, Fortis	ABN Amro	Banking
2007	ACS	Hochtief	Construction
2007	BBVA	Compass	Banking
2007	Colonial	Riofisa	Real Estate