

AN EMPIRICAL ANALYSIS OF M&A BIDDERS' PROFITABILITY: THE IMPACT OF FINANCIAL AND SOVEREIGN DEBT CRISES

*Part 1: Analysis of M&A bidders' profitability in the
Nordic market*

*Part 2: Analysis and comparison of M&A bidders'
profitability in the Italian market*

Mirko Battini

Master of Science Thesis

Università commerciale L. Bocconi & Stockholm School of Economics

2021

Analysis of M&A bidders' profitability in the Nordic market

Mirko Battini

Master of Science Thesis, Part 1

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2021

Abstract:

Expert often wonder what is the best time to announce an M&A. It is well known that M&A bidders usually register a negative stock performance at the transaction announcement. This study aims to investigate if the bidders' performance improves when the M&A is announced during a crisis period. This research considers the financial crisis (2008 – 2010) and the sovereign debt crisis (2011 – 2012) and it is focused on the less studied Nordic market.

To test the hypothesis that bidders performed better in these periods it is first analyzed the Nordic market to identify some M&A trends. Then, the study proceeds with an in-depth analysis of bidders' absolute, abnormal, and cumulative abnormal returns. The study is based on both statistical evidence and a series of regression analyses which aim to identify the market or accounting variables that explain bidders' returns. The results showed a difference between the two crises based on the severity of the crisis, however buyers' ARs and CARs are not statistically significant. The only exception regards financial crisis CARs, which are slightly positive and significant. In terms of variables' explanatory power, the market seems unable to explain bidders returns at the announcement, even though the regression significance increases with time and seems related to the crisis magnitude. Moreover, bidders' CARs are mainly explained by companies' cash flows and leverage, while the size, the sector and the profitability do not significantly impact.

These results confirm that on average M&A bidders have a negative stock performance at the announcement of the transaction. However, the fact that this is one of the first studies on the Nordic market and the positive CARs observed during financial crisis open the possibility for further research especially now that we are exiting another crisis scenario.

Keywords:

M&A, bidders' profitability, crisis, Nordics

Author:

Mirko Battini

Tutors:

Stefano Gatti, Antin IP Professor of Infrastructure Finance, Department of Finance, Bocconi University

Pieralberto Guarniero, Professor, Department of Decision Sciences, Bocconi University

Master of Science Thesis

Master of Science in Finance

Università commerciale L. Bocconi

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1. Introduction

The study aims to investigate the bidders' profitability in the process of Mergers and acquisitions (M&A). It is focused on the less discussed Nordic market and analyzes the financial crisis cases (2008 – 2010) and the sovereign debt crisis (2011 – 2012). There is a vast literature on the topic, with different, and sometimes contrasting, results. However, one common conclusion is that, on average, M&A bidders register a negative abnormal return, while sellers usually gain from the transaction. Moreover, despite many other aspects to consider, such as the payment methods, the deal typology (tender offer or not), competitions, and expected synergies, the result seems to be always negative for buyers.

Therefore, this research studies if this conclusion is valid in two specific circumstances. Firstly, it investigates the possible impact on bidders' profitability that merging during crises may have. Secondly, it focuses on the growing Nordic market, which is characterized by specific trends. These two aspects have been only partially studied by the current literature and are rarely considered together. Moreover, the decision to study this market relies on a personal experience in Sweden. It allowed me to better understand the market and collect opinions of active M&A advisors in the region. They confirmed and suggested further investigation on the Nordic market profitability, especially during distressed periods.

After an initial review of the available literature, it is presented a current outlook on the Nordic M&A market. It is supported by an analysis of the last 15 years' trends, based on a sample that collects all the transactions concluded in this period. The same sample is then revised to consider only those transactions announced during the financial and sovereign debt crises. In total, it is composed of 128 observations. The analysis is divided into three different steps. Firstly, it aims to study the peculiarities of M&A trends during crisis periods in the Nordic market. It is followed by in-depth research of bidders' profitability, starting from bidders' absolute returns. Then, they are compared with the Abnormal Returns and the Cumulative Abnormal returns to observe if different results can be concluded for the Nordic market.

Finally, the paper concludes by studying the determinants of the bidders' returns. The approach is mainly based on several regression analyses, including the buyers' absolute returns, ARs, and CARs as dependent variables. The regressors used in the analyses are divided between market and accounting variables.

2. Literature review:

This study aims to verify if, in the Nordics market, bidders' profitability in a Merger and Acquisition (M&A) process increases as a consequence of the investment timing. Specifically, to test if announcing a merger or an acquisition during a crisis may benefit their profitability measured in stock returns.

The studies related to M&As' profitability will be discussed to report some common conclusions valid for our analysis. These will then be used to check the hypothesis that merging during distressed periods brings higher returns in the Nordics. Finally, this chapter concludes with an analysis of the Nordic market, which is helpful to explain its peculiarities and the current M&As activity in the Nordics.

2.1 The importance of M&As

This section aims to prove this project's newness as M&As operations are increasing in importance and are becoming more common in the companies' development strategies. The increase in competition and globalization makes it always more difficult for companies to grow organically. Therefore, the alternative and most common option is a merger. It is beneficial for developing, acquiring technologies and assets, and expanding in new markets. Additionally, there is evidence that after the COVID-19 crisis, companies will likely merge as a response to the situation.

M&As are increasing every year in all industries, becoming one of the most common ways for a company to grow. Moreover, a study from R. Berger published in the Journal of Applied Corporate Finance indicates how important are M&As for growth strategies and for reaching different purposes.

Companies are always more frequently going public through reverse mergers into Special Purpose Acquisition Companies (SPAC) rather than following the usual IPO process. SPACs are listed companies managed and run by expert managers able to guarantee good returns for investors. They attract capital with the only scope to merge with an operating company.

This method for going public was already present in the market since the 1990s, but it is now becoming more popular. The reason is that it offers a way to go public to companies which – especially in crisis periods – may have some troubles. For instance, it provides a readily available source of cash to be injected into the operating company together with a set of experienced management.

The success of this type of transaction is empirically evident from the number of deals concluded with SPACs to get public. From 2003 to 2008, the number of SPACs mergers increased relatively to the whole number of transactions done to be public (including IPOs and spin-offs). Specifically, it started around 0.4% of total deals, arriving at almost 22% in 2008. This information is relevant not only for companies and stock markets, which can benefit from an additional – and favorable, especially under some circumstances – way to get public but also for this study. This new method has, as a consequence, an increase in the number of M&As concluded, especially in crisis periods. Consequently, it supports the thesis that mergers completed in market downturns are more in terms of numbers and probably more profitable. Indeed, even if the traditional IPOs will remain the most common and preferred way to go public, SPACs transactions increase their popularity, especially in emerging markets and for those companies with special conditions that would make a traditional IPO more difficult.

Additionally, a study recently conducted by PricewaterhouseCoopers (PWC) confirms the relevance of the research. It describes how the number of mergers and acquisitions is expected to increase during the next six to twelve months, resulting from companies' accumulation of cash and marketable securities during the last year to respond to the current crisis.

Similarly, according to an article published the last October in the Italian newspaper *// Sole 24 Ore*, in this period of financial instability, it is essential to support the government investments – also made with the European funds – with private investments. These investments can be made thanks to the unique and rare macroeconomic environment that we are experiencing now. The abundance of available liquidity, the rapid and supportive fiscal policies, and the low-interest rates help the private investor inject new financing into the market.

Two particular circumstances should be pointed out. First, there is a need to increase trust in the market, which already started to be visible in the US economy with an increment of bond emission and acquisitions. Secondly, experts observed a change in company objectives and business plans. Firms started to focus on their operational business, improving their business models, and customers and governments changed their behavior. Hence, the market is now ready and favorable to incentivize investments and developments in businesses' structures.

In conclusion, since the current market timing seems the most convenient to M&As, this project aims, first, to investigate the convenience – in terms of profitability - for a firm to pursue an M&A transaction. Secondly, this study proposes to research whether a general trend exists regarding the most convenient time to start the operation.

2.2 Analysis of the drivers of M&As' profitability

The purpose of the following paragraph is to provide support in the available literature regarding the profitability of mergers and acquisitions. This research aims to individuate some common trends, which will be then used as a basis in the following empirical analysis. In particular, this study strives to investigate the profitability of M&As during the crisis period.

According to Robert F. Bruner (2003), the profitability of a merger or an acquisition will change based on the definition of "profitable." Indeed, if profitability is defined simply as value conserved, the investment has reached the target rate of return and did not disrupt value (but either created it); it will be much easier to assess it as a successful deal. On the contrary, if profitability is defined as value created – implying a positive NPV with an investor's wealth higher than the required one – the deal has to be more profitable to be described as good.

An additional issue is the difficulty related to the high number of variables involved in an M&A operation's valuation. It is not only the financial reasons behind the decision of a merger, but there might be the will to increase the market share, acquire a new products line, establish a more extensive and more solid customer base, among others. All these factors that impact the financial point of view are also reflected in

many psychological and strategical advantages that are difficult to assess and quantify. Additionally, they may vary based on time and industry segment resulting in a complex comparison among results. Therefore, it is common in the literature to disregard all these aspects in the valuation and focus only on shareholder's returns.

The literature also provides a series of different methods to test the adequate performance of the transaction. It can be based on the share price after the acquisition, it can be compared with a benchmark, or it can be analyzed in contraposition with what it would have been if the deal was not carried out. This paper follows the second approach to avoid all the limitations linked to the first. For instance, the share price might change due to other reasons, such as market shocks, firm news not related to the transition, and other external events. The market is assumed to be efficient: prices will react quickly to new information and incorporate them. Therefore, it will be observed if and when there is free lunch in M&A.

According to the profitability measure definition, only the change in the stock return on the announcement day will be measured. It will disregard any other possible source of profit.

Once assessed the method to determine the profitability of a transaction, it is relevant to investigate the result obtained by previous studies. It will allow understanding the general trend followed by M&As operations and make predictions about the possible paper's conclusions.

Despite the different comprehensive set of results, some general comments may be defined. First, it appears clear that tender offers have a much higher return than the simple merger. As it is a hostile transaction, it will also be more profitable if it is successful. Companies invest much more resources in tender offers – and probably also in hostile deals – resulting in more careful consideration of the target. A deeper analysis is traditionally concluded to spot only those firms with high synergies potentials to compensate for the additional expenses (Burkart and Panunzi, 2006). Secondly, M&As appear to be more profitable for sellers than for buyers, especially if the transaction has been partially paid with equity (Jensen and Ruback, 1983 and Jarrell; Brickley; and Netter, 1988). It may be explained by the propensity of buyers

to buy a new company with shares when they feel these are overvalued. The results are an inflated price paid and a negative stock price performance once the price is realigned to the fundamentals. Both these effects play a negative role in the buyers' profitability assessment. Additionally, the buyer often pays a premium to the selling company, which may account for future synergies and cost efficiency, increasing the returns for selling shareholders. Indeed, under the assumption of market efficiency, the premium paid by the bidders is immediately incorporated by the targets' stock prices, resulting in a positive shock for their stockholders. A report written by Bruner consists of 25 studies that all support the thesis that the return for the target companies is on average positive and statistically significant.

The return for the buyer company is instead more volatile and may depend on many factors. The literature provides many studies with different results; some companies register negative returns, while other positive. Some researchers tried to investigate if the adverse effect also persists after the acquisition for a certain period. Again, the results are different, but the validity of the conclusions may be doubted, as longer performances can be influenced by events external to the transaction or even external to the whole company (market shocks).

According to Mitchell and Mulherin (1996), "poor performance following acquisition is often the signal of economic turbulence in the industry rather than the acquisition itself." Separately, Agrawal and Jaffe (1999) stated that "on average, acquiring firms do not underperform a control portfolio during the first five years following the acquisition. They simply earn their required rate of return". The conclusion, on the buyer side, seems to be that they are essentially break-even.

Moreover, it must also be considered the size issue. Bidders are typically more significant in terms of company size than the seller. Therefore, every extra dollar of dividend paid after the acquisition divided proportionally between all the shareholders (both the buyer and seller companies' ones) has a lower benefit on bidder shareholders, which are traditionally more fragmented than the seller's ones. Thus, the percentage gain to them would be smaller than the one of targets.

Finally, a distinction between glamour buyers with a high book-to-market ratio from value buyers is provided in the literature. It suggests that the latter outperform the former, with a significant difference between them in percentage points.

In conclusion, many studies approach the question regarding M&As profitability, and many answers are given. The results' difference is also explained by many facts, starting from the difference among companies, periods, type of transaction, market considerations, and ways to compute returns. However, all of them seem to agree on the higher return registered by seller shareholders than bidder ones. Moreover, not only do they usually report a lower return, but this is also often negative. This first conclusion will be addressed in the thesis analyzing if – in the Nordic market – this lower return for buyers improves when the operation is concluded during the crisis.

2.3 Sources of profitability in M&A

The discussion proved that this type of transaction has positive results on average, even with some drawbacks for the buyer. However, it is essential to mention the primary sources of profit in M&A to understand both the functioning of this process and why firms pursue this operation. Specifically, this research sets the basis for the following empirical analysis, where the drivers of the buyers' negative returns will be investigated.

First, expected synergies are essential drivers in mergers' value creation as they have many implications for the company's future performances. Some studies identified a significant relationship between the present value of these benefits and the announcement's stock return. Similarly, also restructuring deals, spin-offs, and divestitures results have a positive effect. It is not only the cost reduction or the sale of an unprofitable business that investors better perceive. Instead, it is the continuous reshaping of the business, proving the ability of the management to react quickly to any market change. Indeed, it is not only a signal that the company can promptly respond in case of negative scenarios, but it also proves that it will be able to spot and exploit any opportunity it may face in the future.

Secondly, there are some factors which do not pay. According to the literature, a merger done to consolidate the market position on average does not produce positive returns.

Traditionally, competitors react quickly to the news of a merger, limiting the benefits for the merging entities. Furthermore, the regulation present in the market and the one required in M&A deals reduces the transaction's profitability. For example, a study conducted by Jarrell and Bradley (1980) and Asquith, Bruner, and Mullins (1983) verified that the returns in acquisitions were much higher before the introduction of the Williams Act in the USA.

One other vital point that this study wishes to address is the implications of cash payments when a merger is being done. It is widely known that, usually, cash-rich firms that announce an M&A register a negative response in the stock market. Investors indeed would prefer that this cash is paid out instead of being reinvested through acquisitions. However, some studies (Servaes, Lang, Stultz, and Walkling, 1991; Harford, 1999; and Jensen, 1986) report that the merger between cash-rich and cash-poor companies positively affects the buyer's shareholders. They will benefit from the new – higher – debt to equity ratio of the combined entity. Similarly, value firms, on average, tend to have higher returns. In contrast, glamour, or growth firms (low book-to-market ratio) traditionally register lower returns in M&A. Fama and French (1992) argue that this is explained by the higher risk typical of value firms.

However, other studies (Lakonishok, Shleifer, and Vishny, 1994) provide a different interpretation. The extra return is not the result of the company's riskiness but of evaluating future performance based on past ones. According to this theory, the returns' difference is explained by an incorrect prediction of future profitability, wrongly linked to the past company's profile.

Finally, Ravenscraft and Scherer (1989) and Healy, Palepu, and Ruback (1992) concluded that M&A increases asset productivity, reflected in higher operating cash flows relative to their industry peers. Precisely, these CF dropped during the period analyzed, but they fell less than the peers' ones. This positive effect on the merged companies' cash flows should be reflected in the share price – which according to the

theory, should incorporate the expectation of future CF, thus producing a positive effect for shareholders.

2.4 Analysis of M&A timing

The previous analysis should have clarified the profitability of M&As, especially for the selling company and for tender offers. However, it is also clear that many variables – which will turn into uncertainty – are considered in all these studies. Consequently, it is interesting for a company, which decides to take the risk of the deal to wonder which is the most appropriate time to start the operation.

While there are many studies in the literature which provide information regarding the convenience of M&A, almost none offer an empirical analysis regarding when it is the most favorable moment to do so. Experts widely ask this question in the field as it is an issue many clients of investment banks raise to them. Moreover, the particular current period of financial uncertainty related to the pandemic perfectly suits the case. Many people wonder if, during a crisis, M&A transactions increased and resulted in more profitable deals, but few studies have been developed in this field. For this reason, the study starts reviewing the available literature, which investigates the relation between M&As and the crisis period. These findings should help in understanding and supporting the following analysis.

An examination was done in an article published online by C. Reddy, which explains that the future revenues of a merger or acquisition transaction are related to the economic cycle present when the operation has been concluded. Specifically, three different types of cycles should be discussed.

Firstly, the economic cycle. The buyer would be advantaged in buying the company in the early growth stage when interest rates are traditionally lower. There is a scarcity of liquidity as a consequence of the preceding crisis. These market characteristics will make it easier and cheaper for the buyer to use leverage in the transaction. The lack of liquidity diminishes the competition in the M&A market as fewer companies can finance the operation. On the contrary, the seller is better to operate in the latter part

of the growth phase, when interest rates are higher, and there is much more liquidity in the market with many investors who are willing to buy.

Secondly, there is the business cycle typical of each industry. The situation is similar to the buyer advantaged in the growth stage and the seller in the late growth. In this case, the former can benefit from all the growth opportunities of the target company, which would be much lower in the case of a later merger. However, some of these advantages can be exploited only thanks to the buyer's synergies and support. Indeed, it may happen that the seller can still benefit from selling in an early moment as the company will likely experience a growth rate that could not be achievable without a merger. Additionally, each company participates in a different business cycle in other moments, so a comparison among a sample would be complex and probably lead to more mistakes. For these two main reasons, this study is focused on the impact of the economic cycle and precisely the crisis effect.

The last and third cycle is the product cycle, i.e., product development from the original idea to the actual production and sale. The most profitable moment is, of course, the development phase; when the product is not yet in the market, the competition is probably low, and there is the possibility to exploit the first-mover advantage. However, a probable lower valuation beneficial for the buyer is actually due to the high implicit risk in the transaction. There is the risk that the product will never enter the market, the sales will collapse, and the market fit will be close to zero; therefore, all these risks must be considered. A higher level of risk is required by an efficient market for a lower price and a higher return.

For similar reasons to those expressed above, this cycle must be disregarded in the following analysis. It would be impossible to consider the development stage of each product for all the sample companies. The comparison would not be significant, and the data would not be available.

Another publication by I. Eisenbarth and R. Meckl in 2014 describes how M&As traditionally come in waves and states that we have experienced six waves in the last 18 years. All of them differ on market characteristics and reasons behind the starting and the end of the wave. However, one common point seems to exist: all M&A waves were accompanied by low-interest rates, increasing stock prices, and economic

growth. It means that many companies behave in a procyclical way when merging with another company. Nevertheless, to be profitable, or at least more profitable, companies should exploit an anticyclical strategy, i.e., concluding M&As during the market decline. Again, it appears clear that the timing in completing a merger or an acquisition is crucial for providing a return to the companies' shareholders.

The research shows how, traditionally, M&A decision is taken during an upturn of the capital market cycle and not economically convenient. The study validates that this results in value destruction in the following period when the market reaches the peak and starts to decline. Other than the already mentioned considerations, such as the lower price paid by the buyer and the possibility to get deals that in normal market circumstances would not be available, there is an additional reason for justifying a merger in a downturn period. If we believe in the continued presence of waves in the market, it is clear that a positive trend follows a downturn and vice versa. It implies that an acquisition done during a crisis period will be followed by a period of recovery where we expect positive cash flows. It will consequentially increase the company valuation and, therefore, the operating profitability.

Shleifer published some relevant studies on this topic - Vishny and Rhodes-Kropf – Viswanathan, which explain that M&A waves behave procyclically concerning stock market movements. Specifically, thanks to a temporary market inefficiency, the overvalued bidder buys the undervalued target with its shares benefiting from two aspects. First, the mispricing of the seller – favorable to the buyer – reduces the acquisition price. Secondly, if the buyer uses their shares as a payment method, the company's overvaluation makes the transaction cheaper for him.

However, the biggest challenge is to predict the market wave and when there will be a shock in the market correspondent to a change in the market trend. It is highly crucial to answer this project question and therefore determine the better timing for an M&A. Indeed, if we accept the thesis that it is convenient – especially for the buyer – to pursue the acquisition during a downturn period, it would be necessary for the bidder to understand when the market is shrinking. To answer this question, we propose the table used in the article *Optimizing the Timing of M&A Decisions - An Analysis of Pro- and Anticyclical M&A Behavior in Germany* published in the American Journal of

Industrial and Business Management in 2014. The table offers and summarizes some indicators which can help the reader – and especially the firm management – to understand in which stage of the market wave we are. Specifically, different parameters can be analyzed depending on the market from the company or the macroeconomic perspective.

Although it is undoubtedly not perfect, it is a good benchmark used as a reference and integrated with other analyses and personal experiences.

		<i>Lowest turning point</i>	<i>Upturn phase</i>	<i>Highest turning point</i>	<i>Downturn phase</i>
<i>From the company's perspective</i>	Future expectations/ Profit outlook	- Positive trend - Increasing	- Positive - High	- Negative trend - Declining	- Negative - Low
	Debt burden	High	- Declining: increasing CF (used for debt service) - Increasing: gearing for transactions	Constant in comparison to the upturn phase, with an increasing trend	Increasing
	Liquid assets	Low	Increasing	Constant in comparison to the upturn phase, with a declining trend	Declining until low
	Cashflow	Low	- Positive trend - Increasing	- High - Negative trend	Declining
	Valuation level	Low	Increasing	High	Declining
	Purchase price/ Transaction premium	Low	Increasing	High	Declining
	Capital market/ Stock exchange	Low share prices	Increasing share prices	- High point of the stock exchange - Declining trend	- Stock market crash - Decreasing share prices
<i>The macroeconomic perspective</i>	Economic growth/ GDP	- Cyclical trend towards recovery	- Upward tendency - Expansion	- Economic boom - Decreasing tendency	- Economic slowdown - Recession
	Interest on borrowed capital	Low	Increasing	High	Decreasing With a tendency - during the low point as well as during a long-lasting recession - to decrease further
	Risk-free rate	Low	Increasing	High	Decreasing
	Market risk premium	Low	Increasing	High	- Decreasing if return assumptions are negative - Increasing: higher risk premiums caused by the crisis
	Capital liquidity	Low	Increasing	High	Declining
	Credit conditions	Cheap	More restrictive	Constant in comparison with the upturn period	Restrictive, with a tendency - during the low point as well as long-lasting recessions - towards improvement

Table 1 – Market characteristics benchmark

The table provides a list of market characteristics that companies and managers can use to identify the current market trend. It is a combination of company and macroeconomic descriptions which should identify a specific market moment.

This project investigates the relationship between crises and the number of M&A announced, together with their profitability. Even though the results are expected to

vary according to the industry and company's characteristics, the analysis aims to identify some general patterns. For instance, a study by Mitchell and Mulherin (1996) suggests that that mergers may come as a reaction to unexpected market shocks. A possible explanation may be that companies face more troubles during these periods, and a good solution – which can also benefit the long run - may be consolidation. Additionally, the buyer – traditionally registering the lower profitability rate – may reach a better deal in this market environment thanks to lower valuations related to the unfavorable market environment.

There is proof that mergers tend to be concentrated in some decades - and not in others - is related to these aspects. It helps to explain the typical concentration of M&A operations in some periods and the non-homogeneity across decades as these shocks are – by definition – unexpected. However, it must be pointed out that shocks do mean a "crisis" and a more comprehensive range of events, including new technologies development, unexpected changes in demand/ supply, and deregulation. Another study from M. Martynova, S. Oosting, and L. Renneboog suggests that companies merge when they perform better than their median peer in the industry. It is consistent with the analysis carried out by G. Andrade, M. Mitchell, and E. Stafford, which states that the merger activity is strongly clustered by industry.

Finally, a study published in the Journal of Applied Corporate Finance discusses the impact of fire sales on the companies' profitability during mergers. Specifically, it studies the impact on the buyer's profitability, and as fire sales usually happen during crisis times, the result of this paper can easily be linked to the current research. If buyers in M&As register higher returns during fire sales, it is clear that it will be likely to observe higher returns for buyers during a crisis when fire sales are expected. Moreover, the study also addresses the issue regarding the validity of government buyouts. During a period of economic distress, it is expected that states and governments provide grants and funds to rescue companies that otherwise would fail. However, if it is possible to propose a merger between companies instead of this solution, many citizens' money will be saved. Nevertheless, to be accepted, the merger has to be profitable for the buyer – who is traditionally more penalized in this kind of transaction for the reasons already discussed. In this case, the buyer will likely be unwilling to buy a distressed company if the expected return from the transaction is not

positive and – probably – higher than the expected one in normal market circumstances. This condition can be met thanks to the fire sale: i.e., distressed companies sell their asset at a lower price than the market value. The buyer, in this way, can obtain a lower valuation (price) for the target company, increasing the likelihood of positive returns for its shareholders. It is a sort of wealth transfer from the seller – which traditionally gains in M&A – to the buyer, who can now buy an undervalued company and probably register positive returns.

It is essential to underline that the relevance of this result is not limited to the advantages for the M&A bidder, but it is crucial in deciding whether to bail out a company. If profitable alternatives can be found in the private market, this is preferable for reducing taxpayer expenses and contrasting the moral hazard issue typical of buyouts. To better understand this last point, it is enough to think that if companies believe that – in case of necessity – they will always be bailed out by governments, they will be much more inclined to take risks which would have avoided if this option had not existed. In other terms, the presence of an almost certain alternative to failure makes companies more risk propensity¹.

Therefore, a relevant conclusion for the whole market is that buyers during fire sales – and crisis scenarios – earn abnormal returns at the announcement on average higher than usual acquisition for two percentage points. Specifically, as private equity funds specialized in distressed companies and private companies interested in concluding a good deal will be willing to buy their assets, it increases the overall advantages. It will directly benefit the buyers and the taxpayers to avoid bailouts – and indirectly the distressed sellers and the market. The market benefits from reducing moral hazard and the sellers from the increased demand of their asset and the consequent increase in the price. Moreover, if strategic investors are interested in buying the distressed firm, future positive developments may benefit the market regarding companies' expansions and technology outgrowth. This last possibility is also empirically confirmed, observing that buyers of fire sales assets earn even higher returns in the long run, probably due to better company performances in the market.

¹ Exactly as in the standard microeconomic studies when it is observed that the presence of insurances in the market increases the likelihood of moral hazard and it is therefore suggested to limit the insurance company exposure, to screen the customer and cluster them and to increase the customer co-participation in case of losses.

Finally, buyers earn in fire sales thanks to the reduced bargaining power of the sellers who are forced to reduce the price. However, this advantage is mitigated in the case of industries where many big companies are present. If this is the case, the higher implicit competition in acquiring a distressed firm at the lower price will raise the price, reducing the transaction's profitability. Similarly, if the seller's market is illiquid or has a low number of alternative uses, the buyer's return increases as the buyer's bargaining power decrease. As this happens, especially during a period of financial crisis and market recession, it will be lucky that there is empirical evidence of the link between crisis and buyer higher returns.

The same link has been pointed out in an article published on the *// Sole 24 Ore*, where it is reported that the total return for buyer shareholders is on average seven percentage points higher in acquisitions concluded in periods of economic crisis rather than in typical market situations.

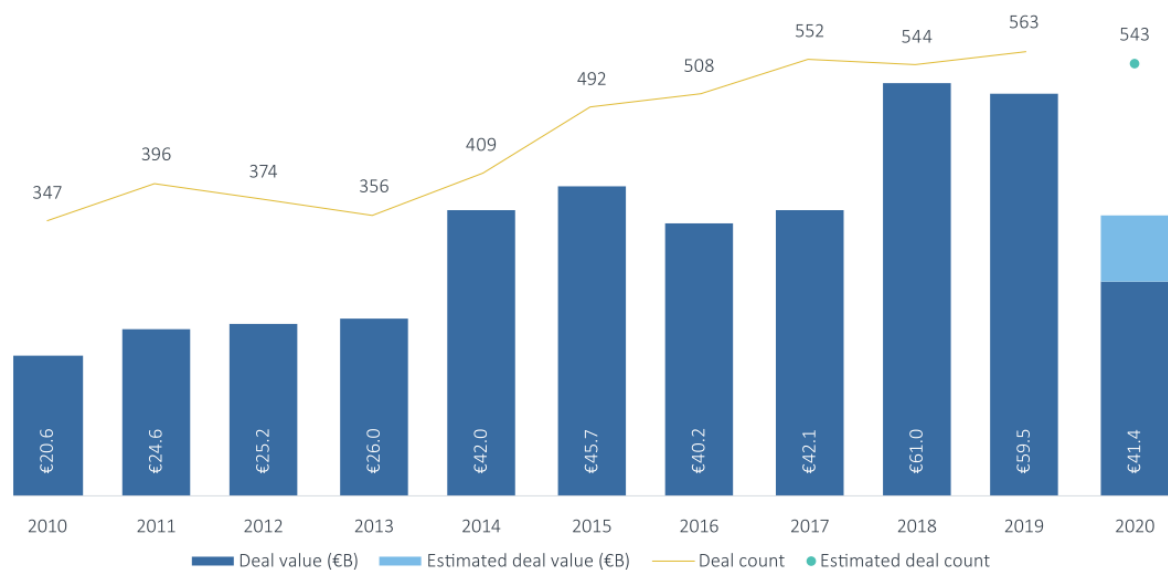
2.5 The Nordic Market

As the research focuses on the less analyzed M&A Nordic market, we investigate its recent magnitude and trends. First of all, it is essential to mention that the Nordic market of mergers and acquisitions is developing quickly, and many financial players are growing in these countries. The study, therefore, results in an interesting and actual investigation on this – relatively new – market.

The Nordic M&As market is sensibly increasing every year, supported by solid demand for PE and strategic investors, together with good companies' fundamentals. In 2019 almost 1200 transactions were concluded for a total value of more than 110 billion euro. The biggest deal in 2019 was the buyout of ExxonMobil's Norwegian upstream assets by Norway-headquartered and PE-backed Var Energi for a total value of €4.1 billion. This transaction has been the target of many PE groups hunting for carveout targets in the Nordic, proving the increment of PE buyout activity in the Nordic, which now accounts for 34.7% of the total Nordic M&A market.

Figure 1 - PE deal activity

The figure reports for the period 2010 – 2020 the deal value and the deal count of PE transactions concluded in the Nordic market. Also, for 2020 a forecast is present as the final data were not available.



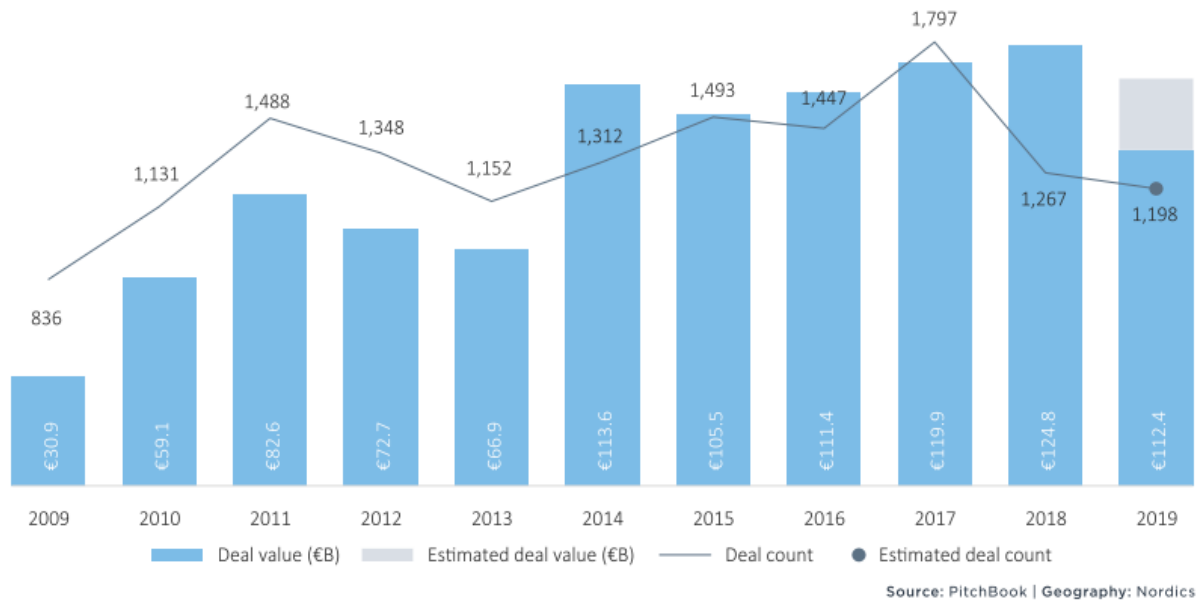
Source: PitchBook | Geography: Nordics

This trend is also evident by analyzing the last 15 years' M&A transactions, according to the sample discussed in Chapter 4.1. Indeed, among the ten most active buyers (by value) in the last 15 years, it is possible to count at least 3 PE: EQT Partners, Bain Capital PE, and Ahlström Capital Oy. In terms of the number of transactions, the most active players in the last 15 years have been pension and private funds.

The increment of PE investors went alongside the increment in the number of M&A transactions. The strong relationship with the EU and the US, together with the Brexit, which has favored the reduction of tariffs for the Nordic region, supported the region's positive M&A trend of the last years. Moreover, the end of the US-China trade war and the positive macroeconomic outlook set the basis for an excellent future pipeline. In 2009 the total amount of M&A transactions was 836, while in 2018, it was 1267, registering a CAGR of 4.25%, with the IT and Software sectors as leaders.

Figure 2 - Nordic M&A activity

The figure reports for the period 2009 – 2019 the deal value and the deal count of M&A transactions concluded in the Nordic market. Also, a forecast for 2019 is present as the final data were not available.



Valuations in these industries are among the highest, with a spread of EBITDA multiples ranging between 7x (Telecom) to 16x (Software industry). The most active M&A sector by value has always been the B2B segment since 2009, consistently accounting for more than 30% of the overall value. It is followed by financial services (around 15-20% depending on the years), which slightly decreased in the last years for leaving space to the emerging energy sector. The IT sector is also increasing since 2017, together with the healthcare one. However, these last sectors and the Material & resources one account for the smaller percentage value.

The same analysis has been conducted on our sub-samples (illustrated in chapter 4.1) which considers the Nordic M&A transactions over the last 15 years.

Figure 3 - Nordic M&A (#) by sector (Absolute value)

The figure reports for the period 2006 – 2021 the deal breakdown by sector in the Nordic market. The values are computed as the number of operations concluded in each sector over the total number of transactions. Data are based on a sample of 1495 transactions and are reported in absolute values. Figure 3.b reports the same information in percentage terms.

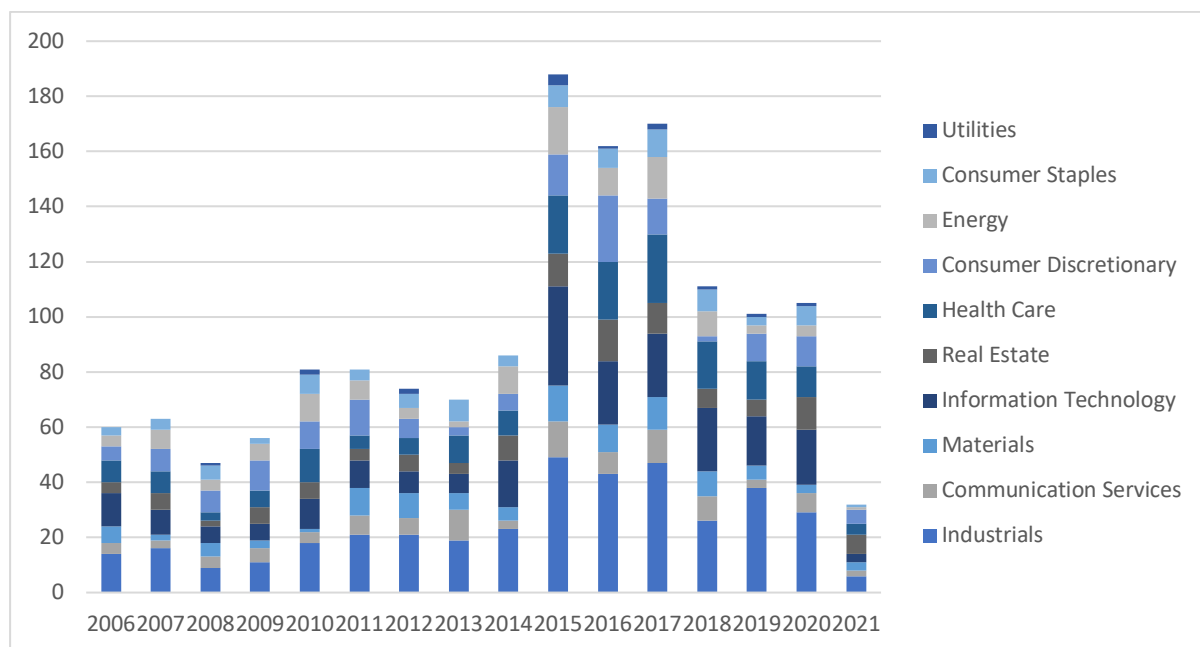
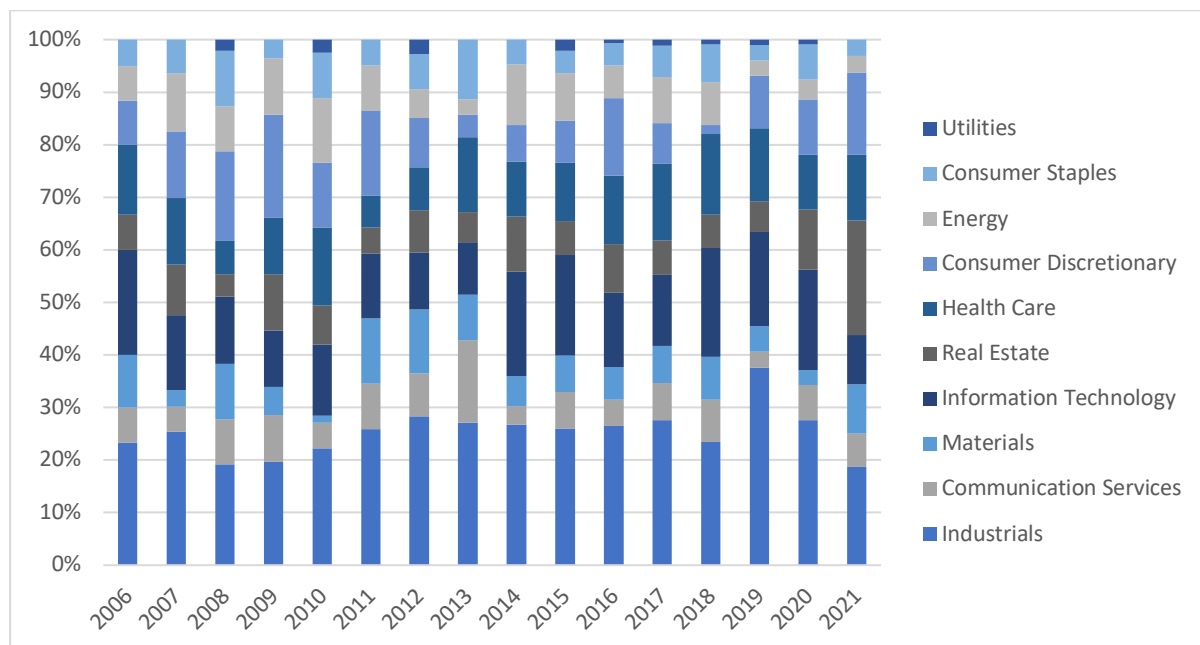


Figure 3.b - Nordic M&A (#) by sector (Percentage)



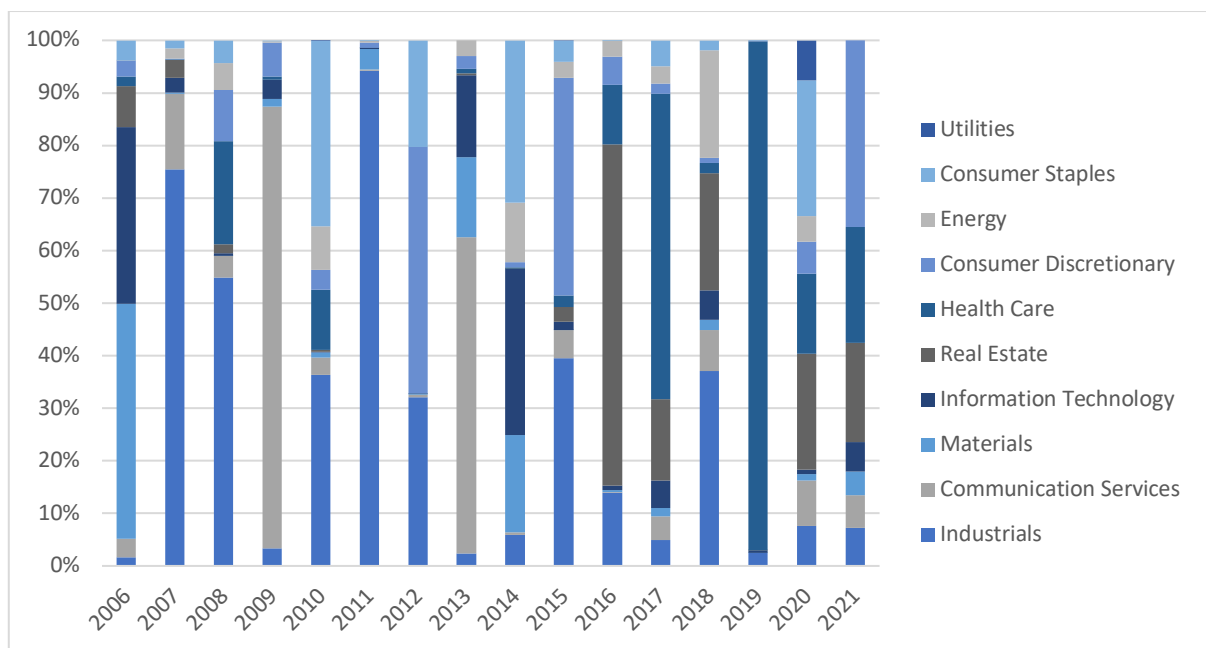
Some common trends are identifiable even though it is impossible to complete a punctual comparison as the two samples include different industries' classification. The leading industry is always the industrial one, which belongs to the B2B category of the previous graph. Moreover, the paths of the IT and Energy sector are pretty aligned

between the two samples. Analogously, the Health Care and the Consumer Staples sectors are increasing their market share in the last few years.

We also studied how transaction values are spread among the different industries in different years.

Figure 4 - Nordic M&A (€) by sector (Percentage)

The figure reports for the period 2006 – 2021 the deal breakdown by sector in the Nordic market. The values are computed as operations value transacted in each sector based on the total number of deals. Data are reported in percentage terms.



Although there is no information on the total deal value of many of the transactions present in the sample (composed of 1495 deals), some common paths are still observable. First, there is not an industry that prevails every year. On the contrary, the relative weight of each industry changes in every sub-period. However, among those that have been more active – by total deal value – in the last 15 years emerges the Industrial sector, which also prevails by deals number. Instead, the Real Estate, IT, and Health Care registered high picks to return to average values in some years.

Particular attention is deserved by the IT sector, which portion of the M&A market is increasing (around 23%), and it accounts for 32% of intra-sector deals. Only in Sweden, the IT deals accounted for more than €20 billion. This industry is described as the European startup capital.

Figure 5 - Same sector M&A (#) as portion of total M&A

The figure reports the number of same sector M&A transactions concluded in the period 2009 – 2019. The values are reported in percentage terms over the total number of transactions concluded in the reference years.

The increasing importance of the IT sector is evident also from our analysis. By observing the last 15 years sample, the IT industry ranked as the second most active one followed by the Health Care Industry in 2006 – 2021. The leading position goes instead to the Industrial industry.

Moreover, same-sector M&As are increasing and in 2019 peaked, accounting for almost 44% of the total market value. It has been read as a signal of industry consolidation in this market.

By studying the same statistic in a sample that includes only the domestic operation, we obtain similar information. It comprises 790 transactions, but there is information about the target and seller's industry for only 332 transactions. Out of these, 187 (56%) have

been conducted in the same sectors. Additionally, by considering the broader sample of 1487 transactions (the same of chapter 4.1), the results are similar.

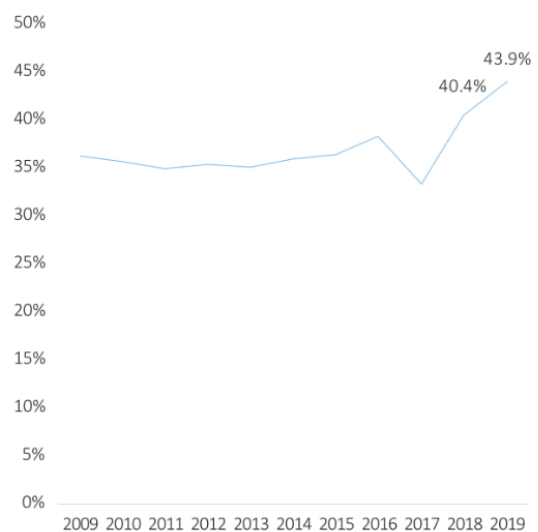


Figure 5.b - same sector M&A deals (#) as a portion of total M&A

The figure reports the exact information of figure 7 in the extended period 2006 – 2021. It is based on a sample made of 790 transactions.

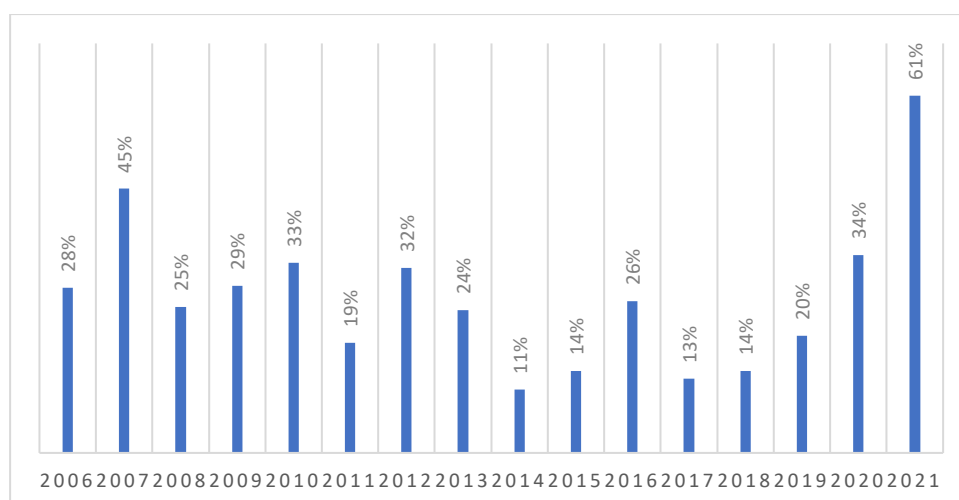
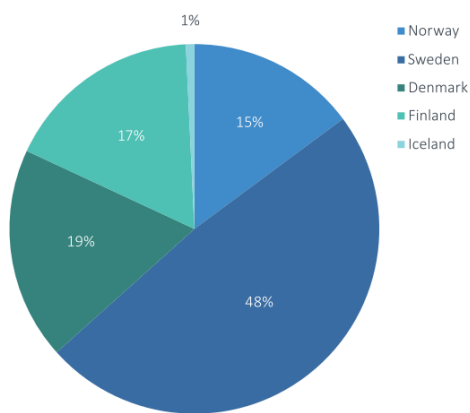


Figure 6 - PE deal volume by country

The figure reports a breakdown of the PE activity by country in the Nordic region. Data are reported in percentage over the total number of deals and are updated to 2019.



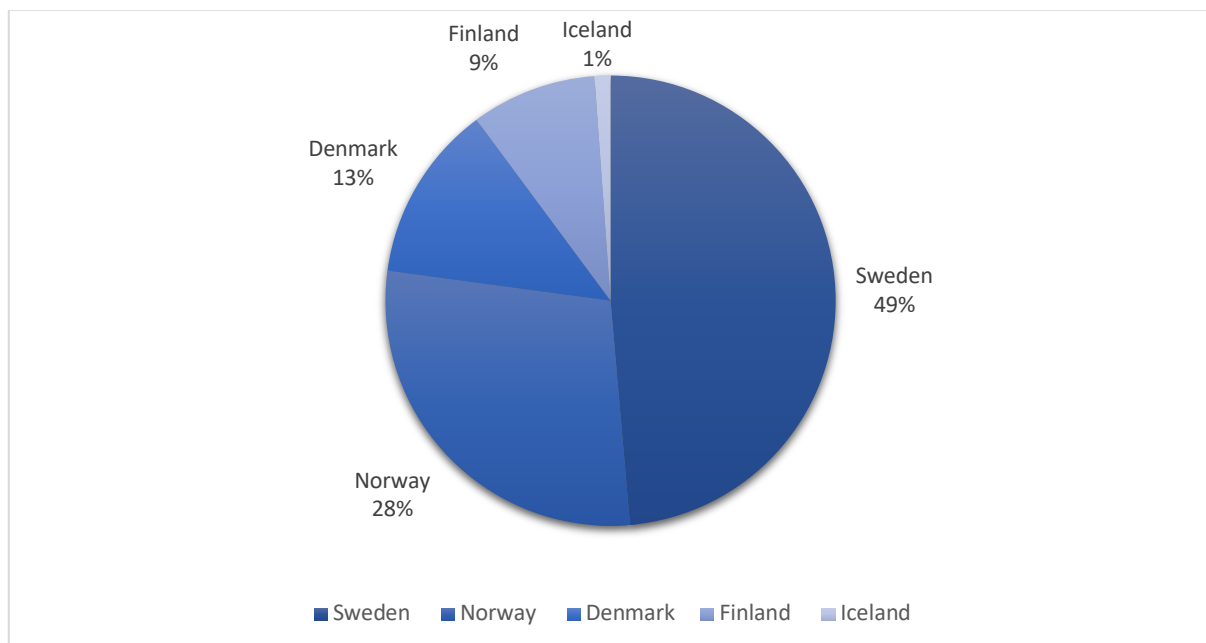
Source: PitchBook | Geography: Nordics

Sweden acts as the major player among the Nordic countries in terms of geography, registering a constant growth in both volumes and values. Moreover, Sweden companies are the most active buyers, followed by international ones, especially the US and UK, for targets based in the Nordics. For instance, in 2020, Sweden accounted for 48% of the total PE market, as showed by the graph. The analysis of Nordic M&As also confirms the leading position

of Sweden deals in the last 15 years, where 723 deals out of 1487 considered (48.6%) had as a target a Swedish company.

Figure 7 - Nordic M&A by country

The figure reports a breakdown of the M&A activity by country in the Nordic region. Data are reported in percentage over the total number of deals and are updated to 2021. Data are computed on a sample of 1487 transactions.



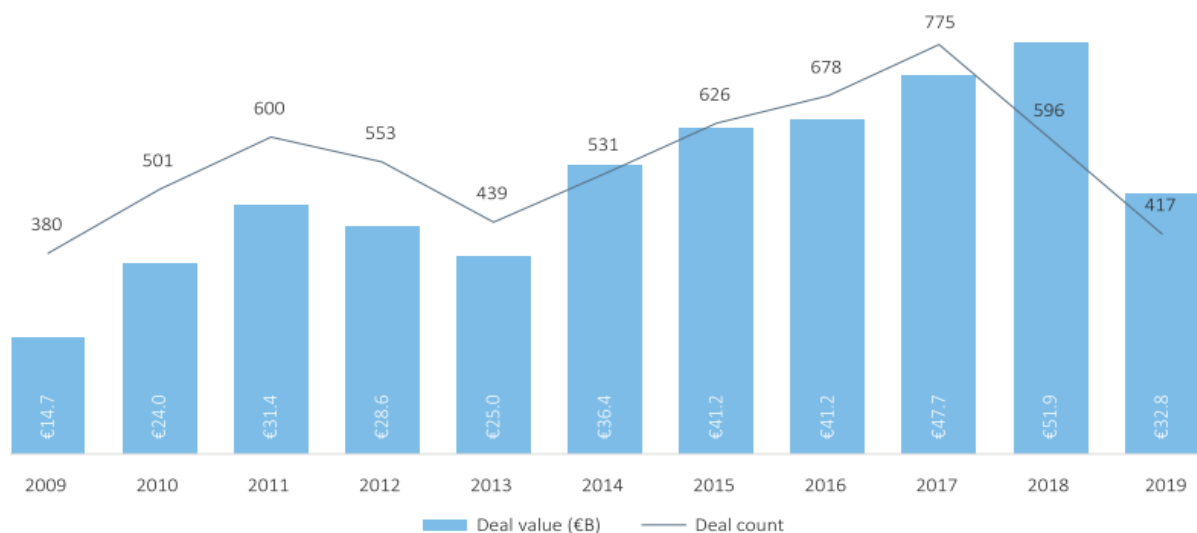
As reported in the Pitchbook report, *M&A activity in the Nordic region is disproportionately skewed towards domestic activity, four of which accounted for 41.3% of deal volume in 2019, with Sweden attributing the bulk of that share.*

Several reasons explain this trend. First, local buyers perceive the transaction as less risky, partially because the due diligence activity can be concluded faster and more efficiently, partially because they better know the market and its players. Moreover, a significant share of bidders also states that a domestic deal has higher chances of getting regulatory approval and exploiting growth synergies.

However, 2019 has been the first time in six years when domestic deals decreased, leaving the floor to external ones. Experts argue that the domestic peak is probably reached, and bidders are now more looking to the external market, especially in quickly expanding economies. It lets us predict that future growth expectations are present for the Nordic market, especially outside its region.

Figure 8 - Domestic M&A activity

The figure reports for the period 2009 – 2019 the deal value and the deal count of domestic M&A transactions concluded in the Nordic market. Domestic transactions are those deals with both the buyers and the sellers belonging to the same country.

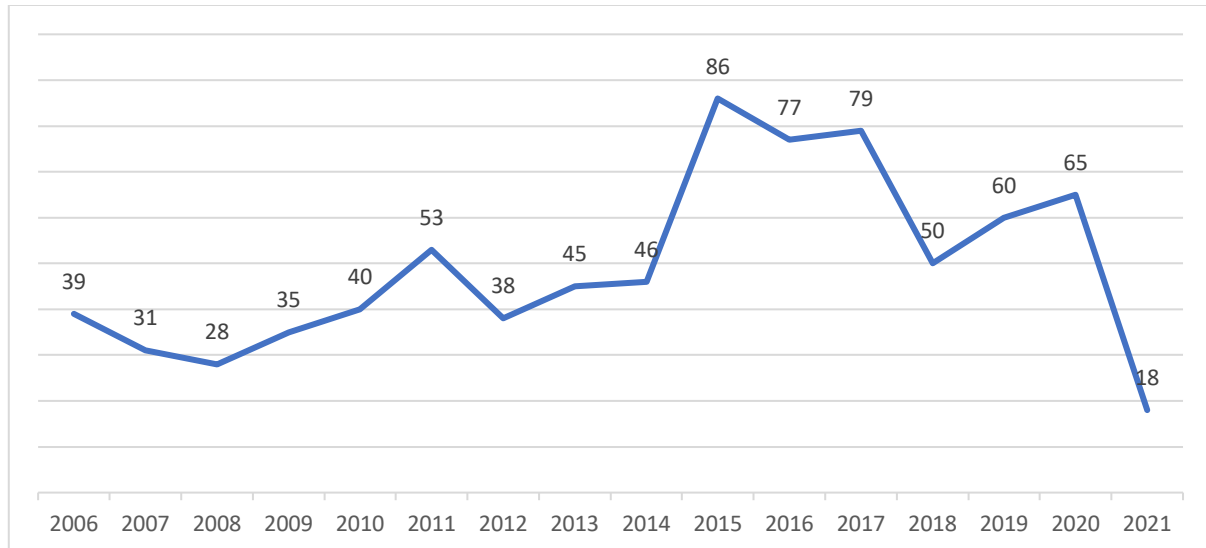


Source: PitchBook | Geography: Nordics

Regarding the sample discussed in chapter 4.1, the situation is instead slightly different. If we consider as domestic transaction those with both the bidder and the target headquartered in the Nordics, we obtain the following data (the total sample is reduced from 1487 to 790 transactions):

Figure 9 - Deal Count (Domestic M&A)

Figure 11 reports the number of domestic activities concluded in the Nordics during the period 2006 – 2021. The sample is composed of 790 transactions.



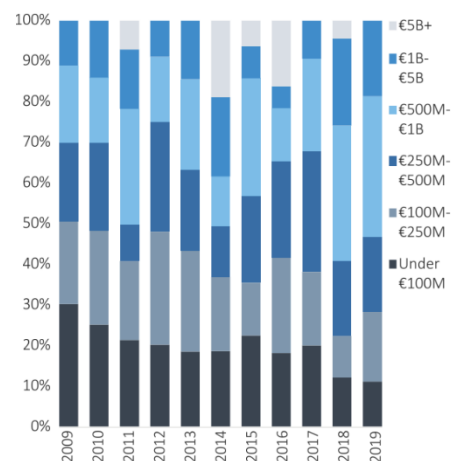
The representation is less relevant in terms of deal value as we miss many data regarding the total deal value of several transactions. Therefore, any comparison would be misleading.

The last relevant trend regards the size of the deals. In 2019 almost 73% of the deals had a value lower than 100 million euros.

Figure 10 - M&A (€) by size

Nevertheless, over 1/3 of the total deals' value for the second year in the row came for transactions valued between 500 million and 1 billion euros. It suggests that the region is moving towards a larger transaction environment, especially in the two countries that account for the majority of Nordic M&A deal activity: Sweden and Finland.

The same trend is also evident from the analysis of the last 15 years' transactions according to a sample of 1487 operations. Information on the



Source: PitchBook | Geography: Nordics

total value transacted is available only for only 547 deals. Out of these, 75.5% had a value lower than 100 million dollars. The other statistics are reported in the following table:

Table 2 - Number of Deals by Transaction Ranges

The table provides a summary of the deal breakdown by transaction value. It is based on a sample of 547 deals. The table reports the number of deals for each value range and the size of that range relative to the whole sample.

	Deal Number	Size
<i>Greater than \$1 billion</i>	25	4.57%
<i>\$500 - \$999.9mm</i>	26	4.75%
<i>\$100 - \$499.9mm</i>	83	15.17%
<i>Less than \$100mm</i>	413	75.50%

In conclusion, similarly to other countries worldwide, nowadays, the M&A market in the Nordics is experiencing some difficulties related to the spread of the pandemic. Some of the sector's experts report troubles, especially regarding the funding gathering – due to an increase in the interest rates – and the due diligence procedure, which is more difficult to be conducted online.

Additionally, Nordics have experienced a drop on both the seller and the buyer sides. The formers are worried about the low valuations due to the period, while the latter wonder how much they can rely on future forecasts. However, despite the pandemic's harmful effects, according to our sample, in 2020, 105 deals have been concluded against the 101 of 2019. Moreover, at the end of March 2021, already 32 deals – belonging to our screening – have been announced.

The outlook on the M&A markets in this region is positive, reporting that the sector will continue to grow, driven by development in legislation, technologies, and access to new external markets.

3. Scope of work

Considering that, especially for the bidder, the timing can be crucial in a merger or acquisition process, the study aims to find some evidence that conducting these transactions in a specific period may have favored the buyers' profitability.

The study is based on three different tests, each one different from the other. However, the results are strictly related, as are the basis for the following analysis.

First, it observes the behavior of mergers and acquisitions during the distressed periods. The aim is to understand if some characteristic paths are typical of the crises and if they can be furthered studied. To do so, it first investigates if the number of M&As increased during crisis periods. Specifically, it will be investigated the financial crisis (sub-period 2008 – 2010) and the European sovereign debt crisis (sub-period 2011 – 2012). This first analysis will allow us to understand if unexpected shocks in the market had a positive response in terms of M&A deals' count. This result can be valuable also concerning the current critical period. Indeed, in case of a positive response, it will confirm the current experts' opinion that M&As deals will increase in the short run. With the spread of Coronavirus and related economic distress that affected almost every country worldwide, scholars and professionals expressed their belief regarding the consequences of these events in this market. The general sentiment is that M&A will increase as a consequence of companies' savings during lockdowns and the need for restructuring.

The analysis of the volumes during distressed periods will follow this test. Indeed, it is critical to observe if more deals are announced – and eventually concluded – and their magnitude. The combination of these two results is crucial in determining the buyers' behavior. For example, if both the number and values of deals increase during the crises, it may imply that most of the market players increased their activities. On the contrary, a reduction of both the parameters would imply a slow-down of the merger activity. Finally, this intermediary result may let us better individuate the bidders' behavior and willingness to invest during distressing situations.

Once completed this test, a second analysis will be carried out to answer the question: *did M&As concluded during the crisis period registered a positive return for the buyer?*

First we collect all the stock prices at different dates for all the buyers who announced a merger or an acquisition during one of the two crises analyzed. We then compute the return of these stocks, and we finally compare this return with a benchmark to observe if it overperformed the expected price. The aim is to understand if the bidders performed differently from what is generally expected: a significative negative performance. As observed in the literature review, the methods used for the performance assessment are relevant in computing the actual profitability of a transaction. Therefore, the *actual* share price of the company – on the day of the announcement – is compared with the *expected* one based on a valuation theory (CAPM).

Finally, if the previous test leads to some positive conclusions, the analysis will be concluded by investigating the determinants of this *better* performance. It is conducted through a regression study using the absolute, the abnormal, and the cumulative abnormal returns as dependent variables. One predictor will be the market return in the corresponding period as expression of the market phase (expansive or recessive). It will let us understand if the bidders' performance is related to the market behavior or can be explained by other elements. Alongside this, other market and accounting variables will be used to see how they impact the returns.

4. Empirical Studies

This paragraph will discuss the procedure and the results obtained by the three tests that we will conduct. The following table summarizes the empirical approach used:

Table 3 - Empirical study outlook

The table summarizes the main steps covered in each study. There will be three different studies which aim to achieve different conclusions. Each test is divided into two parts; these parts together give a complete overview of the phenomena studied.

	<i>Part A</i>	<i>Part B</i>
<i>Test 1: Analysis of M&A trends</i>	Analysis of the number of M&As concluded in the Nordic Market during the last 15 years.	Analysis of the total deals' value concluded in the Nordic market during the last 15 years.
<i>Test 2: Analysis of bidders' profitability during crisis</i>	Analysis of bidders' absolute return measured in terms of stock price variation since the announcement. The bidders' returns are computed at different periods.	Analysis of the bidders' Abnormal Returns (ARs) and Cumulative Abnormal Returns (CARs). The significance of these returns is verified with a statistical test.
<i>Test 3: regression analysis</i>	The dependent variables used in the regression are the bidders' absolute return, ARs, and CARs. The regressors are selected market variables. This analysis is proposed both for the financial and sovereign debt crisis	The dependent variables used in the regression are the bidders' absolute return, ARs, and CARs. The regressors are selected accounting variables of each company. This analysis is proposed both for the financial and sovereign debt crisis

4.1 Analysis of M&As trends

The first test conducted regards the number of transactions concluded during the financial and the sovereign debt crises and their corresponding values.

Two samples are considered, including all the transactions concluded in the Nordic market (Sweden, Norway, Finland, Denmark, and Iceland) from April 1st, 2006 to April 1st, 2021, using the S&P – Capital IQ database. The first example excludes transactions where the target was a financial institution. The second excludes transactions with targets belonging to the Real estate, Utilities, and financials industries, as they can be considered regulated assets. The following table summarizes the criteria used in the sample creation:

Table 4 - Screening Criteria

The following table contains all the criteria used to create the sample of M&A transactions concluded in the Nordic market during the last 15 years.

Criteria	
1) <i>Geographic Locations (Target/Issuer):</i>	Sweden OR Denmark OR Finland OR Iceland OR Norway
2) <i>Company Type (Target/Issuer):</i>	Public Company
3) <i>Transaction Types:</i>	Merger/Acquisition
4) <i>M&A Announced Date (Including Bids and Letters of Intent):</i>	[4/1/2006-3/31/2021]
5) <i>Industry Classifications (Target/Issuer)²:</i>	Energy OR Materials OR Industrials OR Consumer Discretionary OR Consumer Staples OR Health Care OR Information Technology OR Communication Services

In total, the samples are composed of 1487 and 1355 transactions, respectively, and out of them, only 28 (24 in the second – smaller – sample) transactions have been announced but not concluded. Regarding the number of transactions by sector and the

² The only difference among the two samples regards the last parameter, which, for the first case, includes also RE and utilities.

corresponding relative size over the total number of deals, we can observe the following data:

Table 5 - M&A transactions by sector, last 15 years

The table provides the number of transactions in each sector considered for the two samples created. The first sample excludes M&A deals with a financial target. The second sample excludes deals with targets belonging to the Financial, RE, and Utilities industries. The relative industry size equals the ratio between the transactions number in that industry over the total deals in all the industries (counting those excluded by the sample).

<u>Sector</u>	<u>Sample 1</u>	<u>Sample 2</u>	<u>Relative size</u>
<i>Energy</i>	113	113	6.98%
<i>Real Estate</i>	117	0	7.22%
<i>Materials</i>	102	102	6.30%
<i>Industrials</i>	390	390	24.07%
<i>Consumer Discretionary</i>	151	151	9.32%
<i>Consumer Staples</i>	86	86	5.31%
<i>Health Care</i>	180	180	11.11%
<i>Financials</i>	0	0	-
<i>Information Technology</i>	232	232	14.32%
<i>Communication Services</i>	101	101	6.23%
<i>Utilities</i>	15	0	0.93%

Specifically, the relative size is computed as the ratio between the number of deals in each industry and the overall number of deals, including those belonging to those sectors not considered in the sample. In this way, the relative parameter *size* represents the size of the industry relative to the whole market and not to the single sample.

According to the Nordic market analysis previously conducted, the leading industries are IT, Health Care, and Industrial. Moreover, the Real Estate segment of the market also accounts for a high share, justifying almost the whole difference among the two samples. Financial institutions – which have never been considered - instead concluded 133 transactions over the 15 years, representing 8% of the overall market.

We also provide information about the most active buyers in terms of transactions and the value of the deals. The following information is provided only concerning the first sample as the differences are negligible for the scope of this analysis.

Table 6 - 10 most active buyers by deal number, last 15 years

The table provides a list of the ten most active buyers by the number of transactions in the last 15 years. The size of each buyer is computed over the total number of transactions concluded in the period considered.

Company Name	Number of Transactions	Size
Nordea Funds AB	17	1.14%
Geveran Trading Co., Ltd.	11	0.74%
AP Fonden 4	9	0.61%
Lannebo Fonder AB	8	0.54%
Samhällsbyggnadsbolaget i Norden AB	8	0.54%
Swedbank Robur Fonder AB	8	0.54%
AB Traction	7	0.47%
Creades AB	7	0.47%
EQT Partners AB	7	0.47%
Investment AB Latour	7	0.47%

The corresponding percentage is calculated relative to the total number of transactions (1487). These data represent the reference market, which is sufficient – but not highly – fragmented in companies' leaders (by transactions' number). Indeed, the ten most active companies concluded a total of 89 transactions representing only 6% of the total sample.

However, the situation is significantly different regarding the total transactions' values. As reported in the following table, there is one company which has concluded a significant big transaction.

Table 7 - 10 most active buyers by deal value, last 15 years

The table provides a list of the ten most active buyers by transaction's value in the last 15 years. The size is computed as the ratio between the bidders' total transaction value over the total value transacted (based on the available data).

Company Name	Total Transaction (\$mm)	Size
Orange SA.	95,235.81	42.89%
Samhällsbyggnadsbolaget i Norden AB	14,671.31	6.61%
G4S plc	9,273.81	4.18%
Cargotec Corporation	8,180.18	3.68%
The Weir Group PLC	7,462.41	3.36%

<i>Castellum AB</i>	6,522.78	2.94%
<i>EQT Partners AB</i>	6,015.97	2.71%
<i>Tele2 AB</i>	4,497.35	2.03%
<i>Ahlström Capital Oy</i>	3,824.89	1.72%
<i>Bain Capital Private Equity (Europe), LLP</i>	3,782.63	1.70%
<i>Total</i>	159,467.13	71.82%

Orange SA started in 2008 the acquisition of Telia - another telecommunication company – for a total value of more than \$61 billion. This transaction accounts for more than 27% of the overall value explaining the high percentage (42.89%) of deal value concluded by Orange. Moreover, it is clear – and not surprising – that few companies account for a high percentage of total deals. In this case, the top ten companies concluded 71% of the overall value created in the last 15 years. It happens as the majority of the transactions concluded had a low deal value, while only a few of them can be considered megadeals and recorded a significantly high value. For instance, if considered as low-level transactions those deals which have a transaction value lower than 100 million dollars, we can observe:

Table 8 - Number of deals with a value greater than \$100 million

This table provides information on the total number of deals with a known value for both crises. Out of these is computed the number of transactions with a value greater than 100 million dollars. The size is computed over the number of deals with disclosed value.

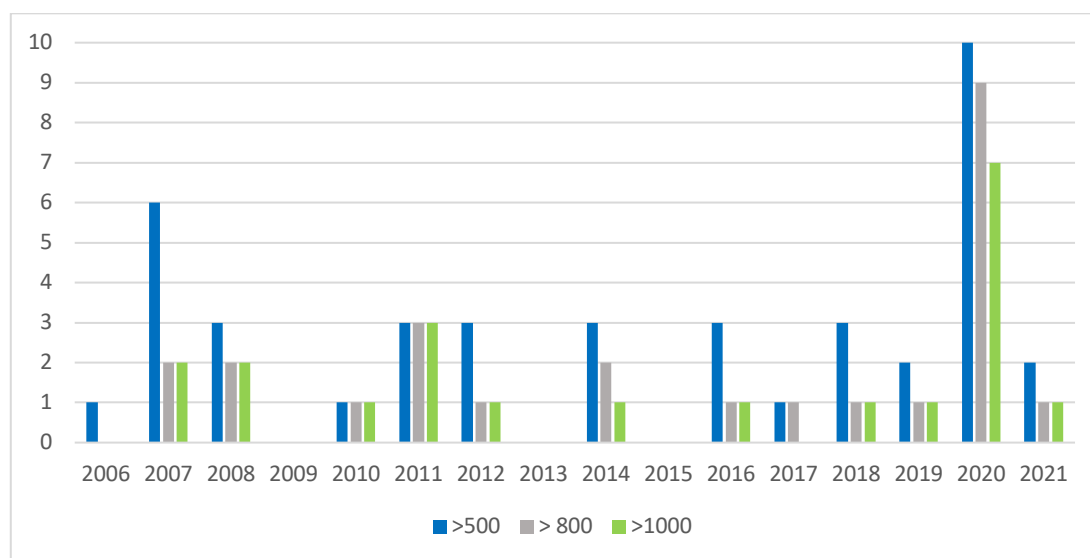
<i>Reference crisis</i>	<i>Deals (#) with reported value</i>	<i>Deals (#) with value > \$ 100 million</i>	<i>Relative size</i>
<i>Financial crises (2008 – 2010)</i>	48	42	87.5%
<i>Sovereign debt crisis (2011-2012)</i>	28	25	89.3%

As the primary buyers in terms of the number of transactions are not equal to those by deal value, this let us conclude that many buyers in the Nordic market conclude many low values transactions, and some big companies pursue few big deals. This result is in line with the expected quite fragmented market where many players conclude low-value transactions. The sample considers three crises: the financial, the sovereign debt, and the pandemic ones. Hence, high-value deals may be concentrated in distressed periods due to better economic conditions and lower valuations. Indeed, as

proved by the following graph, the highest deals have been announced during these three crises.

Figure 11 - Big deals by transaction value

The figure reports the number of transactions with a deal value higher than 500, 800, and 1000 million dollars. The sample comprises the period 2006 – 2021.



The relevance of this trend will be specifically analyzed thereafter. To support these findings, we provide two more tables:

Table 9 - Valuation Summary

This table provides a series of aggregates and commonly used M&A multiples together with their value based on sample 1.

Total Deal Value(\$mm):	222,024.4
Average Deal Value:	405.9
Average TEV/Revenue:	6.16
Average TEV/EBITDA:	16.16
Average Day Prior Premium(%):	2.37
Average Week Prior Premium(%):	2.73
Average Month Prior Premium(%):	4.25

Table 10 - Number of Deals by Transaction Ranges

This table provides a breakout of the transactions number by deal value based on sample 1.

Greater than \$1 billion	25
\$500 - \$999.9mm	26

<i>\$100 - \$499.9mm</i>	83
<i>Less than \$100mm</i>	413
<i>Undisclosed statistics</i>	940

The first critical information regards the average transaction value, which is around 400 million dollars, much lower than the 61 billion of the biggest one. According to these, few deals – only 51 out of those disclosed – registered a value higher than half a billion dollars. However, it is essential to underline that some financial and market figures (especially regarding the TEV multiples and stock prices premia) are not provided by many companies. Therefore, the actual result may be slightly different from those provided, but this information is still reliable enough to provide a sufficiently clear picture of the overall market.

4.1.1 Analysis of the number of M&As concluded

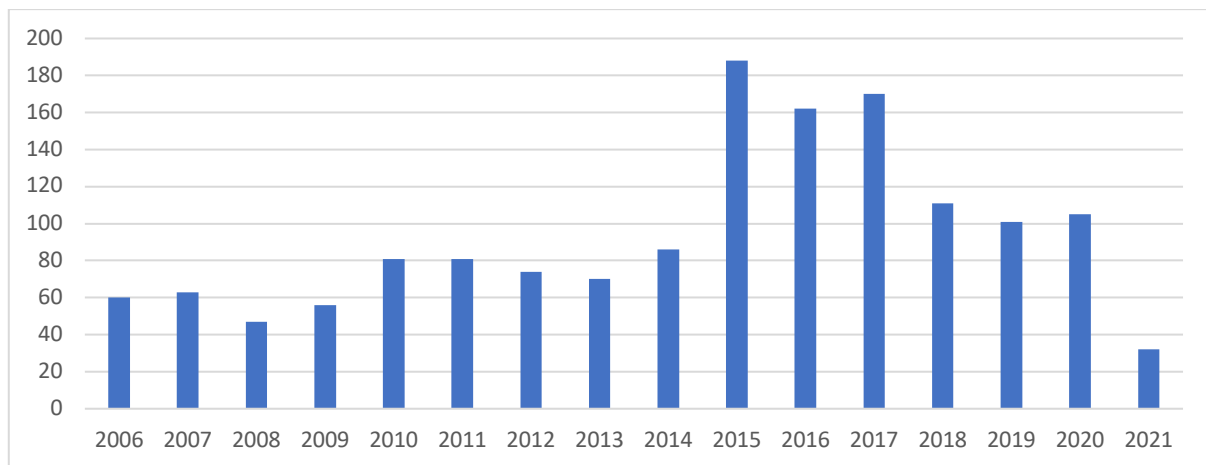
To understand if the number – and or the deal's value – increased, we first test these assumptions on the larger sample, which excludes only the financial institutions during the financial and the sovereign debt crisis. The same research is then extended to the smaller sample.

Concerning the first sample, immediately after the financial crisis, the number of transactions decreased, probably due to the considerable market shock and the high level of uncertainty. However, it increased in the following years, proving that companies in the Nordic reacted to this crisis, increasing mergers.

The trend continued until 2011, when the sovereign debt crisis hit mainly the Eurozone. However, the Nordic M&A market did not react quickly to this shock as the number of mergers and acquisitions continued to decrease until 2014.

Figure 12 - Nordic M&As deals (Sample 1)

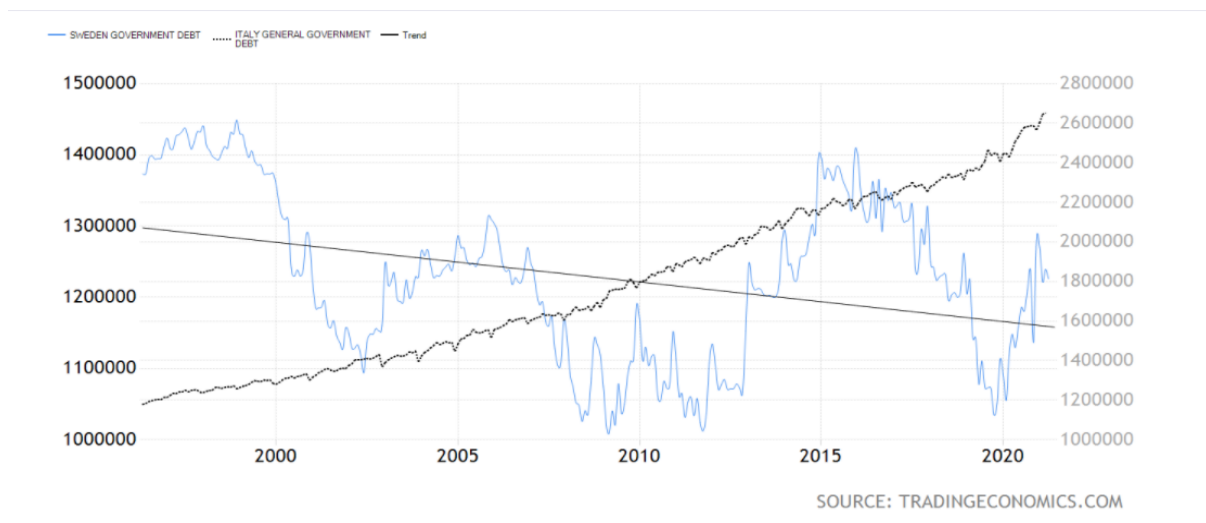
The figure reports the number of M&A deals announced in the Nordic market between 2006 – 2021. Data are based on *Sample 1*, which comprises all the transactions with public targets belonging to any sector except the Financial industry.



It can be – probably – partially explained by the lower magnitude of this crisis in the Nordic market than in other European countries. Therefore, Nordic companies did not benefit from possible more favorable conditions. The following graph compares the government debt level in the last 25 years between Sweden and Italy. Sweden, as observed, is the most active country in the Nordics, and Italy has been one of the most hit countries during the sovereign debt crisis. The trend line indicates the decreasing trend of the Sweden sovereign debt.

Figure 13 - Sweden and Italy Government Debt level

The figure reports the level of Sweden (blue line) and Italy (black dotted line) government debt in 2000 – 2020. The straight black line represents the decreasing Sweden trend.

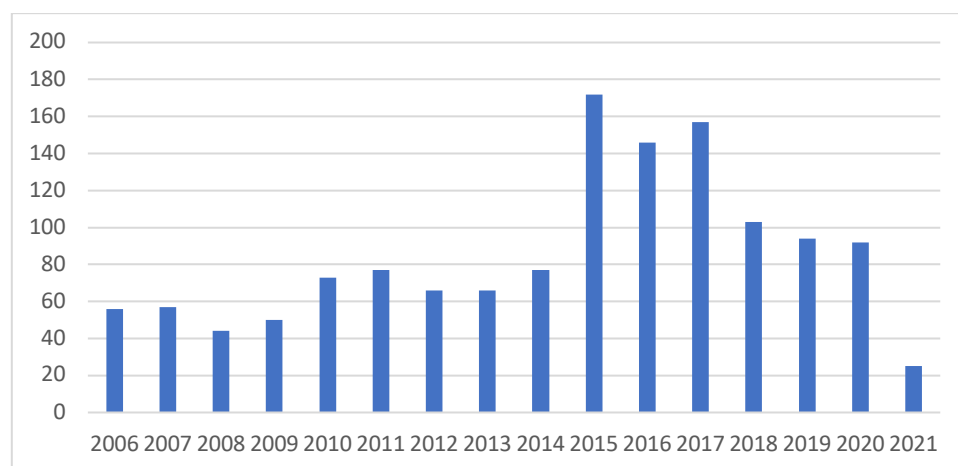


The chart clearly shows the opposite paths between the two countries, which confirms the lower impact of the sovereign crisis in the Nordics.

Similar results can also be observed in the second sample, which excludes transactions where the target belongs to the Real estate, Utilities, and Financial industry. The following graph represents the exact information of the above and confirms the similarity of results:

Figure 14 - Nordic M&As deals (Sample 2)

The figure reports the number of M&A deals announced in the Nordic market between 2006 – 2021. Data are based on *Sample 2*, which comprises all the transactions with public targets belonging to any sector except the Financial, Real Estate, and Utility industries.



In conclusion, on average, the number of deals decreases at the beginning of a crisis, but the Nordic M&As market seems to react quickly to this slackening. This path is more evident in the financial and the pandemic crises, while it is weaker in 2011-2012 because the sovereign debt crisis has penalized less this region. Indeed, according to the following table, ERPs variation during these years was lower than in other European countries. As ERPs should reflect the country's riskiness, they are expected to grow in a period of sovereign debt distress (as it happened for other southern European countries). Indeed, it is possible to observe that between 2011 – 2012, the ERPs of the Nordics were much smaller than other European countries which were much affected by the crisis. The only exception regards Iceland, but the country is negligible as it accounts for only 1% of this study (see figure 9).

Table 11 - Countries' ERPs

This table reports the Equity Risk Premiums of the Nordic countries, Italy, Spain, and Greece, during the two crises studied. Data are collected from the Damodaran database.

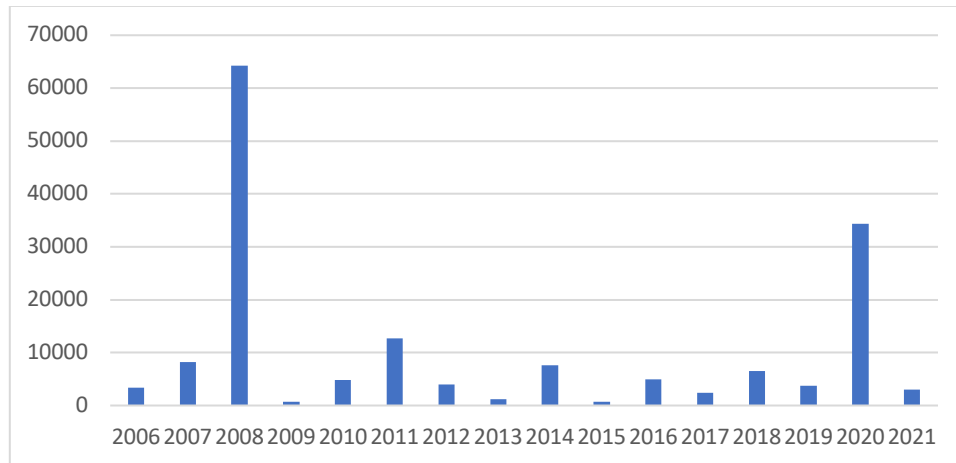
	2007	2008	2009	2010	2011	2012
<i>Denmark</i>	4.79%	5%	4.50%	5%	6%	5.80%
<i>Finland</i>	4.79%	5%	4.50%	5%	6%	5.80%
<i>Iceland</i>	4.79%	8%	7.50%	8%	9%	8.80%
<i>Norway</i>	4.79%	5%	4.50%	5%	6%	5.80%
<i>Sweden</i>	4.79%	5%	4.50%	5%	6%	5.80%
<i>Italy</i>	5.54%	6.50%	5.40%	5.75%	7.5%	8.43%
<i>Spain</i>	4.79%	5%	4.50%	5.38%	7.28%	8.80%
<i>Greece</i>	5.84%	7.10%	6.08%	8.60%	16.50%	20.80%

4.1.2. Analysis of M&As values

If we instead analyze the transactions' values, the results are pretty in line with the previous conclusion regarding the 2008-2010 crisis but slightly differ concerning the second. Specifically, we can observe a peak in 2008 values, which is highly explained by the transaction mentioned above between Orange SA and Telia. Another peak was observable in 2020, together with much smaller values in 2011. Again, the lower deals' amount in 2011 is probably due to the lower impact the crises had in the region. The following graph reports the M&As overall values in the last 15 years:

Figure 15 - Nordic M&As value (Sample 1)

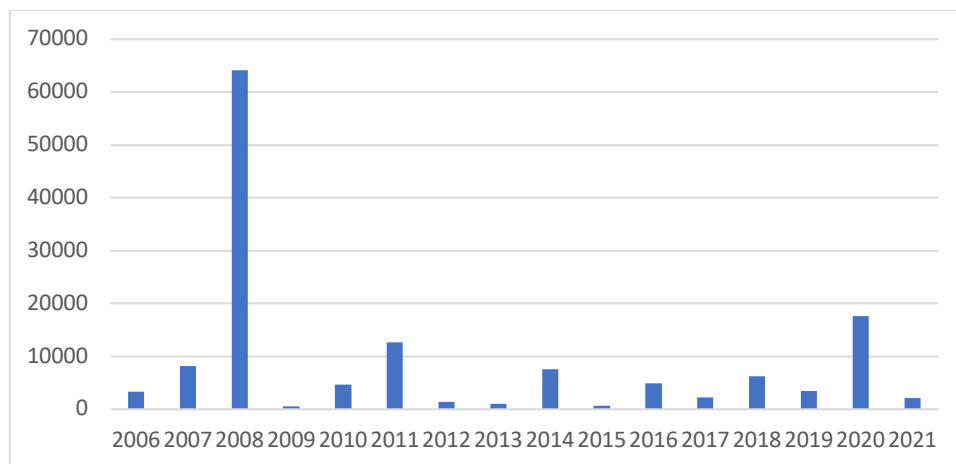
The figure reports the deal value of M&A transactions announced in the Nordic market between 2006 – 2021. Data are based on *Sample 1*, which comprises all the transactions with public targets belonging to any sector except the Financial industry.



We then compare these amounts with those registered from the – smaller – second sample, and we observe that the only relevant difference regarded the overall transactions' value in 2020. It is significantly lower in the second sample, decreasing from € 34301 million to € 17666 million, respectively. It is explained by the fact that in the second sample, we did not include the Real Estate industry, which registered a high performance in terms of deals' value. However, as this is the only significant difference and is not relevant for the scope of this research, which is focused on the period between 2008 and 2012, we decided to consider only the first sample.

Figure 16 - Nordic M&As value (Sample 2)

The figure reports the deal value of M&A transactions announced in the Nordic market between 2006 – 2021. Data are based on *Sample 2*, which comprises all the transactions with public targets belonging to any sector except the Financial, Real Estate, and Utility industries.



In conclusion, in the Nordics, M&As' values increase during crisis periods. Moreover, the more significant the impact of the crises, the higher the increment in value terms.

Therefore, we identified a relevant trend in the Nordics: M&As deals decrease during crises, but those who still invest are willing to inject more money into the market. However, according to the following analysis, during the periods close to the crises, the EV/EBITDA, and the P/E multiples (two of the most commonly used multiples in M&A valuations) are not statistically different from the same multiples in non-crisis periods. Hence it is not possible to confirm that the increment of value transacted is linked to lower valuations.

The multiples used to create the chart represent the average and the median EV/EBITDA - P/E multiples in the Nordics, based on the same sample of transactions used in the analysis conducted at point 4.1. However, the multiples are not available for many sample transactions, meaning that the statistics may be slightly different if more data were provided. To check the statistical significance has been conducted a test on the average difference. The null hypothesis is $\mu_x = \mu_y$ where μ_x is the average of bidders' multiples in non-crisis periods and μ_y is the average of bidders' multiples in crisis periods. Crisis periods are considered those starting from September 2007 until September 2010 and January 2011 to December 2012. The sample includes transactions from 2006 until 2016. Thus, the remaining periods are considered as non-crisis ones.

The null hypothesis is rejected if the p-value of the test statistic is lower than the selected confidence level. The statistical test for difference between population means is computed according to the following formula: $\overline{\mu}_x - \overline{\mu}_y / \sqrt{\frac{s_x^2}{n_x} + \frac{s_y^2}{n_y}}$. The test is repeated for both the EV/EBITDA and the P/E multiples, but in both cases, it is not possible to reject the null hypothesis that the averages of the two multiples are equal. Indeed, the p-value is always higher than 5% or 10% confidence levels.

Figure 17 - 10 years EV/EBITDA and PE multiples

The chart reports the evolution of M&A deals' multiples during the period 2006 – 2016. For both the EV/EBITDA and the PE multiples, the average and median are computed each year.

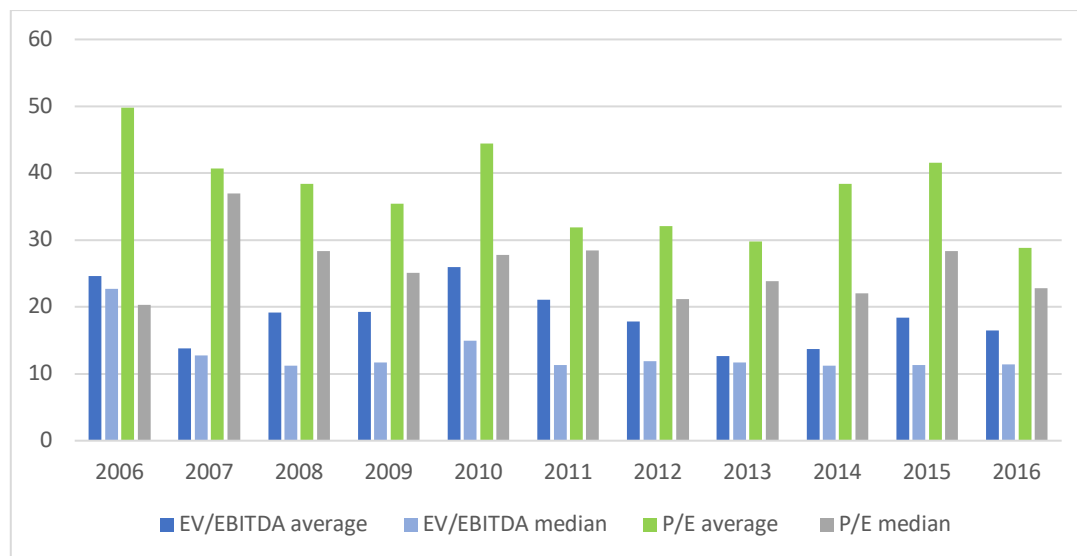


Table 1 - Statistical test results on EV/EBITDA and P/E multiples, period 2006 – 2016

The table provides information on the test statistic computed on the difference of multiple averages. The two multiples considered are the EV/EBITDA and the PE during the period 2006 – 2016. The two tests aim to verify if the average multiple in a period of market crisis is statistically different from the average in normal market behavior. As market crises are considered the financial and the sovereign debt ones. The table also reports the values of the test statistics and the related p-values computed using a normal distribution. Moreover, the mean, the variance, and the number of observations of each sample used in the analysis are provided.

	EV/EBITDA		P/E	
<i>Test stat.</i>	0.6465		-0.2490	
<i>P-value</i>	25.90%		59.83%	
	<u>Non-crisis sample</u>	<u>Crisis sample</u>	<u>Non-crisis sample</u>	<u>Crisis sample</u>
<i>Mean (μ)</i>	17.65	19.80	37.05	36.25
<i>Sample variance</i>	278.67	656.60	1319.88	1156.90
<i>N</i>	151	71	343	175

4.2 Analysis of Bidders' profitability during crises

This paragraph will conduct the second test, focusing on studying the buyers' performances during the financial (2008-2010) and sovereign debt crises (2011-2012).

The first step is to redefine the sample, selecting – from the previous one - all the M&As transactions concluded during these crises in the Nordic market. Specifically, it is required that both the bidders and the targets were based in the Nordics, and both of

them were public companies. The last requirement aims to facilitate the data collection process. Finally all the industries except the financial one have been selected, obtaining a sample of 128 mergers and acquisitions spread among the different industries according to this table:

Table 2 - M&A transactions by sector, financial and sovereign debt crises

The table lists the number of M&A transactions concluded in each sector during 2008 – 2012 in the Nordic market. The size of each industry is computed relative to the whole number of M&A transactions present in the sample.

<u>Sector</u>	<u>Num. of Transactions</u>	
<i>Energy</i>	9	7.03%
<i>Real Estate</i>	43	33.59%
<i>Materials</i>	11	8.59%
<i>Industrials</i>	24	18.75%
<i>Consumer Discretionary</i>	4	3.13%
<i>Consumer Staples</i>	8	6.25%
<i>Health Care</i>	4	3.13%
<i>Financials</i>	0	0.00%
<i>Information Technology</i>	15	11.72%
<i>Communication Services</i>	7	5.47%
<i>Utilities</i>	3	2.34%

The leading industries are the same as the broader sample considered in the previous test. However, it appears clear that in this timeframe, the Real Estate industry played a relevant role. One factor that should be considered is the subprime debt crisis and the related collapse of the real estate market. It probably forced many players in this sector to conclude a merger due to the crisis or incentivized them to exploit this opportunity to pursue a growth strategy.

Moreover, if we analyze the first ten deals by value, we can observe that they account for 87% of the overall transaction value during 2008 - 2012. It confirms the idea that companies tend to focus on big deals during distressed periods, as those who can afford a deal want to achieve the maximum from it.

Table 3 - 10 most active buyers by deal values, financial and sovereign debt crises

The table provides a list of the ten most active buyers by transaction's value during 2008 – 2012. The size is computed as ratio between the bidders' total transaction value over the total value transacted (based on the available data).

Company Name	Total Transaction Size (\$mm)	Relative size
ASSA ABLOY AB (publ) (OM:ASSA B)	1,724.13	20.79%
Pandox AB (publ) (OM:PNDX B)	1,321.24	15.93%
UPM-Kymmene Oyj (HLSE:UPM)	1,144.55	13.80%
Austevoll Seafood ASA (OB:AUSS)	550.28	6.64%
Havila Shipping ASA (OB:HAVI)	531.32	6.41%
Fonden Realdania	439.2	5.30%
Topdanmark A/S (CPSE:TOP)	439.2	5.30%
PFA Pension, forsikringsaktieselskab	439.2	5.30%
Pensam Liv Forsikringsaktieselskab A/S	439.2	5.30%
EVRY ASA	221.57	2.67%

These results are in line also with the current – post-pandemic – trend. According to a report published by KPMG, the 2021 first quarter outperformed the 2020 first quarter in terms of value (in Italy, for example, the overall value increase from around 10 billion euro to more than €26 billion). Moreover, 94% of total transactions' value is explained by the first ten deals.

Therefore, it can be confirmed that the number of M&As tends to decrease; however, the overall value increases. This result is significant as it describes an evident peculiarity of distressed periods. Moreover, it allows to study the determinants of this trend, as it is reasonable to assume that if bidders are willing to invest more is because they are expecting a better return compared to usual M&As standards.

4.2.1 Analysis of bidders' absolute returns

The first step requires determining the buyers' returns. In this way, we aim to understand if those transactions concluded in these periods achieved better profits for buyers than usual negative performances. It is essential to remind the reader that all the studies conducted until now on the topic report – on average – negative performances for the bidders. Therefore, we want to test if the buyers' profitability in these periods is increased compared to what is traditionally stated. In other words, a negative return for the bidder – but lower than the average of bidders' negative

performances – already represents an improvement in terms of profitability. We do not expect a series of all positive returns – also because we have to remind that we are analyzing stock prices during crisis periods – but we rather expect a portion of positive returns and some partially negative returns.

One more relevant point which is worth underlying is that all these returns are computed as price variation regarding the price before the announcement as we want to observe if the information of the merger impacted the price and in which period.

To test so, we collect from the Eikon-Refinitiv database the buyers' stock prices one day before the announcement, on the announcement day, five days after, one month after, six months after, and one year after. It is essential to mention that the stock prices were not available for the whole 128 companies on all the dates, and therefore the sample is adjusted in each sub-period, excluding those companies for which the price was not available.

After the announcement, we compute the price return for each buyer at different sub-period to observe the stock price evolution. So, for example, we computed the five trading days returns – i.e., one week after the announcement return – as share price variation between the value at the announcement day and the value five trading days after. The same procedure has been retrieved for all the buyers at all the different sub-periods.

The analysis reflects that during the financial crisis - on average - 45% of the companies analyzed registered a positive return – in absolute value – implying that, on average, the buyers' performance has not been negatively affected by the merger. Moreover, if we consider the adverse effects of the crises on the stock prices, these positive returns appear even more relevant. For example, if we test how many bidders had a stock return higher than -1% (which seems acceptable due to the period), the results improved significantly. At the announcement, 70% of the companies' returns were higher than -1% (77% higher than -2% and 85% higher than -3%). These values settle between 50% and 55% in the following sub-periods, diminishing to 38% of the companies one year from the announcement. Instead, during 2011-2012, positive returns increase to 45-55% (depending on when it is measured). 76% of the companies

registered a return higher than -1% on the announcement day and 71% one week later. These numbers increase to 82% (87% higher than -3%) and 73% (82% higher than -3%) respectively when considering returns higher than -2%. Moreover, considering the returns higher than -1% in the following sub-periods between one month and one year after the announcement, these values range between 50% and 60%. These results are summarized in the following table and prove that – on average – half of the companies did not have a negative stock return after the merger. However, this does not necessarily mean that merging during crises creates value for the bidders. In order to conclude so, it will be necessary to test the abnormal returns. This analysis will be conducted in the following chapter.

Table 4 - Bidders' positive absolute returns

The table provides the number of transactions in which the bidders registered a positive absolute return. Data are available for both crises. The size is computed over the total number of deals available in our sample for the reference period.

		<i>Announcement</i>	<i>5d after</i>	<i>1m after</i>	<i>6m after</i>	<i>1y after</i>
2008	<i># transactions with positive return</i>	27	29	27	33	23
-						
2010	<i>Relative size</i>	44%	48%	44%	54%	38%
2011	<i># transactions with positive return</i>	21	26	26	22	22
-						
2012	<i>Relative size</i>	47%	58%	58%	49%	49%

It is clear that – on average – the bidders' returns positively react at the announcement and in the first week after it, for then assessing to lower values in the following months.

4.2.2 Analysis of abnormal returns

However, to see if the merger created a benefit for the buyers, it is necessary to compare these returns with a benchmark. This test is based on an event study methodology, and specifically, we want to test if the event "M&A announcement" impacted the firm's profitability. The test is based on the market rationality assumption, so the event's effects will be immediately incorporated into the stock prices.

The test is based on the same set of data and time intervals discussed in the previous chapter and used to compute the absolute returns. The same stock returns are now

used to compute abnormal returns. These are defined as the actual ex-post returns of the securities over the event window minus the firm's expected return over the event window. The normal return is defined as the expected return without conditioning on the event (S. MacKinlay, 1996). The available literature on the event study suggests two methods to compute abnormal returns: the constant mean return model and the market model. Between the two, the market model represents an improvement over the other as it reduces the variance of abnormal returns by removing the portion of returns related to the market returns (S. MacKinlay, 1996).

As a market model, we selected the CAPM. Under the assumption of the market efficiency, it should reflect the *theoretical* stock's return on that specific day based on all the available information in the market. A positive difference between the actual and CAPM return would imply that the buyer has overperformed the *theoretical* expected price. Indeed, if the return of the buyers is higher than the one predicted by the CAPM in the period following the merger, it is reasonable to assume that the M&A transaction had a positive impact on the company's profitability. On the contrary, even if the bidder registered a positive absolute return in the period following the merger, but it is lower than the CAPM, it may be affirmed that the firm could have achieved better profitability without the M&A. In other words, the merger could be considered the reason behind the negative difference between the actual and the theoretical return. For this reason, it is suggestable to compare the real return with a benchmark to prove the positive impact that the M&A had on the bidders' profitability.

However, some studies argue that the restrictions imposed on the market model by the assumptions implicit in the CAPM imply that the study results may be sensitive to them. Therefore, a proposed solution has been to use the APT model instead of CAPM, which predicts returns based on a multifactorial model and considers other parameters together with the market factor. However, as the most crucial factor in the APT model behaves as the market factor and the other factors add little explanatory power, the gains from using APT versus the market model are sensibly small (S. MacKinlay, 1996 and S. Brown, M. Weinstein (1985)). For this reason, this paper uses the market model approach, where the parameters are estimated using the CAPM under ordinary least squares (OLS) assumptions.

The market model approach requires to estimate the expected (unconditional) return based on the following formula:

$$R_{it} = \alpha + \beta_i R_{mt} + \varepsilon_{it}$$

With: $E(\varepsilon_{it}) = 0$ and $Var(\varepsilon_{it}) = \sigma_\varepsilon^2$ where the ε_{it} are iid normally distributed r.v.

The CAPM assumes the coefficient α to be equal to the risk-free rate, and the return of the market factor is created as the excess return of the market over the risk-free rate, called Equity Risk Premia. Moreover, the β of each security represents the stock correlation with the market returns, according to the following formula:

$$\beta = \frac{Cov(R_{it}, R_{mt})}{Var(R_{mt})}$$

The companies' betas and the Equity Risk Premia specific for each country at the announcement year have been used to compute the CAPM parameters. These data – together with the stock prices – have been collected using the Refinitiv Eikon database. Moreover, to compute the CAPM return at different sub-periods (announcement day, five days, 1 – 6, and 12 months later), it is used the 10-year risk-free rate published by ECB on each corresponding day. The decision to use the 10-year risk-free rate lies in assuming that the current stock price should reflect the expected discounted cash flows over the future. Finally, the abnormal returns are computed as the difference between the absolute and the expected returns:

$$AR_{it} = R_{it} - E(r_{it} | X_t)$$

Where X_t is the conditioning information for the normal return model (CAPM in this study). Therefore, the abnormal return formula is: $AR_{it} = R_{it} - rf_t - \hat{\beta}_{it} ERP_t$

Studying the abnormal returns, we observe that around 45% and 50% of the two samples respectively outperformed the return predicted by CAPM. It implies that, on average, those companies who had a positive return in the year after the announcement had a return sufficiently higher to beat the Capital Asset Pricing Model predictions, as showed by the following table:

Table 5 - bidders' positive ARs, financial crisis

This table provides the number of positive abnormal returns registered by the bidders in the sample during the financial crisis. The abnormal returns are computed as the difference between the bidders' absolute returns and the market model (CAPM). The size is computed as the ratio between the positive ARs and the total ARs observed in the sample.

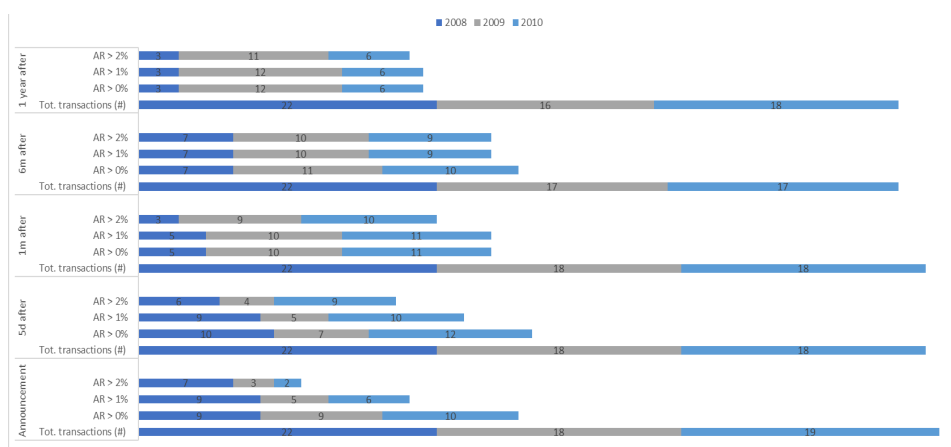
2008-2010	Announcement	5d after	1m after	6m after	1y after
# transactions with positive AR	28	29	26	28	21
Relative size	46%	48%	43%	46%	34%

However, these higher returns do not necessarily positively impact bidders as it is necessary to study their statistical significance.

Concerning the different sub-periods examined, no significant difference has been noticed among them. Both in terms of absolute and abnormal returns, the positive performances represent around 50% of the samples. However, it is important to underline that if a company had an absolute positive return one week after the announcement, it – on average – remained positive also in the following sub-periods. Instead, if a company had a return higher than the one predicted by CAPM in the first week after the announcement, it is not likely to stay the same for all the following periods. It is evident in the following chart:

Figure 18 - Financial crisis abnormal returns, deal count

The figure reports the total number of transactions considered in the sample for each subperiod. Out of them is presented the number of those transactions with Abnormal Return higher than 0%, 1%, and 2%. Data are available for the financial crisis only and are divided into five subperiods: M&A announcement, five days, one month, six months, and one year after the announcement.



This chart shows the total number of deals for every period considered (announcement day, one week, one month, six months, and one year after it), for which we have price information. Moreover, the graph shows the percentage of deals with positive, higher than 1%, and higher than 2% absolute returns.

First, it is confirmed what showed in the previous table: on average, 50% of abnormal returns computed in each sub-period are positive, but the number decreases approaching the 1-year returns. Moreover, in the short time horizon (ARs at the announcement and one week after it), the number of ARs higher than 1% or 2% is lower than those higher than zero. On the contrary, on a longer time horizon, these numbers tend to coincide. Moreover, those transactions with AR higher than 1% - 2% in the medium and long run are not always those which outperformed CAPM in the short run. It means that – *in terms of absolute returns* – some buyers outperformed the CAPM immediately at the announcement, but then their stock prices returned to a “normal” value after that. In other words, they immediately incorporated the positive shock at the announcement. Instead, other companies had a return similar to the one predicted by CAPM – or lower than it - at the announcement, and then it increased, outperforming the benchmark. However, while a positive return at the announcement or in the following week is easily attributable to the announcement itself, it is more difficult to link to this event a positive AR six months after the announcement. Moreover, in the medium and long run, the companies with positive ARs are, on average, the same for all the sub-periods. Therefore, other factors, different from the M&A announcement, potentially explain this phenomenon.

Therefore, the evidence confirms that in the Nordic market, around 50% of the bidders had positive absolute returns immediately after the announcement during the financial crisis. Nevertheless, for instance, only 20% of them had an AR higher than 2%. At the same time, nothing can be said about the bidders' absolute returns, which were negative at the announcement and turned positive one or six months after it.

In conclusion, a common path can be identified especially for the transactions concluded during the Financial crisis: 50% of buyers' stock prices slightly increase as the response of the merger immediately at the announcement day or in the following

week, while only 20% of them had an abnormal return significantly higher than 0. All of them tend to return to the *average* rate by the end of the following year.

To understand this information, it is now necessary to observe its statistical relevance. To do so, we define the null hypothesis (H_0) as *average Abnormal returns are equal to zero*. Therefore, we are testing if we can reject the null hypothesis, and in the case of an affirmative answer, this would imply that the announcement of an M&A contributed to have positive abnormal returns. Under the null hypothesis, the abnormal returns will be jointly normally distributed with zero conditional mean and conditional variance. We, therefore, define the statistical test as:

$$T = \frac{\overline{AR}}{s/\sqrt{n}}$$

Where $\overline{AR}$ indicates the average abnormal return for the periods considered, and s indicates the ARs' standard deviation. As the usual σ_ε is unknown, the sample variance is a good proxy. For this reason, and considering the relatively small size of the sample, it is better to use the t-student distribution instead of the normal one.

The following table summarizes this information about the financial crisis:

Table 6 – Inference test on Abnormal Returns, financial crisis

The table summarizes the main ARs' statistics for five different subperiods following the M&A announcement during the financial crisis. The statistics reported are the ARs average and their standard deviation computed as the square root of the variance. The T-test is computed as ARs average divided by $s/\sqrt{n}$ where n is the number of observations in the sample.

	<i>Announc.</i>	<i>5d</i>	<i>1m</i>	<i>6m</i>	<i>1y</i>
<i>AR (average)</i>	2.26%	0.29%	1.99%	8.25%	-1.06%
<i>St. dev sample</i>	16.63%	15.86%	37.09%	84.81%	69.28%
<i>T test</i>	1.04	0.14	0.41	0.73	-0.12
<i>N</i>	59	58	58	57	57

To understand this information, the test statistic's values is compared with $t(\alpha, n-1)$. N indicates the sample size, and it is reported in the table.

If we start by selecting α equal to 5%, then in order to refuse H_0 , we need to compare it with $t(\alpha, n-1) = 2.001718$. If the value of the statistical test is outside the interval ± 2.001718 , we can refuse the null hypothesis. However, in none of the subperiods considered, it is possible to refuse the null hypothesis that the abnormal returns are

equal to zero. Hence, there is not enough statistical significance to say that the event (M&A announcement) impacted the behavior of the returns. If we lower the probability to refuse H_0 when it is true (α) to 1%, we obtain $z(\alpha, n-1) = 2.66$. Of course, also, in this case, it is not possible to refuse the null hypothesis. In conclusion, despite many companies register an abnormal return following the announcement, these are statistically not different from zero, and therefore it is not possible to refuse H_0 .

Slightly different results can be concluded for the Sovereign Debt crisis, when – on average – those companies which had a return higher than the CAPM maintained the overperformance also in the following subperiods. The only exceptions were some companies that outperformed CAPM in the week following the announcement but quickly returned to *typical* values, explaining the high pick in correspondence to that day's data. The following table and figure provide the same information reported for the financial crisis:

Table 7 - bidders' positive ARs, sovereign debt crisis

The table provides the number of positive abnormal returns registered by the bidders in the sample during the sovereign debt crisis. The abnormal returns are computed as the difference between the bidders' absolute returns and the market model (CAPM). The size is computed as ratio between the positive ARs, and the total ARs observed in the sample.

2011-2012	Announcement	5d after	1m after	6m after	1y after
# transactions with return higher than CAPM	22	26	24	21	20
Relative size	49%	58%	53%	47%	44%

Figure 19 - Sovereign debt crisis abnormal returns, deal count

The figure reports the total number of transactions considered in the sample for each subperiod. Out of them is presented the number of those transactions with Abnormal Return higher than 0%, 1%, and 2%. Data are available for the sovereign debt crisis only and are divided into five subperiods: M&A announcement, five days, one month, six months, and one year after the announcement.

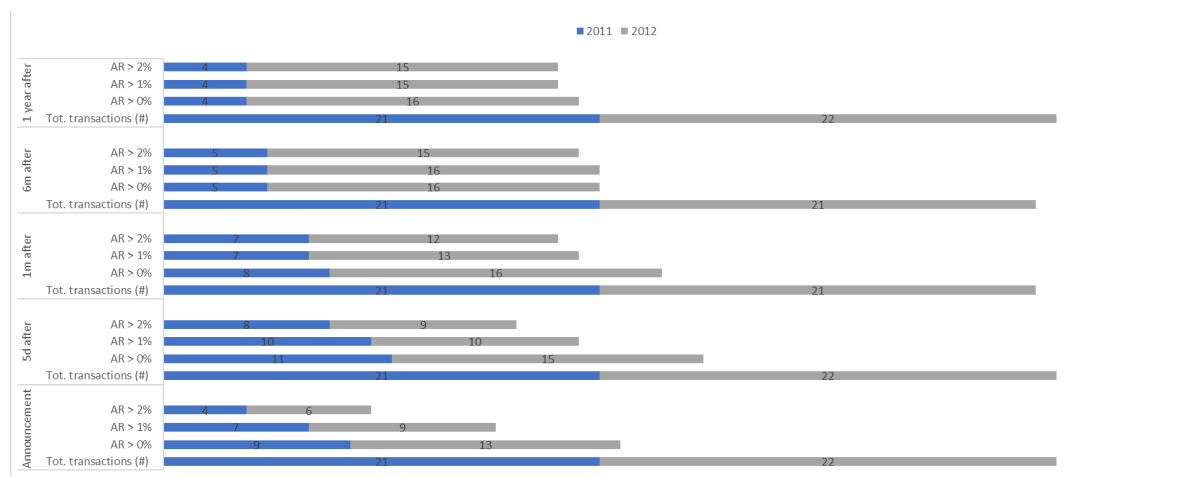


Table 19 - Inference test on Abnormal Returns, sovereign debt crisis

The table summarizes the main ARs' statistics for five different subperiods following the M&A announcement during the sovereign debt crisis. The statistics reported are the ARs average and their standard deviation computed as the square root of the variance. The T-test is computed as ARs average divided by $s/\sqrt{n}$ where n is the number of observations in the sample.

	Announc.	5d	1m	6m	1y
AR (average)	2.85%	1.78%	0.83%	-7.15%	0.68%
St. dev Var sample	0.13	0.08	0.17	0.28	0.39
T test	1.40	1.51	0.32	-1.63	0.11
N	43	43	42	42	43

Following the same approach used above, also, in this case, we cannot refuse the null hypothesis that ARs are statistically different from zero, both considering $\alpha = 1\%$ and $\alpha = 5\%$.

In conclusion, around 50% of the companies examined during both crises had a positive absolute return after a merger or acquisition announcement. Nevertheless, if we statistically analyze these returns, we can never refuse the null hypothesis that they are equal to zero. It implies that even if some companies had a positive abnormal return, on average, the magnitude of this phenomenon was not big enough to state that the M&A announcement influenced the bidders' returns behavior. Therefore, also in the Nordic market, the evidence is consistent with the literature, but some positive indications may characterize this market as a more profitable one, also for bidders.

4.2.3 Analysis of Cumulative Abnormal Returns

This chapter aggregates the abnormal returns to make a more comprehensive inference. According to MacKinlay (1996), aggregation is among two dimensions: through time and across securities. Based on MacKinlay's paper, the study is conducted as follows. Firstly, it computes the abnormal returns for all the sample transactions 20 days before and 20 days after the announcement date. It then averages the abnormal returns at each period among the securities. Finally, the Cumulative Abnormal Returns (CAR) are computed by summing the average abnormal returns. Abnormal returns are computed using the market model as the normal return.

The following graph plots the cumulative returns over the window period selected for the two crises. The most evident trend is the CAR increment around the announcement period, consistently with the abnormal returns and absolute returns analyses. Finally, to check the significance of the CAR, the same statistic test used in chapter 4.2.2. is computed and the results are reported in the next table.

Figure 20 - Bidders CAR

The graph reports the bidders' Cumulative Abnormal Returns. The blue line represents the financial crisis, while the green one the sovereign debt crisis. Bidders' CARs are computed as the sum of average ARs during the 20 days preceding and following the announcement. Abnormal returns are computed using the market model as normal returns.

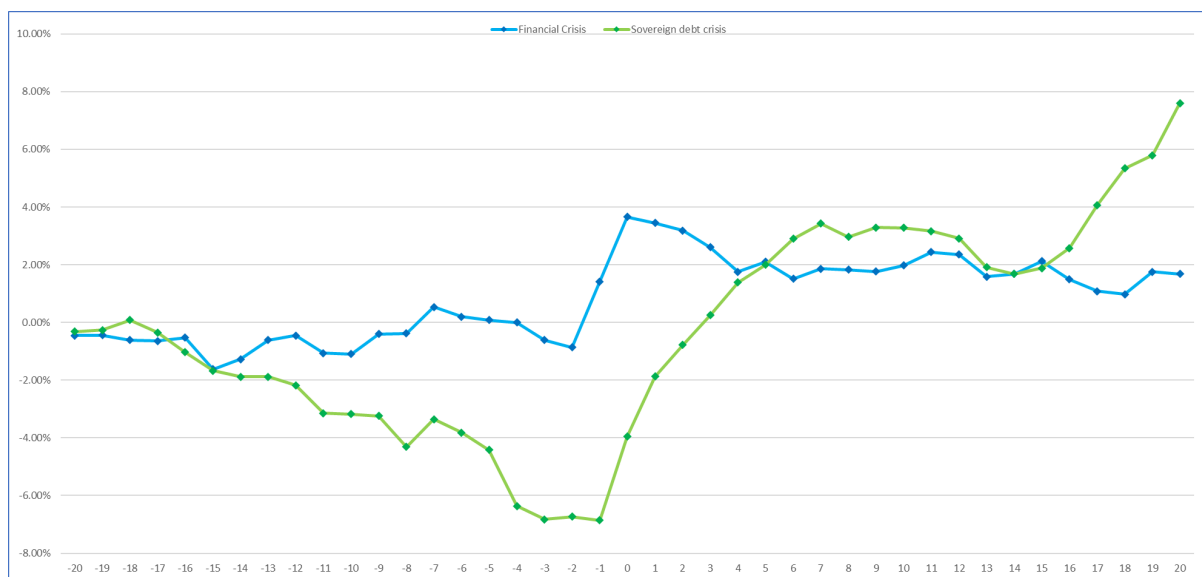


Table 20 - Inference test on Cumulative Abnormal Returns, financial crisis

The table provides a summary of the main CARs' statistics five trading days following the M&A announcement. The data are provided for both the financial and the sovereign debt crises. The statistics reported are the ARs average and their standard deviation computed as the square root of the variance. The T-test is computed as ARs average divided by $s/\sqrt{n}$ where n is the number of observations in the sample.

	<i>Financial crisis</i>	<i>Sovereign debt crisis</i>
<i>CAR (average)</i>	0.83%	-0.29%
<i>St. dev Var sample</i>	0.014273305	0.03655
<i>T test</i>	3.726231937	-0.51
<i>N</i>	41	41

The critical value of a T student distribution with 41 degrees of freedom is 2.02 for alpha = 5% and 2.701 for alpha = 1%. Hence, concerning the 2011 – 2012 crisis, it is impossible to reject the null hypothesis that CARs are equal to zero. Instead, considering the financial crisis CARs, it is possible to reject H_0 . CARs during the period 2008 – 2010 seem to be slightly different from zero and with a positive value.

In conclusion, it is impossible to confirm that the financial crisis significantly impacted the bidders' profitability when measured as abnormal returns. However, both the abnormal and cumulative abnormal returns are not statistically different from zero except for CARs between 2008 – 2010. In conclusion, the Nordic market appears as a peculiar one. Unlike most other countries, where the literature studied significant negative performance, here there are glimmers for positive abnormal returns also for the bidders.

4.3 Analysis of the returns' determinants

It is finally relevant to test some factors to understand the determinants of the positive returns previously examined. The test is based on some regression analyses using different combinations of the following independent variables:

Table 21 – Market variables used in Absolute and Abnormal returns regression analysis

The table contains a description and the source of all the independent variables used for regressing the Absolute and Abnormal returns during both the financial and the sovereign debt crisis. This table is only focused on the market variables.

Variable	Description	Source
<i>Market variable 1</i>	The variable is computed as the difference between the value of the MSCI Nordic index one month after the announcement minus its value one month before the announcement. It intends to capture the market behavior during the announcement period. A negative value would imply that the market performed negatively in the period of the announcement. If this variable highly explains returns, this will imply that a merger's announcement did not significantly impact the bidder's performance. On the contrary, a low significant value implies that the M&A explains a consistent portion of the return. Moreover, a negative coefficient value would imply that the stock return behaves in the opposite direction of the market.	Eikon - Refinitiv
<i>Market variable 2</i>	This variable is computed as the market variable 1, but instead of using MSCI index values, we used their moving averages at 7-days and 15-days intervals. This variable is a supporting variable of the previous and will be used only in some regressions.	Eikon - Refinitiv
<i>Volatility index</i>	It is the Standard and Poor's Southern Europe Low volatility index at the announcement date to capture the uncertainty of the market	Eikon - Refinitiv
<i>Momentum index</i>	It represents the velocity at which the stock prices change, identifying the trend's strength. The variable is built according to the following steps: For each transaction date, the values of the MSCI Nordic Index 1 month, two months, and six months after the announcement have been collected to compute the daily return among them. We then computed the moving average for each return weekly (5 trading days) and 15 (10 trading days) days intervals. Finally, we computed two levels of momentum, one subtracting to the 1-month moving averages the six-month moving averages and the other subtracting to the two-month, the six-month moving averages. Moreover, as we created the index considering both the weekly and the bi-weekly interval, we finally obtained four-momentum representations: - weekly momentum: 1 minus 6 months returns' moving average - bi-weekly momentum: 1 minus 6 months returns' moving average - weekly momentum: 2 minus 6 months returns' moving average - bi-weekly momentum: 2 minus 6 months returns' moving average	Eikon - Refinitiv

Below are provided two graphs representing the results of the momentum index construction. The first reports the Nordic MSCI Index returns moving averages at a 5-days interval. The two lines are computed using the Nordic MSCI Index values 1 month and six months after the M&A announcements. The second chart reports the same information for moving averages computed using Nordic MSCI Index values 2 months and 6 months after the M&A announcements.

Figure 21 - Weekly moving averages (1 month)

The graph reports the 1-month moving averages (blue line) and the six months moving averages (green line). The moving averages are computed at a weekly interval based on the MSCI Nordics Index returns. The difference between the two moving averages in each period represents the market momentum.

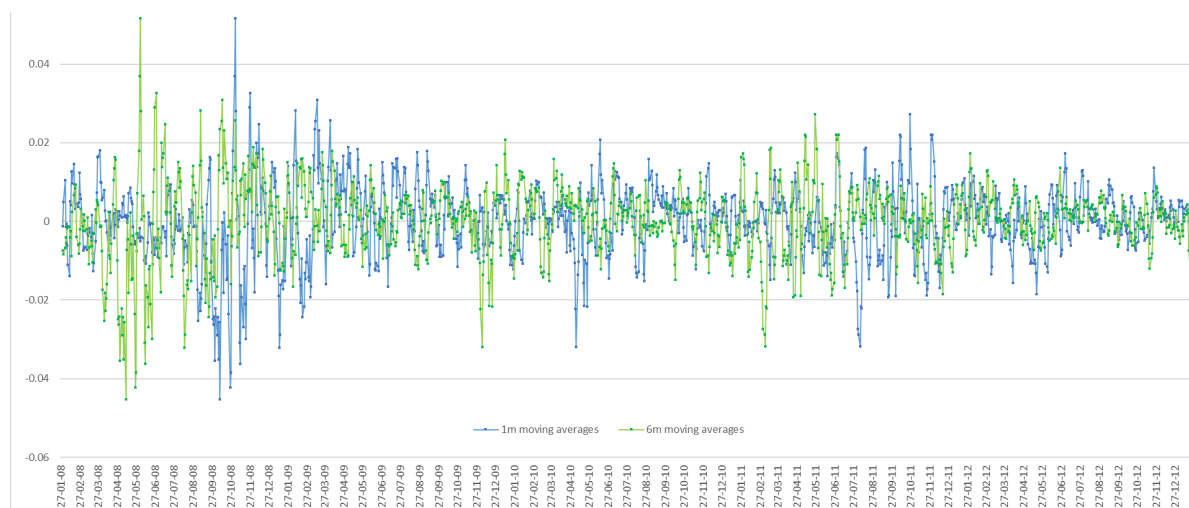
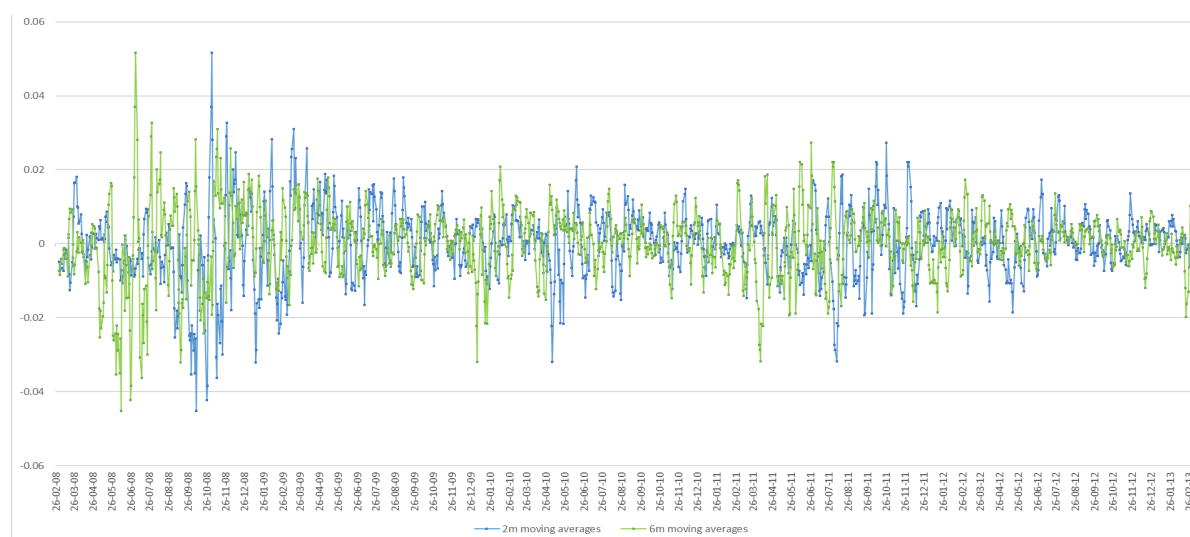


Figure 22 - Weekly moving averages (2 months)

The graph reports the 2-month moving averages (blue line) and the six months moving averages (green line). The moving averages are computed at a weekly interval based on the MSCI Nordics Index returns. The difference between the two moving averages in each period represents the market momentum.



Additionally, are included as regressors the following accounting variables:

Table 8 Accounting variables used in Absolute and Abnormal returns regression analysis

The table contains a description and the source of all the independent variables used for regressing the Absolute and Abnormal returns during both the financial and the sovereign debt crisis. Regarding the analysis of Abnormal Returns, these variables are used in Model 1. This table is only focused on the accounting variables.

Variable	Description	Source
<i>EV</i>	It is computed as Market Capitalization at fiscal year-end + Preferred Stock + Minority Interest + Total Debt minus Cash. Cash represents Cash & Due from Banks for Banks, Cash for Insurance Companies, and Cash & Short-Term Investments for all other industries. For companies with more than one type of ordinary shares, Market Capitalization represents the company's total market value calculated as the total number of listed and unlisted common equivalent shares multiplied by the price of the primary issue at the fiscal year-end date.	Eikon - Refinitiv
<i>EBITDA</i>	It represents the earnings of a company before interest expense, income taxes, and depreciation. It is calculated by taking the pre-tax income and adding back interest expense on debt and depreciation, depreciation, and amortization, and subtracting interest capitalized.	Eikon - Refinitiv
<i>FCF/Sales</i>	It is computed as Funds from Operations / Revenues * 100. Funds from Operations represent the sum of net income and all non-cash charges or credits. Where cash flow has not been disclosed in any manner, it is estimated based on net profit before preferred dividends plus depreciation, reserves charges, provision for loan losses for banks, and provision for future benefits for insurance companies.	Eikon - Refinitiv
<i>Sales Per Share</i>	It represents the per-share amount of the company's sales or revenues for the 12 months that ended the last calendar quarter of the year for U.S. corporations and the fiscal year for non-U.S. corporations.	Eikon - Refinitiv
<i>EV/EBITDA</i>	It is the ratio of the two parameters and represents the ratio between the company value and the operating margin.	Eikon - Refinitiv
<i>Net Debt/EBITDA</i>	It is the ratio between the two figures	Eikon - Refinitiv
<i>FCF Per Share</i>	It represents the cash earnings per share of the company for the 12 months that ended the last calendar quarter of the year for U.S. corporations and the fiscal year for non-U.S. corporations. The numerator used for this calculation is Funds from Operations.	Eikon - Refinitiv
<i>Long Term Debt</i>	It represents all interest-bearing financial obligations, excluding amounts due within one year. It is shown net of premium or discount.	Eikon - Refinitiv
<i>Net Debt</i>	It represents Total Debt minus Cash. Cash represents Cash & Due from Banks for Banks, Cash for Insurance companies, and Cash & Short-Term Investments for all other industries.	Eikon - Refinitiv
<i>Interest Expenses/Debt</i>	It represents the service charge for the use of capital before the reduction for interest capitalized.	Eikon - Refinitiv
<i>Total Debt</i>	It represents all interest-bearing and capitalized lease obligations. It is the sum of long- and short-term debt.	Eikon - Refinitiv

<i>CAPEX</i>	It represents the funds used to acquire fixed assets other than those associated with acquisitions. It includes but is not restricted to additions to property, plant, and equipment, investments in machinery and equipment.	Eikon - Refinitiv
<i>D/EV</i>	It is the ratio between debt and EV and represents the company's leverage.	Eikon - Refinitiv

The dependent variables are the bidders' absolute returns. The returns are computed at three different sub-periods: one week, one month, and six months after the announcement. The idea is that the stock price should reverse to the normal one after one year since the announcement. Moreover, the test already conducted on the buyers' profitability proved that on average positive and abnormal returns decrease approaching the one year.

Therefore, we first regress the stocks' returns at any of the three sub-periods selected on the four independent variables singularly, and then we repeat the procedure for all the possible combinations of independent variables creating multivariable regressions. After, we retrieve the same test using the abnormal returns as the dependent variable.

4.3.1 Absolute returns regression analysis

This paragraph researched which variables – and to what extent – impacted the buyers' stock returns during the financial crisis, i.e., the period 2008 – 2010 and then during the sovereign debt crisis.

The first independent variable is the difference between the MSCI Nordic index one month before and one month after each announcement date. The regression R^2 proves that the market variable cannot explain the return at one week of the announcement. Moreover, the high value of the F statistics confirms the low significance of this variable in explaining returns. The negative coefficient of the independent variable would be a signal of an anticyclical movement of the returns, meaning that the market behavior affects in the opposite direction the one-week returns; however, the coefficient is statistically equal to zero.

If we instead study the 1-month returns regressed on the market variables, we observe a higher R^2 (0.065806001 compared to 6.61E-05 of the one-week regression) and an

intercept still equal to zero. The multiple R, explaining the correlation between the two variables, is around 25%. Indeed, after a month, we can expect a lower benefit coming from the M&A announcement and a consequential higher impact of the market movements on the returns. A similar conclusion can be made for the six-month returns, even if the values are pretty smaller. It is partially a consequence of the index construction, which is built as the difference of 1 month before and one month after MSCI Nordic values and therefore is much less correlated with the six-month stock prices. Moreover, as we observe in the previous analysis, the significance of absolute returns decreases over time. In conclusion, it is impossible to consider the market variables significant in explaining the bidders' returns as the regressions' results are feeble.

The second variable used in the regression is market volatility. The results obtained by this analysis are similar to those of the previous one. All the regressions are not highly significant, and the R squared increases with time, reaching a maximum of 7% for the six-month returns. The independent variable coefficients are all in the surroundings of zero, and the p-values are incredibly high and hence not significant. In conclusion, the volatility index does not help in explaining Nordics bidders' returns in the financial crisis, even if we combine the volatility index with the market variable. Once again, the higher results – R^2 of 12% and F significance around 2-3% - are observed for the six-month returns. However, the volatility index is the one – among the independent variables considered - which can explain the higher portion of returns, even though this analysis remains not significant.

The third analysis regards the regression of the absolute returns on the different momentum variables created. Independently from which of the four computations we select, the results are pretty similar, implying that different computations of the moving average hardly help improve the return explanation. Starting for one-week returns, they are not explained by any one of the momentum representations. The R^2 and multiple R are both close to 0 and the F significance close to 1. The only exception regards the weekly momentum as the difference of 2-6 months. In this case, the R^2 is slightly higher, around 6%, and the F statistic is only slightly above 5% (6.7%). While it is still not significant, it explains the higher portion of returns and the best momentum representation. Therefore, we can conclude that returns after one week are not explained by momentum, but this is quite in line with the low significance of the market

variable. Indeed, as the momentum represent the speed of the price variation, and as the prices hardly impact the bidders' returns immediately after the announcement, it is consistent that also their speed is not significant.

The significance of each regression increases with the timing if momentum is computed as a difference between 1 month and six-month values, while it is more significant at one week for the other variables. Therefore, different momentum computation better explains returns at different periods. However, both the R^2 and the F significance signal a low significance level, excluding momentum as a good predictor.

Finally, it is provided with a combination of all the different variables. The significance of the regression having as independent variables the difference between MSCI Nordics value and the momentum (2-6 months) improves for the one week, benefiting from the second variable. Indeed, the R squared is almost 7%, and the momentum coefficient is the only one significantly different from zero (-2.6893) but with a p-value around 6.7%. Similar results are obtained if we also include the volatility variable. Moreover, combining all the other variables, we cannot observe any improvement in the prediction power, and the F significance is always higher than 5%.

In conclusion, we can confirm that the market does not explain the returns of the bidders' companies during the financial crisis in the period close to the announcement. In other words, this set of the analysis proves that CAPM – which is a linear relationship between the stock return and the market return – stops to work for the M&As' buyers during the financial crisis. The regressions Beta for those companies is close to zero and not significant, meaning that the majority of their return is explained by other sources different from the market.

However, in the medium run (6 months), it seems that the market starts to return to play a role in defining bidders' returns. Analyzing the difference of MSCI Nordics moving averages, the R^2 is higher than 35%, and the beta coefficient remains slightly negative. This finding is in line with the analysis of abnormal return, which decreases approaching the year both in terms of number and statistical significance. Thus, over time the announcement effect decreases, and the bidders' returns align with CAPM. Moreover, combining this variable with the one first studied, the regression R squared

increased compared to the first test, and the coefficients of both the variables remain negative. By studying the same regressions' combination, the multiple R and the R^2 increase over time. It confirms that, while at the announcement, the market trend does not impact the returns, after six months, their predicting power increases.

The fourth and last test regards the regression of the absolute returns on some accounting figures. The analysis starts by including all those variables mentioned above to identify the most significant ones, adjusting the set of variables based on the results of the first regression.

The one-week returns regression has an R squared of 36%, including all the variables (Model 1). It decreases around 16% for the one-month returns and booms to over 84% for the six-month returns. However, the only high significant variables for weekly returns are the FCF per share (p-value around 0.1%) and the D/EV (p-value of 4%). It implies that these variables explain almost the whole return. However, the regression of weekly returns on only the FCF per share has a 3.6% R^2 and a non-significant coefficient. Hence, it is possible to conclude that one week after the announcement, the returns are well explained by FCF per share and D/EV only if considered in a more extensive set of variables.

The FCF/SALES and the FCF per share variables represent the ability of the company to produce cash flows. Their importance may be linked to the ability of the company to produce CFO useable to repay the eventual debt involved in the M&A. Indeed; we can expect the market to price the bidders' stock also based on their ability to generate cash, especially if they are pursuing a merger in a period of general financial distress. *Additionally, Payment of cash to shareholders reduces the resources under managers' control, thereby reducing managers' power and potentially subjecting them to the monitoring by the capital markets that occurs when a firm must obtain new capital* (Michael C. Jensen, 1987). Moreover, the market in pricing stocks values earning and future growth and indirectly the cash flows (higher the investments in future growth, lower the CFs). Finally, cash flows should be paid out to shareholders if the firm wants to maximize shareholders' value. All these aspects confirm the relevance of this parameter in explaining the stock price.

A similar conclusion can be made for the ratio D/E, which indicated the bidder's indebtedness and, therefore, its ability to support a potential new debt injection both for finance the merger or coming from the target. This variable represented the leverage ratio of the company and resulted among the most significant ones.

To test the significance of these variables, we also tried to modify the set, eliminating those correlated as FCF/Sales and FCF per share. We left the first one and removed the second as the indication *per share* does not seem to affect the valuation without knowing the number and the value of shares issued by each company. We also removed Net Debt and Long-term Debt, which is correlated with total debt.

The result is less significant by removing these variables, with an R^2 decreasing to 17%, and the only significant variable is the D/EV with a p-value of 2% (FCF/Sales p-value is higher than 7%), according to Model 2. Indeed, regressing the one-week returns on the D/E ratio alone, the R squared is 8% and a p-value slightly lower than 3%. Similar results are obtained with different combinations of independents variables, but the results improve (R^2 of 27%) if we substitute FCF per shares to FCF/Sales in the last set of variables, confirming the high significance of the first.

The returns in the week after the announcement are highly influenced by accounting figures, particularly by the company's debt level and its ability to generate cash. Moving to one-month returns, these are in general less explained by balance sheet items. In this case, by reducing the number of variables involved, we reduce the significance of the model. Moreover, the D/EV ratio remains the most significant variable followed – in this case – by the FCF/Sales. Finally, analyzing the six months after the announcement returns, we observe an extremely high R^2 (84%), which, again, slightly decreases if we remove some variables. The most significant one, in this case, is only FCF/SALES, while the D/EV p-value increases to 13%.

The ratio EV/EBITDA has been included in the regressions to study the company's cash generation. However, it resulted in no significance at any of the sub-periods considered. Its p-value is always higher than 40%, and the coefficient is statistically equal to zero. Therefore, although it is a crucial determinant in M&A valuations, it seems not to affect the bidders' ability to generate returns.

In conclusion, the accounting figures are the ones which better helps in explaining the bidders' returns (during the financial crisis), especially one week after the announcement. The market non-relevance and the D/E ratio high significance suggest that the stock prices are much more influenced by the quality of the transaction rather than by the macro-economic context. The most relevant statistic information for weekly returns is summarized in the following table, while a complete one is reported in the appendix (attachment 1).

Table 9 - Results of Absolute Returns regressions on market variables, financial crisis

The table summarizes the results of regressing bidders' Absolute Returns one week after the M&A announcement on the market variables before mentioned. Different studies consider different variables. The value reported are the variables coefficients, the regression significance, and the F significance. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively.

5 DAYS ABSOLUTE RETURNS					
	<u>R square</u>	<u>F significance</u>	<u>Variable 1</u> <u>coefficient</u>	<u>Variable 2</u> <u>coefficient</u>	<u>Variable 3</u> <u>coefficient</u>
<i>MSCI Difference</i>	0.0066%	0.9517	-1.68E-06		
<i>Volatility</i>	0.1461%	0.7758	4.30E-05		
<i>Mom. Week (1-6)</i>	0.0753%	0.8380	0.3464		
<i>Mom. Week (2-6)</i>	5.8511%	0.0673	-2.6543*		
<i>Mom. BI - Week (1-6)</i>	0.0293%	0.8986	-0.3179		
<i>Mom. BI - Week (2-6)</i>	2.0998%	0.2778	-2.9183		
<i>MSCI & Volatility</i>	0.1485%	0.9600	-1.02E-06	4.25E-05	
<i>MSCI & Mom. Week (1-6)</i>	0.0961%	0.9739	-3.05E-06	0.3871	
<i>MSCI & Mom. Week (2-6)</i>	5.9546%	0.1848	-6.67E-06	-2.6893*	
<i>MSCI & Mom. BI - Week (1-6)</i>	0.0294%	0.9919	2.74E-07	-0.3310	
<i>MSCI & Mom. BI - Week (2-6)</i>	2.2138%	0.5403	7.25E-06	-3.1165	
<i>Volatility & Mom. Week (1-6)</i>	0.2098%	0.9439	4.13E-05	0.3192	
<i>Volatility & Mom. Week (2-6)</i>	5.9801%	0.1835	4.04E-05	-2.6505*	
<i>Volatility & Mom. BI - Week (1-6)</i>	0.1998%	0.9465	4.70E-05	-0.4358	
<i>Volatility & Mom. BI - Week (2-6)</i>	2.3370%	0.5219	5.49E-05	-2.9887	

<i>MSCI & Vol. & Mom.</i> <i>Week (1-6)</i>	0.2215%	0.9892	-2.30E-06	4.01E-05	0.3507
<i>MSCI & Vol. & Mom.</i> <i>Week (2-6)</i>	1.0179%	0.9061	-1.59E-06	9.45E-05	-8.58E-06
<i>MSCI & Vol. & Mom. BI -</i> <i>Week (1-6)</i>	0.2087%	0.9901	2.34E-06	4.92E-05	-0.5532
<i>MSCI & Vol. & Mom. BI -</i> <i>Week (2-6)</i>	2.4914%	0.7114	8.49E-06	5.98E-05	-3.2269

Table 10 - Results of Absolute Returns regressions on accounting variables, financial crisis

The table summarizes the results of regressing bidders' absolute returns on the independent variables before mentioned. Different studies consider different variables, and the dependent variable is always the absolute returns 5 days after the announcement. The values reported are the coefficients of the variables. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively.

	<i>Model 1</i>	<i>Model 2</i>
<i>R square</i>	36.42%	17.36%
<i>F significance</i>	0.0750	0.4170
<i>EV/EBITDA</i>	-0.0007	-0.0004
<i>FCF SALES</i>	0,000012*	0,000012*
<i>FCF PER SHARE</i>	-0,00081***	
<i>EV</i>	-3.80E-09	-2.67E-09
<i>SALES PER SHARE</i>	2.45E-05	
<i>EBITDA</i>	1.36E-08	3.95E-09
<i>NET DEBT/EBITDA</i>	0.00025	0.00044
<i>NET DEBT</i>	2.33E-09	
<i>LONG TERM DEBT</i>	-5.88E-09	
<i>INTEREST EXENSES/DEBT</i>	-4.97E-08	3.32E-09
<i>TOTAL DEBT</i>	1.34E-08	7.12E-09
<i>CAPEX</i>	-3.72E-08	-8.03E-09
<i>D/EV</i>	-0,20767**	-0,25411**

Together with the different periods, the same independent and dependent variables are used to pursue the same analysis on the 2011-2012 crisis.

Starting from the market variables, they better explain the absolute returns if considered one week after the announcement, and then the level of significance decreases, approaching 1-month and six-month returns. Concerning returns one week after the announcement, the R^2 is 12% and the F significance 2.2%. The beta coefficient, instead, remains equal to zero but significant (2% p-value). If we consider

the market variables as the difference of the index moving averages, we observe a higher significance at six months. Therefore, the sovereign debt crisis results seem to be inverted compared to those of the financial crisis.

Studying the volatility, we obtain results similar to those just reported, with higher significance for returns after one week from the announcement. Moreover, combining these variables, the R squared – for the one-week returns – ranges between 15-20% depending on the model, with levels of F significance lower than 3%. Similar results are reported for the six-month returns, and the only difference regards the one-month returns, which seem less explainable by market variables.

Finally, the momentum – considered singularly – is not significant in predicting absolute returns at any subperiod considered. Also, in the case of the sovereign debt crisis – as observed for the financial one – the computation of momentum as the difference of 2-6 months moving averages results slightly more significant. Moreover, the bi-weekly moving average's interval seems a bit better than the weekly one. However, in general, none of these regressions is significant, except for the bi-weekly momentum (1-6) and one-month returns. In this case, the R^2 increases to 10%, but it is not relevant in determining momentum significance as it is a singular case. In other words, the market speed is – on average – not relevant in predicting bidders' returns during the 2011 - 2012 crisis. The regression significance does not increase much more by combining the momentum variable with the market and the volatility variables. It is true, especially for one-week returns, proving that momentum does not help explain returns even if combined with other variables. If we instead study the one-month and six-month returns, the R squared of the regressions obtained using market variables, volatility, and momentum improves by 3-5 percentage points compared to using only market and volatility.

In conclusion, the market does not fail to predict returns as it did in the previous case, especially in the one-week and six-month returns. The difference between these results and the financial crisis can be explained by the lower impact this crisis had on the Nordic market. Indeed, the previous studies showed that the typical M&As crisis behavior (decrease in the number of deals and the correspondent increment of the deals' value) is not accentuated as in other crises. Therefore, if the Nordic economy

was less affected by the sovereign debt crisis, it is not surprising to observe that the M&A market did not react as it did in the previous financial crisis. We can describe this situation as *in the middle*, between the one previously observed, where the market does not explain bidders' returns, and the normal condition when the market is one of the most determinant variables. In other words, during the sovereign debt crisis, the Nordic market was less affected by the crisis itself, which was reflected in the M&As market.

Concluding with the analysis of the accounting figures on the absolute returns, we observe quite different results. Indeed, while there is a difference among the financial crisis sub-periods, the accounting figures in this case always explain 30% of the absolute returns. Moreover, the most significant variables are the EV in the case of returns computed one week after the announcement (Model 1), the D/EV for one month after returns, and the FCF/Sales in the case of six-month returns. Proceeding in adjusting the set of variables as did before, the significance of the regressions decreases as observed for financial crisis data. Moreover, by shrinking the set of variables, the D/EV becomes the most significant one (Model 2).

In conclusion, it appears that – independently from the period studied – the leverage ratio remains the most significant variable, even though the significance of the regressions and the variables changes depending on the crisis studied and the period considered. However, this is not surprising as in the M&A process the debt level is a crucial determinant in defining the feasibility and the profitability of the deal. The relevance of the EV parameter instead increases compared to the financial crisis, while the importance of the cash flow generation is comparable. The most relevant statistic information for weekly returns is summarized in the following table, while a complete one is reported in the appendix (attachment 3).

Table 11 - Results of Absolute Returns regressions on market variables, sovereign debt crisis

The table summarizes the results of regressing bidders' Absolute Returns one week after the M&A announcement on the market variables before mentioned. Different studies consider different variables. The value reported are the variables coefficients, the regression significance, and the F significance. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively.

5 DAYS ABSOLUTE RETURNS					
	<u>R square</u>	<u>F significance</u>	<u>Variable 1</u> <u>coefficient</u>	<u>Variable 2</u> <u>coefficient</u>	<u>Variable 3</u> <u>coefficient</u>

MSCI Difference	12.15%	0.021980963	5.751E-05**	
Volatility	17.50%	0.005248579	0.00026***	
Mom. Week (1-6)	0.85%	0.556686054	-1.0036	
Mom. Week (2-6)	1.79%	0.391944789	0.940272759	
Mom. BI - Week (1-6)	3.72%	0.391944789	0.940272759	
Mom. BI - Week (2-6)	3.95%	0.20134089	1.918671915	
MSCI & Volatility	20.96%	0.009058352	3.40427E-05	0.00021**
MSCI & Mom. Week (1-6)	14.90%	0.039727742	6.313E-05**	-1.842001
MSCI & Mom. Week (2-6)	13.96%	0.049420605	5.755E-05**	0.945017
MSCI & Mom. BI - Week (1-6)	12.49%	0.069424077	5.332E-05*	0.771845
MSCI & Mom. BI - Week (2-6)	13.92%	0.049934062	5.312E-05**	1.308593
Volatility & Mom. Week (1-6)	18.54%	0.016539082	0.00026***	-1.114316
Volatility & Mom. Week (2-6)	20.83%	0.009349674	0.00028***	1.291016
Volatility & Mom. BI - Week (1-6)	19.02%	0.01471211	0.00025***	1.525587
Volatility & Mom. BI - Week (2-6)	20.32%	0.010646736	0.00025***	1.625853
MSCI & Vol. & Mom. Week (1-6)	23.06%	0.015809249	3.97857E-05	0.0002** -1.615597
MSCI & Vol. & Mom. Week (2-6)	23.96%	0.012783833	3.23713E-05	0.00022** 1.225120
MSCI & Vol. & Mom. BI - Week (1-6)	21.31%	0.023747564	2.97677E-05	0.00021** 0.784741
MSCI & Vol. & BI - Week (2-6)	22.82%	0.016739553	2.94172E-05	0.00021** 1.342028

Table 12 - Results of Absolute Returns regressions on accounting variables, sovereign debt crisis

The table summarizes the results of regressing bidders' absolute returns on the independent variables before mentioned. Different studies consider different variables, and the dependent variable is always the absolute returns 5 days after the announcement. The values reported are the coefficients of the variables. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively.

	<i>Model 1</i>	<i>Model 2</i>
<i>R square</i>	36.07%	26.86%
<i>F significance</i>	0.3809	0.3176
	Coefficient	Coefficient
<i>EV/EBITDA</i>	0.00080	0.00018
<i>FCF SALES</i>	0.00138	0.00131

<i>FCF PER SHARE</i>		-0.00068	
	<i>EV</i>	-2,802E-09*	-2,7172E-09*
<i>SALES PER SHARE</i>		-0.00044	
	<i>EBITDA</i>	3.23E-09	5.70E-09
<i>NET DEBT/EBITDA</i>		-0.00299	0.00104
<i>NET DEBT</i>		-8.52E-09	
	<i>LONG TERM DEBT</i>	-1.09E-09	
	<i>INTEREST EXPENSES/DEBT</i>	-7.54E-08	-6.96E-08
<i>TOTAL DEBT</i>		1.84E-08	7.91E-09
<i>CAPEX</i>		-9.12E-09	-1.02E-08
<i>D/EV</i>		-0.12764	-0,1568**

4.3.2. Abnormal returns regression analysis

The same regressions previously analyzed are now retrieved using the Abnormal Returns over the CAPM as the dependent variable. For consistency, we regress them at the same sub-periods: one week, one month, and six months after the M&A's announcement, and we will follow the same order in the results' discussion.

The study starts from the financial crisis: the regression of the one week after the M&A announcement abnormal returns over the difference between the MSCI Nordics value. The results of this regression are perfectly in line with the corresponding analysis on the absolute returns. It proves that the market does not explain the abnormal returns. The negative value for the beta confirms the negative relation between the two variables, even though we have to remind that only a small part of the returns is expressed by this variable, as confirmed by low levels of multiple R and R². The values are perfectly aligned with the previous analysis for the 1-month and six-month regressions, implying that the same conclusion of the absolute returns is valid for the abnormal ones.

The regressions completed on the different computation of the market variable conduce the same conclusions made for the absolute returns concerning the weekly and one-month after returns. A slightly different result can instead be observed for the six-month excess returns. Indeed, while the R squared remains around 12% for all the four computations, the F significance is well below the 5% limit (around 0.0053 in the case of weekly moving average and similar for the other alternatives). Moreover, the

beta coefficient (-0.000229), which is still negative and close to zero, is much more significant in this case, with a p-value lower than the 5% confidence level adopted.

A not significant difference can be noticed regarding the variance and the momentum analysis compared to absolute returns. The only significant variable is the same of the absolute returns' analysis. The momentum variable computed at a two-week interval as the difference of 2 months minus six months moving averages is the only one significant. In conclusion, during the financial crisis, the bidders' abnormal returns seem to be not explained by CAPM and, in general, by the market. The following table summarizes the main results for ARs one week after the announcement. The most relevant statistic information for weekly returns is summarized in the following table, while a complete one is reported in the appendix (attachment 2).

Table 137 - Results of Abnormal Returns regressions on market variables, financial crisis

The table summarizes the results of regressing bidders' Abnormal Returns one week after the M&A announcement on the market variables before mentioned. Different studies consider different variables. The value reported are the variables coefficients, the regression significance, and the F significance. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. This table provides results for the financial crisis analysis.

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	<u>R square</u>	<u>F</u> <u>significance</u>	<u>Variable 1</u> <u>coefficient</u>	<u>Variable 2</u> <u>coefficient</u>	<u>Variable 3</u> <u>coefficient</u>
MSCI Difference	0.0057%	0.9551	-1.56E-06		
Volatility	0.1434%	0.7777	4.26E-05		
Mom. Week (1-6)	0.0756%	0.8376	-0.3473		
Mom. Week (2-6)	5.8523%	0.0673	2.6553*		
Mom. BI - Week (1-6)	0.0293%	0.8986	0.3179		
Mom. Bi - Week (2-6)	2.1080%	0.2768	2.9248		
MSCI & Volatility	0.1454%	0.9608	-9.08E-07	4.22E-05	
MSCI & Mom. Week (1-6)	0.0949%	0.9742	-2.94E-06	-0.3864	
MSCI & Mom. Week (2-6)	5.9522%	0.1850	-6.55E-06	2.6897*	
MSCI & Mom. BI - Week (1-6)	0.0296%	0.9919	4.36E-07	0.3388	
MSCI & Mom. Bi - Week (2-6)	2.2265%	0.5384	7.40E-06	3.1269	
Volatility & Mom. Week (1-6)	0.2076%	0.9445	4.10E-05	-0.3204	
Volatility & Mom. Week (2-6)	5.9788%	0.1835	4.00E-05	2.6515	
Volatility & Mom. BI - Week (1-6)	0.1969%	0.9472	4.66E-05	0.4349	
Volatility & Mom. Bi - Week (2-6)	2.3420%	0.5211	5.46E-05	2.9947	

MSCI & Vol. & Mom. Week (1-6)	0.2182%	0.9895	-2.19E-06	3.98E-05	-0.3504
MSCI & Vol. & Mom. Week (2-6)	6.0610%	0.3330	-5.97E-06	3.73E-05	2.6831*
MSCI & Vol. & Mom. BI - Week (1-6)	0.2070%	0.9902	2.49E-06	4.89E-05	0.5598
MSCI & Vol. & BI - Week (2-6)	2.5015%	0.7101	8.63E-06	5.95E-05	3.2368

Finally, the Abnormal Returns are regressed on some accounting figures. The first regression model (Model 1) includes all the accounting variables used for absolute returns. According to Model 1, Abnormal Returns one week after the announcement are less explained by accounting figures than absolute returns. The R^2 decreases to 28%, and the p-values slightly increase. However, the most significant variable remains the FCF per share. Modifying the set of variables as done before, we obtain the same results, even if they still are less significant. Similar considerations can be made for the abnormal returns at one month and six months after the announcement. We can conclude that the excess returns are less explained than the absolute ones – by accounting figures. It is not surprising because we can expect these items to affect more the generic company's performance rather than its relative value to the CAPM. Moreover, on average, the bidders' abnormal returns are not statistically significant, and these figures can hardly explain them.

However, analyzing the Variance Inflation Factors, some of the variables used in Model 1 resulted correlated. Therefore, we eliminated from the set of independent variables those with a VIF score higher than 3. The final set of variables used includes:

Table 14 - Accounting variables used in Abnormal Returns regression analysis, Model 2

The table contains a description and the source of all the independent variables used for regressing the Absolute and Abnormal returns during both the financial and the sovereign debt crisis in Model 2. This table is only focused on the accounting variables.

Variable	Description	Source
<i>EV/EBITDA</i>	Computed as in Model 1	Eikon - Refinitiv
<i>FCF/SALES</i>	Computed as in Model 1	Eikon - Refinitiv
<i>FCF PER SHARE</i>	Computed as in Model 1	Eikon - Refinitiv

<i>LOG(REV)</i>	It represents the company size. It includes gross sales and other operating revenue less discounts, returns, and allowances. It has been considered in logarithm value.	Eikon - Refinitiv
<i>ROE</i>	The index is computed as the ratio between Net Income and Common Equity. It represents the company's profitability.	Eikon - Refinitiv
<i>D/EV</i>	Computed as in Model 1	Eikon - Refinitiv
<i>TA</i>	It represents the company size. It includes the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets. It has been considered in logarithm value.	Eikon - Refinitiv

By analyzing Model 2 regression's results, we observe that the model significance decreases in terms of R^2 , which is now 11.7%. However, the analysis is more robust as all VIF scores are lower than 2. Model 2 includes some new variables such as ROE and Total Revenues, which indicate the profitability and the size of the companies, respectively. Regarding the first, the ROE coefficient is not significant, like all the other coefficients in Model 2. Hence the profitability does not explain bidders' abnormal returns one week after the announcement.

Regarding the size, a similar conclusion can be achieved, the p-value is above the threshold, also in this case. Moreover, we included one more test on companies' size. We reported in a graph the total asset and total revenues values in euro for each company in the announcement period. Total asset represents the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets. Total revenues represent gross sales and other operating revenue less discounts, returns, and allowances. For each company is presented the value of the Abnormal Return registered by the bidder in the first week after the announcement and its size represented by total asset and total revenues values in euro.

Figure 23 - bidders' total assets and total revenues (€), financial crisis

The figure reports bidders' Total Assets and Total Revenues. They are two representations of companies' size. Data are available for bidders during the financial crisis and are presented in euro million.

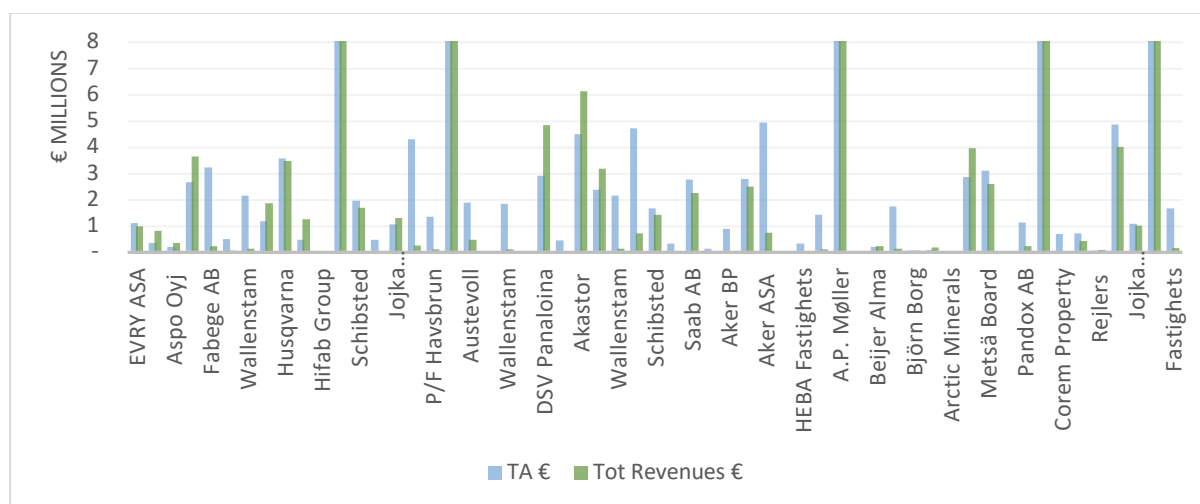
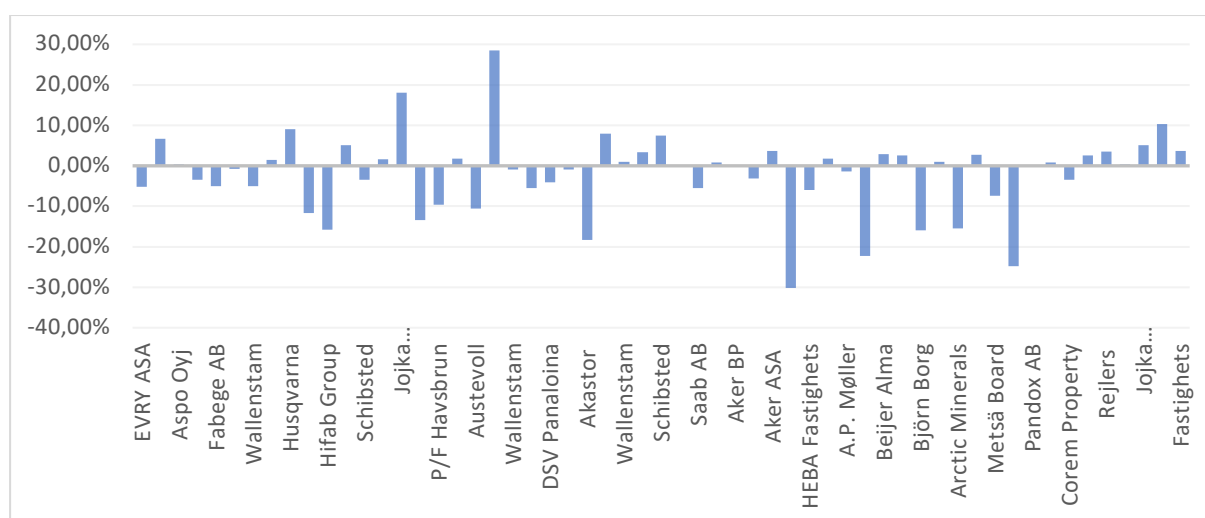


Figure 24 - Bidders' abnormal returns, financial crisis

The figure reports bidders' Abnormal during the financial crisis. Abnormal Returns are computed as the difference between absolute returns and normal returns. The market model has been used as normal return.



By comparing the two graphs, no specific trend can be identified regarding the size. The positive abnormal returns are present both for companies with high and low total asset values. Therefore, the company's size does not seem to be related to its ability to obtain a positive abnormal return at the M&A announcement, as concluded in the regression.

A summary of the results obtained by regressing Bidders ARs during the financial crisis on accounting figures is provided in the following table:

Table 15 - ARs accounting figures regression results, financial crisis

The table summarizes the results of regressing bidders' ARs on the independent variables before mentioned. Different studies consider different variables. The values reported are the variables coefficients and VIFs together with the regressions' R² and F significance. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively.

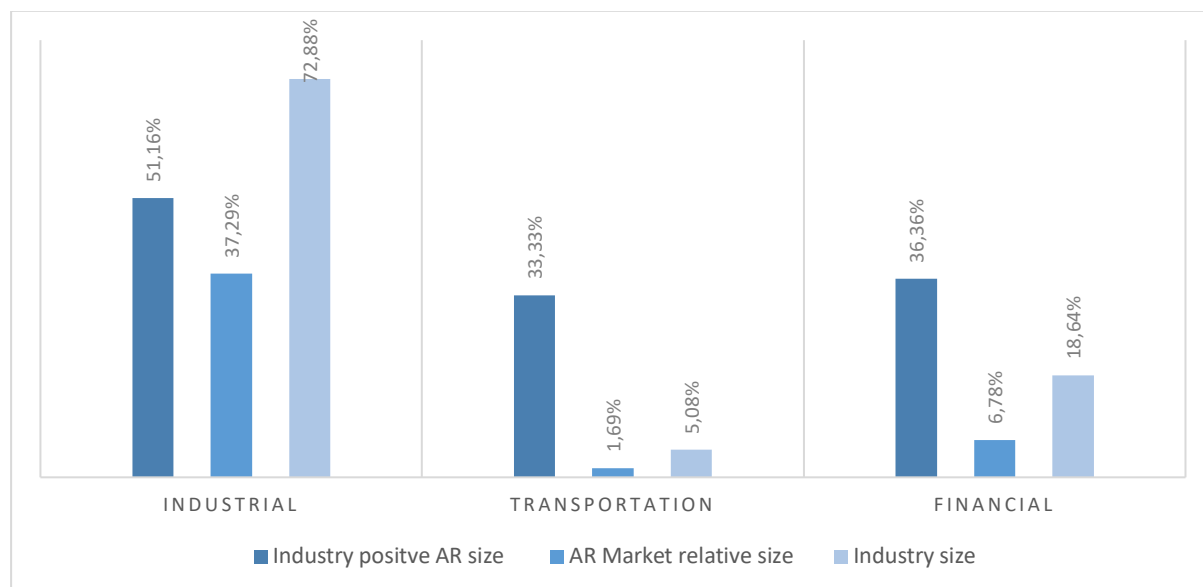
	Model 1		Model 2	
<i>R</i> ²	28.38%		11.69%	
<i>F</i> significance	0.2627		0.3865	
	Coefficient	VIF	Coefficient	VIF
<i>EV/EBITDA</i>	-0.00013	3.2712	-0.0001	1.1416
<i>FCF SALES</i>	8.99E-06	1.0702	0.0000	1.2000
<i>FCF PER SHARE</i>	-0.00090***	6.3610	-0.0002	1.0627
<i>LOG(REV)</i>			-0.0169	1.5610
<i>ROE</i>			0.0002	1.4798
<i>EV</i>	-2.84E-09	93.9265		
<i>SALES PER SHARE</i>	5.46E-05	79.4288		
<i>EBITDA</i>	1.33E-08	270.7551		
<i>NET DEBT/EBITDA</i>	0.00028	1.1211		
<i>NET DEBT</i>	-3.88E-09	157.1014		
<i>LONG TERM DEBT</i>	-2.34E-09	378.8399		
<i>INTEREST</i>	-3.38E-07	369.1417		
<i>EXENSES/DEBT</i>				
<i>TOTAL DEBT</i>	2.97E-08	679.7355		
<i>CAPEX</i>	-4.48E-08	547.2943		
<i>D/EV</i>	-0.12393	2.0665	-0.0848	1.1269

Finally, to include a sector analysis, the following graph is presented. It reports information on the percentage of positive Abnormal Returns in each industry (first bar). It is computed as the ratio between the positive AR number and the number of transactions concluded in each industry. The second, instead, indicated the positive ARs size in each industry relative to the overall market, thus considering at the denominator of the ratio the deals concluded in all the industries. Finally, the last bar represents the size that each specific industry has in the market. It is computed as the ratio between the industry number of deals over the total deals considered in the sample.

Figure 25 - Abnormal returns by industry, financial crisis

The figure reports bidders Abnormal Returns in each sector available in the sample. The dark blue column represents the number of positive ARs in an industry over the total transaction number belonging to the same industry. The blue column

represents the number of positive ARs in an industry over the total number of transactions belonging to all the industries available. The light blue column represents the industry's size relative to the total number of transactions present in the sample. Data are provided for the financial crisis.



Around 37% of the transactions with positive abnormal returns belong to the industrial sector, which is indeed the most active one in the sample (around 73%). 50% of these transactions had an abnormal return higher than zero. Concerning the transportation industry, on average, 1/3 of the deals had an AR higher than zero, representing less than 2% of the total deals as this industry accounts for only 5% of the overall sample market. Around 35% of bidders in the financial industry, which accounts for 20% of the sample, had a positive abnormal return.

The same study is repeated by regressing the abnormal returns – at the same dates – on the same independent variables for the sovereign debt crisis.

Concerning the market and volatility indexes, the results are perfectly in line with the previous. The significance is higher in explaining the abnormal returns computed a week after the announcement, and the coefficients are statistically acceptable (p-values lower than 5%). Therefore, the market model can correctly explain the excess returns.

Moving to momentum analysis, they remain not significant in predicting abnormal returns, with the only exception already present for the absolute returns. Combining them with the other variables, they again only partially improve the significance of the

regressions. We can observe that they probably give a better contribution (2-3 more percentage points) than absolute returns. The most relevant statistic information for weekly returns is summarized in the following table, while a complete one is reported in the appendix (attachment 4).

Table 30 - Results of Abnormal Returns regressions on market variables, sovereign debt crisis

The table summarizes the results of regressing bidders' Abnormal Returns one week after the M&A announcement on the market variables before mentioned. Different studies consider different variables. The value reported are the variables coefficients, the regression significance, and the F significance. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. This table provides results for the sovereign debt crisis analysis.

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	<u>R</u>	<u>F</u>	<u>Variable 1</u>	<u>Variable 2</u>	<u>Variable 3</u>
	<u>square</u>	<u>significance</u>	<u>coefficient</u>	<u>coefficient</u>	<u>coefficient</u>
MSCI Difference	12.19%	0.0218	5.75E-05**		
Volatility	17.52%	0.0052	0.00026***		
Mom. Week (1-6)	0.82%	0.5635	9.88E-01		
Mom. Week (2-6)	1.76%	0.3967	-9.33E-01		
Mom. BI - Week (1-6)	3.75%	0.2136	-2.36E+00		
Mom. Bi - Week (2-6)	3.97%	0.2000	-1.93E+00		
MSCI & Volatility	21.00%	0.0090	3.42E-05	0.00021**	
MSCI & Mom. Week (1-6)	14.88%	0.0398	6.33E-05**	1.83E+00	
MSCI & Mom. Week (2-6)	13.96%	0.0494	5.78E-05**	-9.37E-01	
MSCI & Mom. BI - Week (1-6)	12.53%	0.0687	5.35E-05*	-7.80E-01	
MSCI & Mom. Bi - Week (2-6)	13.97%	0.0493	5.33E-05**	-1.32E+00	
Volatility & Mom. Week (1-6)	18.53%	0.0166	0.00027***	1.10E+00	
Volatility & Mom. Week (2-6)	20.81%	0.0094	0.00028***	-1.28E+00	
Volatility & Mom. BI - Week (1-6)	19.05%	0.0146	0.00025***	-1.54E+00	
Volatility & Mom. Bi - Week (2-6)	20.36%	0.0105	0.00025***	-1.63E+00	
MSCI & Vol. & Mom. Week (1-6)	23.05%	0.0158	3.99E-05	0.0002**	1.60E+00
MSCI & Vol. & Mom. Week (2-6)	23.95%	0.0128	3.25E-05	0.00022**	-1.22E+00
MSCI & Vol. & Mom. BI - Week (1-6)	21.35%	0.0235	2.99E-05	0.00021**	-7.93E-01
MSCI & Vol. & Bi - Week (2-6)	22.87%	0.0165	2.95E-05	0.00021**	-1.35E+00

Regarding the regressions completed using accounting figures, the results do not significantly differ from those concluded for absolute returns. However, comparing these results with those from the financial crisis, it is possible to observe one major difference. While the overall regression significance is now slightly higher, the values are still comparable, but the most significant variable is different in the two crises. The FCF per share is highly significant in the financial crisis, while it is not in the sovereign debt one. Instead, the EV is significant at 10% confidence level but with a negative coefficient statistically close to zero. All the other variables are instead comparable between the two periods and are not significant.

Concerning Model 2, instead, the ROE is now the only significant variable. It implies that companies' profitability helps in explaining bidders' returns in this period. However, the variable coefficient is highly close to zero. It is important to mention that in Model 2 is now included also the total debt variable, which was excluded by the same model of the financial crisis for correlativity issues. However, also this variable coefficient is equal to zero and not significant. The main regression results are summarized in the following table:

Table 31 - ARs accounting figures regression results, sovereign debt crisis

The table summarizes the results of regressing bidders' ARs on the independent variables before mentioned. Different studies consider different variables. The values reported are the variables coefficients and VIFs together with the regressions' R^2 and F significance. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively.

	Model 1		Model 2	
R^2	36.17%		31.71%	
F significance	0.3773		0.0696	
	Coefficient	VIF	Coefficient	VIF
EV/EBITDA	0.0008	1.9785	-0.0007	1.2075
FCF SALES	0.0014	1.8223	0.0001	1.2226
FCF PER SHARE	-0.0007	40.2934	0.0001	1.5341
LOG(REV)			-0.0028	1.1185
ROE			0,00038**	1.3281
EV	-2.81E-09*	102.5430		
SALES PER SHARE	-0.0004	37.1878		
EBITDA	3.20E-09	707.0747		
NET DEBT/EBITDA	-0.0031	7.7645		
NET DEBT	-8.51E-09	50.1406		

LONG TERM DEBT	-1.14E-09	166.1245		
INTEREST	-7.42E-08	133.6126		
EXENSES/DEBT				
TOTAL DEBT	1.85E-08	762.0074	-4.16E-10	1.1214
CAPEX	-8.96E-09	662.4878		
D/EV	-0.1281	4.0768	-0.0218	1.7007

Finally, the same charts regarding the size and the industry are presented as in the previous analysis. Starting from the size, it is possible to observe:

Figure 26 - bidders' total assets (€), sovereign debt crisis

The figure reports bidders' Total Assets and Total Revenues. They are two representations of companies' size. Data are available for bidders during the sovereign debt crisis and are presented in euro million.

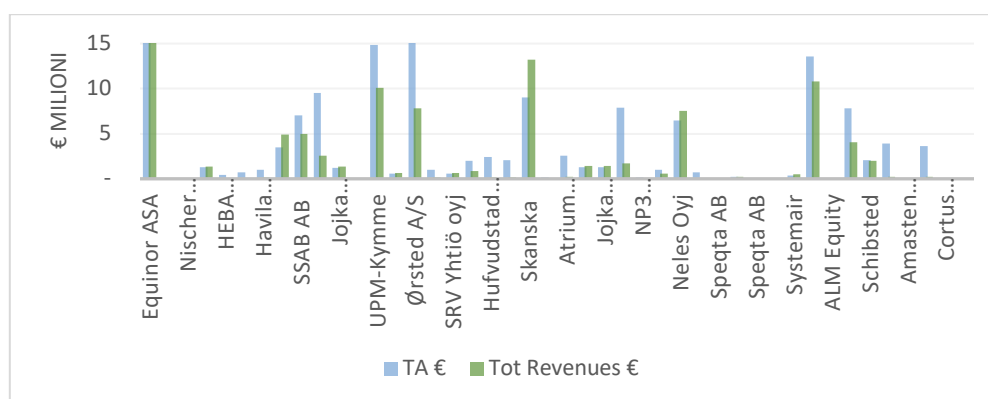
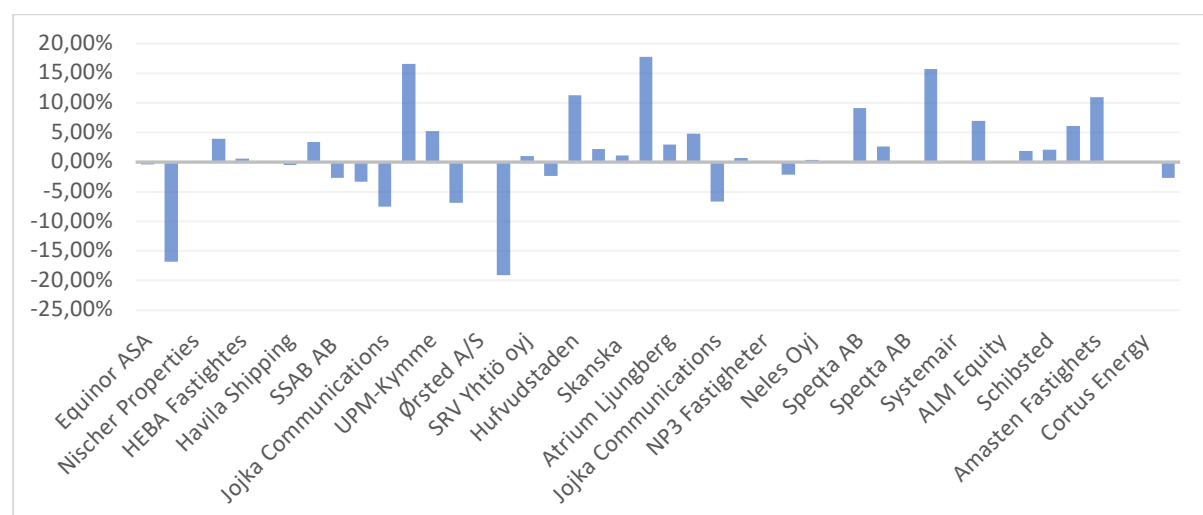


Figure 27 - Bidders' abnormal returns, sovereign debt crisis

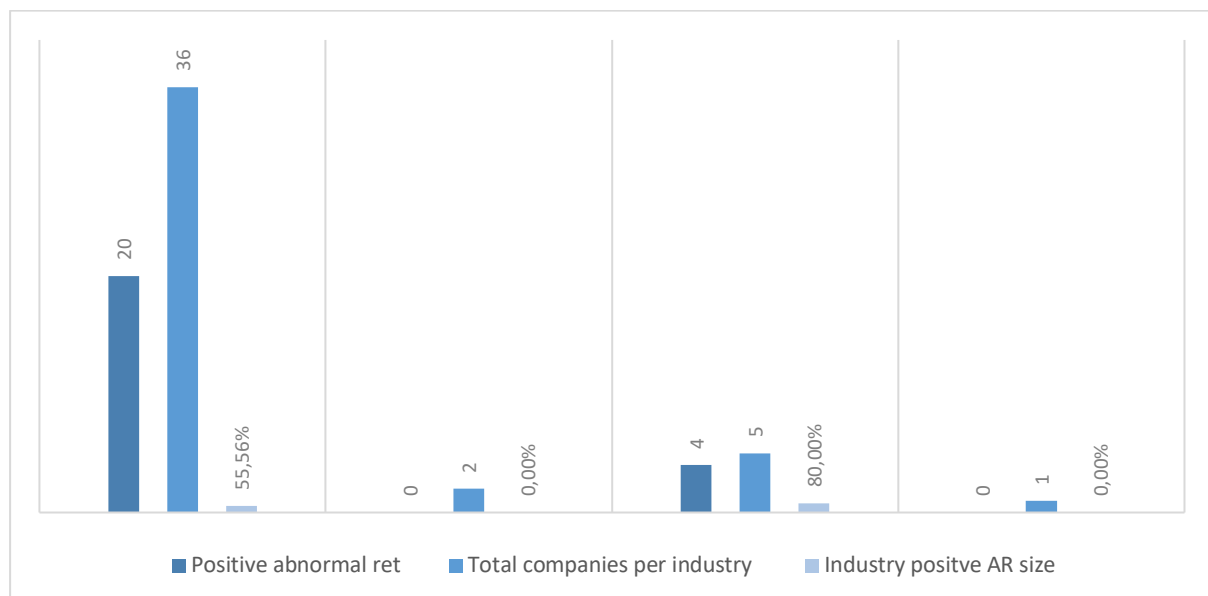
The figure reports bidders' Abnormal during the sovereign debt crisis. Abnormal Returns are computed as the difference between absolute returns and normal returns. The market model has been used as normal return.



As in the financial crisis, the bidders' size does not seem to be related to the abnormal returns, as confirmed by the above regression. Concerning the sector, instead, the size of each industry is similar to the one observed in the financial crisis. The only difference regards financial buyers, which diminished in terms of M&A deals. The industrial sector remains the most active one also in the sovereign debt crisis, and around 55% of these transactions had a positive abnormal return. Differently, none of the companies in the sample that merged in this period registered an AR higher than zero in the transportation and utility industries. Finally, 80% of the deals in the financial industry had a positive abnormal return, but these represent only 11% of the total deals considered in the sample. Moreover, at this point, it must be reminded that based on the study in chapter 4.2.2, these ARs are not statistically significant.

Figure 28 - Abnormal returns by industry, sovereign debt crisis

The figure reports bidders Abnormal Returns in each sector available in the sample. The dark blue column represents the number of positive ARs in an industry over the total transaction number belonging to the same industry. The blue column represents the number of positive ARs in an industry over the total number of transactions belonging to all the industries available. The light blue column represents the industry's size relative to the total number of transactions present in the sample. Data are provided for the sovereign debt crisis.



4.3.3 Combined returns regression analysis

In this paragraph, we test if the independent variables improve their explanatory power when used to regress the whole set of returns, i.e., the financial and sovereign debt

crises bidders' returns combined. We, therefore, proceed on testing only that regression which resulted more significant in the previous tests, which are:

1. Regression on the difference between MSCI Nordic index one month before and one month after the announcement;
2. Regression on the volatility index;
3. Regression on the momentum index, built as the difference between the average MSCI Nordics moving average at six months minus two months. It is considered both at weekly and bi-weekly time interval;
4. Regression on the previous three variables combined;
5. Regression on accounting figures.

In this case, the regressions are first conducted using absolute returns as dependent variables and then retrieved using abnormal returns.

Starting from the first, we observe that the market does not explain the whole set of one-week after absolute returns. Indeed, the MSCI, the Volatility Index, and the momentum variables present low R^2 and insignificant F statistics levels. Moreover, their coefficients are statistically equal to zero and not significant.

By combining these variables, the results do not improve as the maximum R^2 reached is 4%, and all the coefficients remain not significant. Therefore, in line with the previous studies, we can conclude that the market does not contribute to the weekly returns' predictions for M&As bidders during these crises.

Similar results are observed in the case of returns computed one month after the announcement. The only difference regards the 5% significance of the market variable and the 1.42% p-value of its coefficient. However, this beta value is statistically equal to zero (0.000111681) and does not affect the results. Moreover, we observe that the less significant variable is the volatility index with an R^2 equal to zero in one-month returns.

Differently, for the six-month returns, the volatility index explained the higher portion of returns, almost 5%, with an F significance of 2.6%. However, this is still not enough to consider this variable relevant as the coefficient – although significant – is equal to zero. Moreover, all the other variables do not increase their importance.

In general, it is clear that the market fails to predict these returns at any sub-periods but improves its power with time, as previously observed. We conclude, analyzing the accounting figures, where we observe results in line with the previous analysis. The higher level of significance is at six months from the announcement, followed by the weekly returns. The most relevant variables remain the FCF/Sales and FCF per share, while the D/EV seems to lose its prediction power.

In conclusion, it appears clear that the analysis of joint returns does not lead to different results, and – on the contrary – the separated tests on the two different results much better help understand the significance of each variable.

4.3.4 CARs regression analysis

In this last paragraph, the Cumulative Abnormal Returns are regressed on some variables to understand their impact. To allow comparison between absolute, abnormal, and cumulative abnormal returns, the independent variables included are similar to those previously used:

Table 16 - Variables used in CARs regression analysis

The table contains a description and the source of all the independent variables used for regressing the Cumulative Abnormal returns during both the financial and the sovereign debt crisis.

Variable	Description	Source
<i>Total Asset</i>	It represents the company size. It includes total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets. It has been considered in logarithm value.	Eikon - Refinitiv
<i>Total Revenues</i>	It represents the company size and includes gross sales and other operating revenue less discounts, returns, and allowances. It has been considered in logarithm value.	Eikon - Refinitiv
<i>FCF/Sales</i>	It is computed as Funds from Operations / Revenues * 100. Funds from Operations represent the sum of net income and all non-cash charges or credits. If cash flow has not been disclosed in any manner, it is estimated based on net profit before preferred dividends plus depreciation, reserves charges, provision for loan	Eikon - Refinitiv

	losses for banks, and provision for future benefits for insurance companies.	
<i>FCF per share</i>	It represents the cash earnings per share of the company for the 12 months that ended the last calendar quarter of the year for U.S. corporations and the fiscal year for non-U.S. corporations. The numerator used for this calculation is Funds from Operations	Eikon - Refinitiv
<i>ROE</i>	The index is computed as the ratio between Net Income and Common Equity. It represents the company's profitability.	Eikon – Refinitiv
<i>D/E</i>	It represents the company's leverage. It is computed as the ratio between total debt and shareholders' common equity and indicates the percentage of debt capital relative to the shareholders' capital. It has been computed using the logarithm values of the total debt and common equity parameters.	Eikon – Refinitiv
<i>D/TA</i>	It represents the company's leverage and indicates the level of indebtedness of the company. It has been computed using the logarithm values of the total debt and total assets parameters.	Eikon – Refinitiv
<i>EV/EBITDA</i>	It represents the company cash generation power	

The dependent variable is computed as the cumulative abnormal returns average 20 days before and 20 days after the announcement for each company in the sample.

As already done for the previous analyses, first it will be presented the case of the financial crisis followed by the sovereign debt one. Moreover, a Variance Indicator Factor (VIF) is included to understand the level of correlation among the variables. It is necessary as the following regressions have as independent variables accounting figures which may be correlated among them. Moreover, as the samples studied are composed of a low number of variables, this type of error may result inflated.

A VIF value equal to 3 is considered as a benchmark. If the variable's VIF will be higher than this value, this variable is too correlated with the others, and therefore, the OLS regression results are biased. The Variance Indicator Factor is computed as $1/(1-R^2)$, where the R^2 results from regressing each independent variable on the others. The results from this study are reported in the following table:

Table 17 - Independent variables' VIF after deleting correlated variables

The table reports the VIF test results for all the independent variables used in this regression model. The values have been computed based on the formula $1/(1-R^2)$ and are compared with a benchmark of 3. The variables included in the table are those resulting after eliminating the correlated ones.

	<i>Financial Crisis VIF</i>	<i>Sovereign Debt Crisis VIF</i>
<i>EV/EBITDA</i>	1.088	1.946
<i>FCF/SALES</i>	1.290	1.383
<i>FCF PER SHARE</i>	1.046	1.097
<i>LOG (REVENUES)</i>	1.962	2.296
<i>ROE</i>	1.336	2.281
<i>D/E</i>	1.796	2.572

Starting from the financial crisis, the regression of the CARs on all the variables reports an R squared higher than 20% (Model 1). However, the VIF analysis signals that the total assets and total revenues are correlated with others. Total Asset has been deleted from the panel to overcome this issue. Retrieving the regression, the results in terms of explanatory power are similar, but the leverage variables are now correlated with the others. Therefore, also the D/TA ratio is excluded, and the regression of CARs is repeated. Now the set of independent variables is composed of six parameters, precisely: the logarithm of total revenues, FCF/Sales, FCF per share, ROE, D/E (where for both the Debt and the Equity are considered the logarithm values), and EV/EBITDA (Model 2).

The final regression set still explains around 20% of the cumulative abnormal returns based on the R^2 . Moreover, the most significant variable is the FCF/Sales followed by the D/E ratio. This result is in line with the previous analysis on the absolute and abnormal returns where the companies' leverage and free cash flow generation power acted as the most significant variables. On the contrary, the size and profitability of the companies are not relevant in explaining the cumulative abnormal returns.

Regarding the size, as observed for the abnormal return, it is not significant. The p-values are higher than 5%, and their coefficients are statistically equal to zero. Moreover, by regressing these variables alone on the CAR, the R^2 is close to zero (Model 3). A similar conclusion can be made for the profitability index (ROE). The regression of CARs on this variable singularly yields to an R^2 lower than 2% and a non-significant coefficient (Model 4).

Differently, regressing the CARs on the FCF variables only, the R squared is around 8%, and the p-value of the coefficient FCF/Sales is lower than 5% proving the significance of the ratio. However, the same regression done using the leverage ratio as an independent variable is not significant, confirming that this variable helps explain bidders' returns only if considered with other parameters (Model 6).

Table 18 - CARs regression results (financial crisis)

The table summarizes the results of regressing bidders' CARs on the independent variables before mentioned. Different studies consider different variables. The values reported are the coefficients of the variables. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>R square</i>	21.17%	19.16%	1.81%	2.30%	7.85%	4.17%
<i>F significance</i>	14.64%	8.69%	61.03%	26.01%	10.99%	31.65%
<i>EV/EBITDA</i>	1.58E-04	3.32E-05				
<i>FCF SALES</i>	2.10E-05***	2.40E-05***			1.60E-05**	
<i>FCF PER SHARE</i>	1.84E-04	4.29E-05			2.57E-05	
<i>LOG(REV)</i>	-2.40E-09	0.009	-4.94E-10			
<i>ROE</i>	-0.126	-0.153		-0.128		
<i>D/E</i>	-0.055	-0.224**				-0.045
<i>D/TA</i>	-0.059					0.058
<i>Log(TA)</i>	2.39E-09		2.89E-10			

Finally, the same study is proposed for the sovereign debt crisis. Starting from the broader set of variables (Model 1) and studying the VIF coefficients, the results are similar to those observed from 2008 – 2010. Therefore, the final set of variables used is the same as the previous and includes log(Total Revenues), FCF/Sales, FCF per share, ROE, D/E (logarithm terms), and EV/EBITDA.

Reducing the number of variables, the results of the VIF test improve; however, the VIF index values are, on average, slightly higher than the ones of the financial crisis. It

can be explained by the lower number of observations available for the period 2011 – 2012 compared to the other. However, all the values are lower than the threshold (3), and therefore the regression can be considered acceptable.

The R^2 of the regression excluding correlated variables is 22%, but none of the variables considered results significant (Model 2). While the profitability and the size did not impact the cumulative returns also in the financial crisis, this was not the case for the other variables. Specifically, the FCF/Sales, which resulted in the best explanatory variable in the previous test, now has a p-value of 70%, while the FCF per share of 16%, and the leverage ratio of 21%. Moreover, regressing the CARs on the FCF/Sales only, the results do not improve, and the variable is confirmed not significant (Model 5). On the contrary, the regression on the leverage variable singularly yields an R^2 of 11%, and the coefficient p-value is around 4% (Model 6)

Table 19 – CARs regression results (sovereign debt crisis)

The table summarizes the results of regressing bidders' CARs on the independent variables before mentioned. Different studies consider different variables. The values reported are the coefficients of the variables. The symbols ***, **, * indicate significance at the 1%, 5% and 10% level, respectively.

<i>Variable</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>R square</i>	14.51%	22.75%	2.71%	1.17%	6.42%	11.32%
<i>F significance</i>	79.06%	23.96%	63.57%	53.08%	33.45%	4.48%
<i>EV/EBITDA</i>	-6.2E-05	8.5E-04				
<i>FCF SALES</i>	1.4E-04	-1.9E-04			-2.9E-04	
<i>FCF PER SHARE</i>	8.9E-08	7.9E-08			7.9E-08	
<i>LOG(REV)</i>	4.8E-10	-1.6E-02	5.9E-10			
<i>ROE</i>	-3.2E-03	-5.9E-04		-1.4E-02		
<i>D/E</i>	4.0E-02	-3.5E-02				-0.0564**
<i>D/TA</i>	-1.8E-01					
<i>Log(TA)</i>	-4.3E-10		-5.2E-10			

5. Conclusions

The study starts by analyzing the current literature and focalizes on two relevant points. Firstly, it assesses how to measure the profitability of M&A players. Secondly, it studies the common elements of these transactions. We concluded that – on averages – M&As are not convenient for bidders, especially in the short term if we measure their performance in terms of stock returns. Indeed, it was clear that due to the high premia that buyers usually pay to the sellers and the difficulty of incorporating the synergies' benefits in the performance assessment, their stock returns are often negatively affected.

Despite several studies that have been carried out on the topic, the most shared conclusion is that bidders do not gain from these transactions. For this reason, the purpose of this thesis was to investigate if, during crisis periods, these results can be – at least partially – confuted in the Nordic market.

We started with the idea that bidders can achieve better deals during crises thanks to spotting undervalued targets. Indeed, the general economic distress and the related uncertainty for the future may negatively impact the sellers' valuations, incentivizing bidders to conclude the acquisition and reducing the premium they are usually required to pay. Together with the expectations of economic recovery after the acquisition, these elements may have impacted buyers' stock prices, improving their negative returns.

To complete the analysis, we selected the less studied Nordic market, and we investigated its peculiarities. Moreover, we decided to focus on the financial (2008-2010) and the sovereign debt (2011-2012) crises that are close in timing but differently affected the Nordic market. It allowed us to achieve different and more comprehensive results.

The study was mainly focused on three different tests related among them. Firstly, it analyzes the number of transactions in the last 15 years. The broad time range has been selected to spot any eventual trend typical of crisis periods. The analysis allowed us to understand that during market distress, the number of M&As usually declined,

depending on the severity of the crisis's impact. However, at the same time, the overall value transacted increases during the same periods. It was crucial information that allowed us to proceed with the analysis as it suggests that if the bidders want to invest more, they can expect better results.

The second test studies the bidders' profitability measured in terms of stock returns. To do so, we created a sample including all the transactions announced by public companies with targets and bidders based in the Nordics during the two crises mentioned. We first studied their absolute returns observing that, on average, 50% of them had a positive return despite the crisis period, and around 2/3 of the bidders registered a positive or slightly negative (less than one percent) return. The results are quite similar between the two periods selected. This result is a positive signal for bidders' profitability as it proves that some of them could register a positive stock return.

However, to verify if the M&A had a positive impact on the bidders' profitability, it is necessary to check if these returns were better than those that could have been expected. In other words, we compared the buyers' returns with those computed using the Capital Asset Pricing Model. We obtained similar results in terms of companies' numbers that could beat the CAPM during crises. Nevertheless, studying their statistical significance resulted that the null hypothesis that abnormal returns are different from zero can never be refused. By studying the cumulative abnormal returns, the same conclusion has been reached for the sovereign debt crisis. Instead, the CARs for the financial crisis are slightly positive and significant.

In conclusion, combining the results from the two previous studies, bidders in the Nordic market still not register positive and significant abnormal returns. However, one other aspect is apparent. The severity of the crisis impacts the bidders' performance; the higher it is, the better their profitability. It is confirmed by the better results, in terms of absolute returns, ARs and CARs observed in the financial crisis compared to the sovereign debt one. Moreover, the positive and statistically significant CARs during the financial crisis can be read as a signal that bidders' profitability may increase during bad market conditions. However, as the number of observations and the statistical significance is low, it should be considered only as of the first step on a broader

analysis which may involve – in the future – also the impact of the Covid-19 pandemic crisis.

The last and third test has been a series of regression analyses on bidders' returns computed at different time intervals. As independent variables, we used some indicators of the market trend to understand if the market explained the bidders' performance; and some accounting statistics to – instead – observe if it was attributable to intrinsic characteristics of the firms. Instead, as a dependent variable, we used the absolute, the abnormal, and the cumulative abnormal returns to verify if different results can be concluded in one respect to the other. We did not observe significant differences between absolute and abnormal returns, but we instead observed different results between the two crises. Indeed, while the market completely fails in predicting the financial crisis bidders' returns, it is more significant for the sovereign debt one. Hence, the power with which the crisis hit the Nordic market is related to the portion of bidders' returns explained by the market.

Instead, a typical behavior is observable in accounting figures, which always explains a high portion of the returns, especially one week and six months after the announcement. Both the ARs and the CARs are mainly explained by the variables representing the bidders' leverage and cash flow generation power. On the contrary, the size, the profitability, and the sector are not relevant variables in determining bidders' abnormal returns during 2008 – 2012.

In conclusion, it is unclear if and how the Nordic M&A's bidders benefited from investing during crises. While there are positive stock returns, the abnormal returns are not statistically significant. However, the higher the impact of the crisis on the economy, the bigger the stocks return advantages. It is an initial, but interesting, result which sets the basis for further studies on the topic.

6. Appendix

Figure 3, Attachment 1 – Summary of regression results: Financial crisis, absolute returns

The figure summarizes the results of regressing the absolute returns on different market variables. As dependent variables have been used absolute returns five days, one month and six months after the M&A announcement. As regressors are used the market, volatility and momentum indexes singularly and combined among them. For all the regressions are reported the R^2 and F significance together with the coefficient values and their p-values. The analysis refers to the financial crisis.

	5 DAYS ABSOLUTE RETURNS				1 MONTH ABSOLUTE RETURNS				6 MONTHS ABSOLUTE RETURNS			
	R square	F significance	Variable 1 coefficient	Variable 2 coefficient	R square	F significance	Variable 1 coefficient	Variable 2 coefficient	R square	F significance	Variable 1 coefficient	Variable 2 coefficient
MSCI Difference	0.006%	0.91726917	-1.6758E-06 0.85773697	0.00115933 0.69403145	5.767%	0.09403145	0.00115933 0.69403145	0.00115933 0.69403145	0.191%	0.74406428	4.7867E-05 0.74406428	4.7867E-05 0.74406428
Volatility	0.146%	0.77577657	4.3057E-05 0.77577657	0.0002% 0.823876767	0.060%	0.823876767	-7.8630E-05 0.823876767	-7.8630E-05 0.823876767	7.513%	0.03732313	-0.05163713 0.03732313	-0.05163713 0.03732313
Mom. Week (1-6)	0.0753%	0.83801244	0.3463873 0.83801244	1.481%	0.386067724	3.554386757 0.86067724	3.554386757 0.86067724	3.554386757 0.86067724	1.1263%	0.427850566	-7.11380492 0.427850566	-7.11380492 0.427850566
Mom. Week (2-6)	5.851%	0.097347332	-2.654252739 0.097347332	0.432%	0.623963096	-1.686976191 0.623963096	-1.686976191 0.623963096	-1.686976191 0.623963096	0.0891%	0.823398352	1.738234287 0.823398352	1.738234287 0.823398352
Mom. BI - Week (1-6)	0.0293%	0.898561903	-0.31703153 0.898561903	0.029%	0.898561903	-0.31703153 0.898561903	-0.31703153 0.898561903	-0.31703153 0.898561903	0.0795%	0.833562195	2.781222777 0.833562195	2.781222777 0.833562195
Mom. BI - Week (2-6)	2.069%	0.277782131	-2.918326573 0.277782131	0.006%	0.822535984	1.417639689 0.822535984	1.417639689 0.822535984	1.417639689 0.822535984	0.6529%	0.546524644	8.637197795 0.546524644	8.637197795 0.546524644
MSCI & Volatility	0.1485%	0.959595624	-1.01922E-06 0.959595624	5.776%	0.181776596	0.00115458 0.181776596	0.00115458 0.181776596	0.00115458 0.181776596	7.557%	2.24806279	2.28493E-05 0.73747051	2.28493E-05 0.73747051
MSCI & Mom. Week (1-6)	0.061%	0.973863353	-3.05346E-06 0.973863353	6.253%	0.189337011	0.000103344 0.99587028	0.000103344 0.99587028	0.000103344 0.99587028	1.594%	0.642393885	7.8918E-05 0.610271624	7.8918E-05 0.610271624
MSCI & Mom. Week (2-6)	5.954%	0.184355695	-4.68855E-06 0.184355695	5.945%	0.185328649	0.000113831 0.7780984	0.000113831 0.7780984	0.000113831 0.7780984	0.3098%	0.918208798	5.1889E-05 0.78448174	5.1889E-05 0.78448174
MSCI & Mom. BI - Week (1-6)	0.0294%	0.991945855	2.74342E-07 0.991945855	6.018%	0.181776596	0.000100621 0.181776596	0.000100621 0.181776596	0.000100621 0.181776596	0.1953%	0.94765988	4.39953E-05 0.897557075	4.39953E-05 0.897557075
MSCI & Mom. BI - Week (2-6)	2.213%	0.540297688	7.2542E-06 0.540297688	5.918%	0.186906691	0.000121283 0.707057538	0.000121283 0.707057538	0.000121283 0.707057538	0.7017%	0.823952488	2.5179E-05 0.87072698	2.5179E-05 0.87072698
Volatility & Mom. Week (1-6)	0.206%	0.94389215	4.1337E-05 0.94389215	1.559%	0.644275137	-0.75195E-05 0.7816971	-0.75195E-05 0.7816971	-0.75195E-05 0.7816971	8.327%	0.091532827	-0.05163713 0.46235023	-0.05163713 0.46235023
Volatility & Mom. Week (2-6)	5.901%	0.183463419	4.04137E-05 0.183463419	0.525%	0.865214791	-4.02576E-05 0.87154638	-4.02576E-05 0.87154638	-4.02576E-05 0.87154638	7.580%	0.114163755	-0.001635562 0.897186243	-0.001635562 0.897186243
Volatility & Mom. BI - Week (1-6)	0.198%	0.946483679	4.7014E-05 0.946483679	3.183%	0.410735744	-0.000149734 0.734190452	-0.000149734 0.734190452	-0.000149734 0.734190452	8.0130%	0.104572991	7.049387612 0.03717802	7.049387612 0.03717802
Volatility & Mom. BI - Week (2-6)	2.337%	0.52186459	5.4848E-05 0.52186459	0.193%	0.948591743	-8.48987E-05 0.7230564	-8.48987E-05 0.7230564	-8.48987E-05 0.7230564	8.527%	0.082624359	-0.001635562 0.83973724	-0.001635562 0.83973724
MSCI & Vol. & Mom. Week (1-6)	0.2215%	0.989221824	-2.3040E-06 0.989221824	6.278%	0.316566496	0.00010759 0.1686638	0.00010759 0.1686638	0.00010759 0.1686638	8.504%	0.18840169	4.74219E-05 0.74782384	4.74219E-05 0.74782384
MSCI & Vol. & Mom. Week (2-6)	1.077%	0.930351419	-1.5856E-06 0.930351419	6.381%	0.308814767	0.000114353 0.757214E-05	0.000114353 0.757214E-05	0.000114353 0.757214E-05	7.607%	0.229714779	2.21258E-05 0.87623618	2.21258E-05 0.87623618
MSCI & Vol. & Mom. BI - Week (1-6)	0.2087%	0.99012459	2.3419E-06 0.99012459	6.050%	0.333152912	9.84335E-05 0.84073141	9.84335E-05 0.84073141	9.84335E-05 0.84073141	8.060%	0.205304374	-2.87293E-05 0.86783774	-2.87293E-05 0.86783774
MSCI & Vol. & Mom. BI - Week (2-6)	2.4914%	0.711425055	8.49398E-06 0.711425055	5.919%	0.344126701	0.00012096 0.97402113	0.00012096 0.97402113	0.00012096 0.97402113	8.534%	0.182251709	-0.7606E-06 0.86116202	-0.7606E-06 0.86116202

Figure 5, Attachment 2 – Summary of regression results: Financial crisis, abnormal returns

The figure summarizes the results of regressing the abnormal returns on different market variables. As dependent variables have been used abnormal returns five days, one month and six months after the M&A announcement. As regressors are used the market, volatility and momentum indexes singularly and combined among them. For all the regressions are reported the R^2 and F significance together with the coefficient values and their p-values. The analysis refers to the financial crisis.

FINANCIAL CRISIS ABNORMAL RETURNS									
5 DAYS ABNORMAL RETURNS					1 MONTH ABNORMAL RETURNS				
R-squared	F-significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient	R-squared	F-significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient
0.005%	0.95082732	-1.5909E-06	0.00016271	0.00881933	0.184%	0.74244994	4.7807E-05	0.00163498	0.00163498
0.143%	0.95082732	4.2629E-05	-8.0305E-05	0.00881933	7.743%	0.03442999	-0.01164269	0.00163498	0.00163498
0.177%	0.95082732	0.17745322	0.82021323	0.00881933	1.051%	0.442273648	6.62557295	0.00163498	0.00163498
0.0796%	0.837603284	-0.347110722	-3.58796472	0.387719382	0.084%	0.80016688	-1.88984272	0.00163498	0.00163498
5.852%	0.00731729	2.65263532	1.89181943	0.62325575	0.084%	82.8483%	-283.34455	0.00163498	0.00163498
0.020%	0.88655793	0.37794381	-7.35875406	0.38405228	0.084%	0.90069795	-8.25763765	0.00163498	0.00163498
2.108%	0.27684834	2.32480266	-1.38714693	0.826385127	7.797%	0.10780529	2.2554E-05	0.00163498	0.00163498
0.145%	0.9098E-07	9.0908E-07	0.00015953	0.19281761	1.922%	0.05840769	7.8632E-05	0.00163498	0.00163498
0.0949%	0.974224895	-0.38644041	0.00010976	0.16762284	0.334%	0.91181203	5.1837E-05	0.00163498	0.00163498
5.852%	0.916323601	0.916323601	0.00010976	0.16762284	0.180%	0.94672513	4.3502E-05	0.00163498	0.00163498
0.020%	0.916323601	0.916323601	0.00010976	0.16762284	0.062%	0.83287796	2.8107E-05	0.00163498	0.00163498
0.207%	0.83446106	0.83446106	0.00010976	0.16762284	8.485%	0.0872263	-0.0115724	0.00163498	0.00163498
5.979%	0.163328	0.163328	0.00010976	0.16762284	7.856%	0.10634518	-0.0115724	0.00163498	0.00163498
0.189%	0.84723516	0.84723516	0.00010976	0.16762284	8.862%	0.03256919	-0.0115724	0.00163498	0.00163498
2.342%	0.921147468	0.921147468	0.00010976	0.16762284	8.700%	0.08183973	-0.0115724	0.00163498	0.00163498
0.216%	0.984657095	0.984657095	0.00010976	0.16762284	0.864%	0.17632689	4.8603E-05	0.00163498	0.00163498
6.081%	0.33288943	0.33288943	0.00010976	0.16762284	7.862%	0.21453897	2.8107E-05	0.00163498	0.00163498
0.207%	0.98242466	0.98242466	0.00010976	0.16762284	8.175%	0.18267858	-2.8698E-05	0.00163498	0.00163498
2.501%	0.710101339	0.710101339	0.00010976	0.16762284	8.714%	0.17434475	-0.0115724	0.00163498	0.00163498
					0.7038846		0.85217733		

Figure 6, Attachment 3 – Summary of regression results: Sovereign debt crisis, absolute returns

The figure summarizes the results of regressing the absolute returns on different market variables. As dependent variables have been used absolute returns five days, one month and six months after the M&A announcement. As regressors are used the market, volatility and momentum indexes singularly and combined among them. For all the regressions are reported the R² and F significance together with the coefficient values and their p-values. The analysis refers to the sovereign debt crisis.

	5 DAYS ABSOLUTE RETURNS					1 MONTH ABSOLUTE RETURNS					6 MONTHS ABSOLUTE RETURNS				
	R square	F significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient	R square	F significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient	R square	F significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient
MSCI Difference	12.15%	0.02198063	5.7511E-05	0.00188963	0.07684801	7.48%	0.07684801	9.9792E-05	0.07684801	0.29737746	2.65%	0.29737746	9.7092E-05	0.29737746	0.00213381
Volatility	17.50%	0.00524579	0.0002821	0.00524579	0.38216620	2.03%	0.38216620	0.00019745	0.38216620	0.5069293	1.08%	0.5069293	0.000235917	0.5069293	0.00789917
Non. Week (1-4)	0.85%	0.556868054	-1.00567719	0.00000004	0.413294071	1.64%	0.413294071	3.983722617	0.413294071	0.836190903	0.11%	0.836190903	1.279689453	0.836190903	0.000157445
Non. Week (2-6)	1.79%	0.391944789	0.94027759	0.391944789	0.340114239	2.22%	0.340114239	2.315131275	0.340114239	0.216000036	3.72%	0.216000036	4.901944137	0.216000036	5.10915672
Non. BI - Week (1-4)	3.72%	0.391944789	0.94027759	0.391944789	0.030111386	10.86%	0.030111386	8.024153149	0.030111386	0.175290228	4.43%	0.175290228	9.262683159	0.175290228	0.20442736
Non. BI - Week (2-6)	3.95%	0.20134089	1.918671915	0.20134089	0.176003548	4.42%	0.176003548	4.48925802	0.176003548	0.150921628	4.97%	0.150921628	7.71912725	0.150921628	7.44109589
MSCI & Volatility	20.96%	0.00058552	3.40427E-05	0.000205228	0.208104767	7.55%	0.208104767	9.59023E-05	0.208104767	0.568285985	2.79%	0.568285985	8.63775E-05	0.568285985	0.007213861
MSCI & Mom. Week (1-4)	14.90%	0.039127742	6.31275E-05	-1.842000819	0.187415826	8.03%	0.187415826	9.42034E-05	0.187415826	0.98491449	2.65%	0.98491449	9.71233E-05	0.98491449	0.000157445
MSCI & Mom. Week (2-6)	13.96%	0.048420605	5.75941E-05	0.945016842	0.12855418	9.71%	0.12855418	9.98989E-05	0.12855418	0.267429554	6.38%	0.267429554	9.73157E-05	0.267429554	0.000157445
MSCI & Mom. BI - Week (1-4)	12.40%	0.059424077	5.3213E-05	0.771845153	0.057331582	13.32%	0.057331582	6.1837E-05	0.057331582	0.346350153	5.16%	0.346350153	5.6417E-05	0.346350153	0.000157445
MSCI & Mom. BI - Week (2-6)	13.92%	0.049534652	5.31255E-05	1.365353045	0.120893731	10.03%	0.120893731	8.9124E-05	0.120893731	0.264333629	6.41%	0.264333629	7.3627E-05	0.264333629	0.000157445
Volatility & Mom. Week (1-4)	18.54%	0.016539082	0.000265849	-1.114315615	0.482728978	3.95%	0.482728978	0.000193269	0.482728978	0.789795746	1.17%	0.789795746	0.00024275	0.789795746	0.000157445
Volatility & Mom. Week (2-6)	20.83%	0.008349674	0.000275202	1.291015586	0.3742119	4.80%	0.3742119	0.000223536	0.3742119	0.334185738	5.33%	0.334185738	0.000289411	0.334185738	0.000157445
Volatility & Mom. BI - Week (1-4)	18.02%	0.01471211	0.00024872	1.525986552	0.082690597	11.72%	0.082690597	0.000122749	0.082690597	0.36514727	4.91%	0.36514727	0.000159135	0.36514727	0.000157445
Volatility & Mom. BI - Week (2-6)	20.32%	0.010646736	0.00025409	1.629852516	0.287954554	6.03%	0.287954554	0.000179545	0.287954554	0.306985372	5.73%	0.306985372	0.000190264	0.306985372	0.000157445
MSCI & Vol. & Mom. Week (1-4)	23.06%	0.015805249	3.97857E-05	0.00018905	0.34092468	8.14%	0.34092468	8.8369E-05	0.34092468	0.773168081	2.79%	0.773168081	8.6532E-05	0.773168081	0.000157445
MSCI & Vol. & Mom. Week (2-6)	23.96%	0.01783833	3.23713E-05	0.00021405	0.247979033	9.93%	0.247979033	9.71897E-05	0.247979033	0.42874483	6.77%	0.42874483	7.9407E-05	0.42874483	0.000157445
MSCI & Vol. & Mom. BI - Week (1-4)	21.31%	0.0231747564	2.9757E-05	0.000206362	0.128274297	13.40%	0.128274297	5.6329E-05	0.128274297	0.54110594	5.31%	0.54110594	4.4751E-05	0.54110594	0.000157445
MSCI & Vol. & Mom. BI - Week (2-6)	22.82%	0.016739553	2.94172E-05	0.000207306	0.238849415	10.11%	0.238849415	8.30733E-05	0.238849415	0.441265873	6.89%	0.441265873	6.2423E-05	0.441265873	0.000157445

Figure 7, Attachment 4 – Summary of regression results: Sovereign debt crisis, abnormal returns

The figure summarizes the results of regressing the abnormal returns on different market variables. As dependent variables have been used abnormal returns five days, one month and six months after the M&A announcement. As regressors are used the market, volatility and momentum indexes singularly and combined among them. For all the regressions are reported the R^2 and F significance together with the coefficient values and their p-values. The analysis refers to the sovereign debt crisis.

	R square	5 DAYS ABNORMAL RETURNS				1 MONTH ABNORMAL RETURNS				6 MONTHS ABNORMAL RETURNS			
		Significance		Variable 1 coefficient		Variable 2 coefficient		Variable 3 coefficient		Significance		Variable 2 coefficient	
		F	p-value	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient	F	p-value	Variable 2 coefficient	Variable 3 coefficient
MSCI Difference	12.19%			0.021761872	5.75111E-05		0.00732441	9.4428E-05		0.261347968	0.00105097		
Volatility	17.52%				0.021761872		0.00732441	0.00184457			0.00251486		
Mem Week (1-6)	0.82%			0.005221039	0.0026278		0.00732441	0.00184457		0.481054433	0.00251486		
Mem Week (2-6)	1.76%			0.36473568	0.00184457		0.00732441	0.00184457		0.745877204	0.00251486		
Mem B1-Week (1-6)	3.75%			0.36473568	0.00184457		0.00732441	0.00184457		0.246571765	0.00251486		
Mem B1-Week (2-6)	3.97%			0.213622852	0.00184457		0.00732441	0.00184457		0.15786008	0.00251486		
MSCI & Volatility	21.00%			0.008972545	3.4199E-05		0.00732441	0.00184457		0.146280056	0.00251486		
MSCI & Mem Week (1-6)	14.88%			0.029835129	0.00184457		0.00732441	0.00184457		0.520217191	0.00251486		
MSCI & Mem Week (2-6)	13.96%			0.049380761	0.00184457		0.00732441	0.00184457		0.533544634	0.00251486		
MSCI & Mem B1-Week (1-6)	12.53%			0.088738068	0.00184457		0.00732441	0.00184457		0.268861597	0.00251486		
MSCI & Mem B1-Week (2-6)	13.97%			0.049380761	0.00184457		0.00732441	0.00184457		0.30841386	0.00251486		
Volatility & Mem Week (1-6)	18.53%			0.01588779	0.00184457		0.00732441	0.00184457		0.74653219	0.00251486		
Volatility & Mem Week (2-6)	20.81%			0.029417421	0.00184457		0.00732441	0.00184457		0.358742187	0.00251486		
Volatility & Mem B1-Week (1-6)	18.05%			0.014585844	0.00184457		0.00732441	0.00184457		0.332710334	0.00251486		
Volatility & Mem B1-Week (2-6)	20.36%			0.01588779	0.00184457		0.00732441	0.00184457		0.268861597	0.00251486		
MSCI & Vol & Mem Week (1-6)	23.05%			0.01588779	0.00184457		0.00732441	0.00184457		0.77798846	0.00251486		
MSCI & Vol & Mem Week (2-6)	23.95%			0.012810606	0.00184457		0.00732441	0.00184457		0.432446409	0.00251486		
MSCI & Vol & Mem B1-Week (1-6)	21.35%			0.02351346	0.00184457		0.00732441	0.00184457		0.486147364	0.00251486		
MSCI & Vol & B1-Week (2-6)	22.87%			0.014585844	0.00184457		0.00732441	0.00184457		0.410861404	0.00251486		

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Analysis and comparison of M&A bidders' profitability in the Italian market

Mirko Battini

Master of Science Thesis, Part 2

Stockholm School of Economics

2021



Abstract:

The financial and the sovereign debt crises environment may have impacted the M&A bidders' profitability. This study aims to investigate if buyers Absolute and Abnormal Returns improved during distressed market periods. The study is based on the Italian market and it will be compared with the Nordic one.

The research starts by discussing the characteristics of the less developed, in terms of M&A, Italian market to follow with an analysis of the M&A trends and bidders' profitability during crisis periods. Buyers' performances are assessed using both absolute and abnormal returns. The test is concluded by investigating the determinants of these returns through a regression analysis which includes, as predictors, both market and company specific variables.

Final results are not different from those observed in the Nordic market. However, the combined evidence proves the importance of the crisis impact in the determining the bidders' profitability. Moreover, differently from the Nordics, in Italy the market variables always explain a portion of bidders' returns probably due to the lower development of Italian M&A market.

Keywords:

M&A, bidders' profitability, crisis, Italy

Author:

Mirko Battini

Tutor:

Dong Yan, Assistant Professor, Department of Finance, SSE

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Summary

This thesis aims to verify if M&A buyers benefited from this transaction in terms of stock returns. Much literature supports the opposite argument according to which M&A bidders on average register a negative performance. Therefore, it is intended to test if this is not true in a particular situation, such as an economic crisis. Specifically, it will be tested the financial crisis (2008 – 2010) and the sovereign debt crisis (2011 – 2012) in Italy.

The study starts by analyzing the Italian M&A market in the last year with a specific comparison of its characteristics to the Nordic ones. This study, indeed, is part of a broader research conducted on the Nordic market and has the specific goal to compare the result obtained in that study with those observables in the Italian market. The nature of this comparison lies on the peculiarities of these two countries. These are two European markets different between them for historical reasons, entrepreneurs' behavior and businesses' characteristics. Therefore, the analysis aims to find the differences among them and study how these differences can have impacted the bidders' performance during crises.

The study will firstly investigate the typical market behavior during the crisis periods, to proceed with a more detailed return analysis focused on bidders' absolute and abnormal returns. The analysis will be developed using a series of regression models which combine market and accounting variables. In the end, we aim to obtain a clear picture of how announcing an M&A transaction during a crisis can affect the bidders' performance.

Chapter 1: Italian M&A market

The objective of the thesis is to determine if the results found for the Nordic market are valid also in the Italian one. Specifically, it will be tested if, during distressing periods, M&As returns are higher than those registered in other periods, especially for the bidder.

In this first chapter, the Italian market of merger and acquisition will be examined to explain the reason behind the comparison. It is indeed based on both sources of similarities between the two markets and sources of differences. Specifically, Italy has been chosen as a member of the European zone – like Sweden – but presents some aspects of peculiarities that may justify different results.

For instance, as members of the European Union, both countries have to respect the same anti-concentration law. It started back with the first agreement – the *Rome treaty* – in 1959, and it developed during the years until reaching the current legislative shape. The European law is committed to ensuring a safe, competitive environment for all its players and therefore checks – often after the deal is concluded – if the merger or acquisition between two businesses may negatively impact the EU's competitiveness. However, many differences are present and will be discussed in the following paragraphs.

History of the Italian M&A market

A critical aspect of the M&As market is that companies and banks can learn from the past. The evidence seems to prove that mergers done in recent years have been influenced by previous events and by the experience acquired in previous transactions. It implies that it is possible to increase the profitability of a merger by learning from previous mistakes or copying already successful strategies.

This finding is essential for our analysis as it supports the idea that as older a market is – in the M&As context – as more information it has acquired and more successful the deals are likely to be in the future. For this reason, it is crucial to understand the history of the Italian market and compare it with the Sweden one.

The merger phenomena are relatively old, and in history, we can count many waves of M&As. According to the literature, the first one was between 1895 and 1904 in the US. It resulted from the increasing industrialization and the rapid spread of the means of transport which allowed companies and materials to reach quickly and efficiently opposite sides of the country. The increase of the merger activities received the state reply with the approval Sherman Antitrust Act (1890).

After that, at least four other waves occurred in the US market, starting after the second world war and with different characteristics according to the period. However, really few deals have been concluded in Italy until the end of the 20th century. The so-called *fifth wave* in the US and global market between 1992 and 2000 was the first when significant transactions were carried out in Italy.

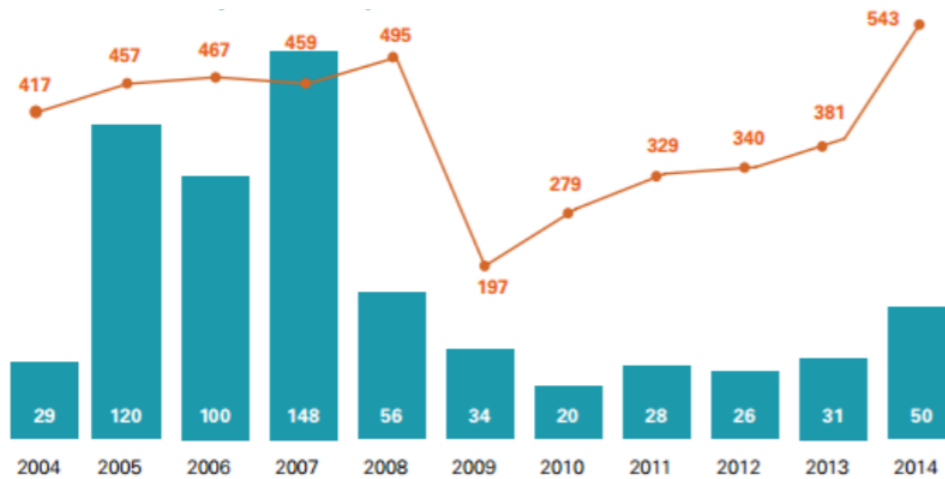
The rationality behind this wave was the will to consolidate economic position and expand in new countries. European M&As activities increased in response to globalization and the increase of the European legislation in favor of a more unified region. As a consequence of the high number of deals concluded, this period has been called *Megamergers*.

Likewise, in Italy, big transactions have been signed, such as the acquisition of Telecom – an Italian company responsible for phone communications – by Olivetti. Additionally, the first big financial deal has been finalized with Banca Intesa – nowadays again at the center of the Italian M&A market with the merger with UBI Banca – acquiring Banca Commerciale Italiana. Other transactions similar to these have also been concluded, facilitated by the *privatization* period, which involved selling many government-owned entities to the public market. During the end of the previous century, many Italian companies became private by merging with others or by a public share offer.

Despite that, the Italian merger market is still defined as immature, fragmented, and relatively not transparent. However, only in the period between 1999 and 2011, M&As operations started to increase, reaching a peak in 2008. The graph below shows the number of transactions concluded in Italy between 2004 and 2014.

Figure 4 - M&A transaction figures in Italy

The graph reports the number of M&A transactions concluded in Italy between 2004 and 2014. The green bars represent the value of the transactions (in billions of euros), while the orange line represents the number of deals concluded in each year



The green bars indicate the value of the transactions (in billions of euros), while the orange line represents the number of deals concluded in each year.

The clearest information is that the overall market value in Italy decreased after the financial crisis, while the number of deals increased after the collapse post-financial crisis. It happens because, in distressed periods, M&As are riskier as more uncertainty is present both in the market and in the company's future outlooks. The evidence proves that – historically – during these periods, big companies buy small ones, as the former has the liquidity and capacity to afford the deal during crisis periods, together with the possibility of eventually supporting the losses in the future years. The result is that there are more deals of lower amount.

In Italy, however, due to the market characteristics, there are not many big companies – compared to other states – which can afford this type of transaction. On the contrary, we have several small companies which can be the target of such deals.

The result is that – especially after the financial crisis – Italy M&As market has grown mainly in numbers of sellers, with many potential buyers coming from abroad.

In conclusion, the Italian market grew mainly during the ten-year pre-crisis, but less than the global market. A study by KMPG reports that between 1998 and 2005, the

whole market grew at a CAGR of 7.3%, representing 4.3% of the global GDP. However, the Italian market grew only by 6.2% (3.3% of the Italian GDP). It

It implies first that the Italian M&As market grew less than the global market and that in terms of percentage of the reference GDP, it represented a lower share. This last information might be interpreted as a signal of underdevelopment of the market itself.

Therefore, not only Italy started with a delay compared to other European markets, but it also grew less than the overall M&As market, not filling in the gap. On the contrary, a different scenario occurred in Cina, for example. Despite it started with a delay compared to the EU and American market – exactly as Italy did - it was able to recover fast during 2014 – 2018. Indeed, while the Chinese market grew significantly, outperforming the global market, Italy reduced its relative position, as shown by the following comparison.

Table 20 - Comparison between Italian and Chines market growth

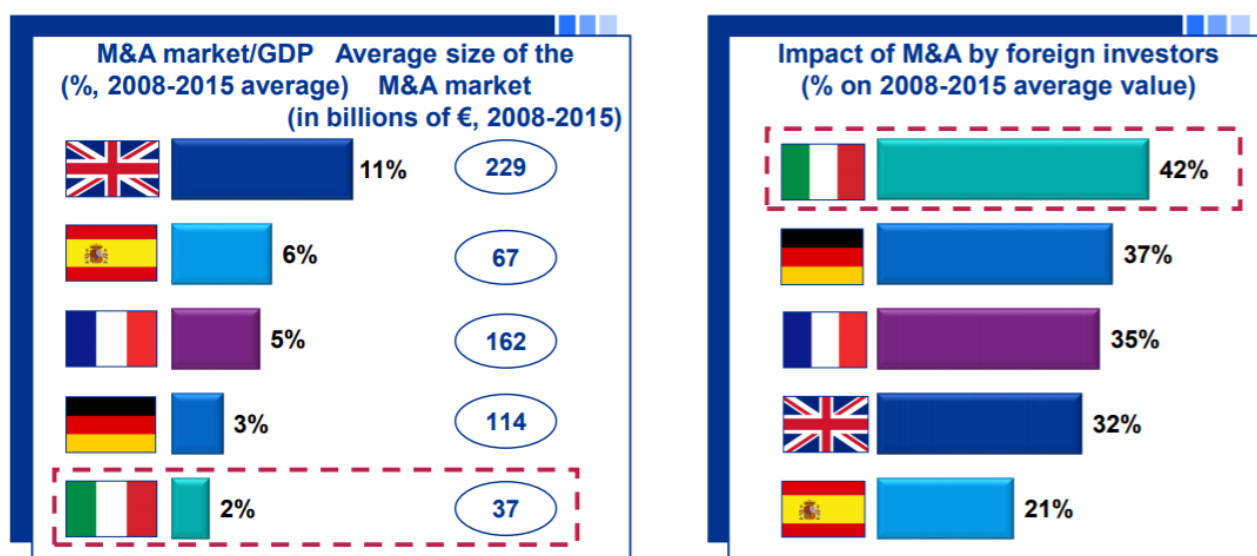
The following table provides the GDP growth rates of Italy and China in 2014 – 2016.

	2014	2015	2016
China	8.4%	11.8%	14.5%
Italy	2.7%	1.9%	2%

These trends are explained by the fact that Italian companies are less inclined – than other European companies to conclude an M&A and are more willing to negotiate with foreign investors, as shown by the following table.

Figure 5 - Italian M&A market outlook

The following figure report on the right the portion of Italian GDP represented by the M&A market compared with other European countries (UK, Spain, France, and Germany in order of appearance). The same countries are used in another comparison on the left. This chart reports the percentage of the M&A market value which foreign investors cover. Both the figures are computed in the period 2008 – 2015.



One crucial reason for this low level in the M&A market activity must be searched in Italian companies' characteristics. They have smaller dimensions both in terms of employee number and revenues. SMEs are common and widely diffused in Italy: a study from an Italian institution reports that companies with less than 50 employees are more than 99% of the overall number of firms present in Italy, and those with less than nine employees are the 95% of the total. Additionally, SMEs hired around 65% of the total Italian workforce.

This result is highly crucial in understanding the lack of development of the M&As market. Indeed, it may be significantly more difficult for a smaller company to merge with another one, and it is often an option that is never considered. SMEs usually have both a lack of financing to afford this transaction and a lack of competencies. Moreover, reaching a professional advisor may be costly, or entrepreneurs do not even know they exist. It explains how difficult it can be for a significant small company to consider a special operation such as a merger or an acquisition. Alongside the smaller size of the companies – which by itself is already a reason to justify the current situation of the Italian merger market – there is a psychological behavior.

Many Italian companies are family companies founded by the parents or grandparents of the current managers; therefore, they have a natural emotional bias in favor of keeping control of the company. Moreover, in keeping the companies, Italian entrepreneurs also attribute a negative perception in letting strangers enter their business as smaller is the business, as bigger are these biases. M&As analysts and

advisors in Italy face significant challenges, especially in the first steps of the M&A activity when they have to talk with their clients and explain the need to sell or merge with another company. Often, they would prefer to increase their debt – also mortgaging personal goods – instead of selling a part of their business. Moreover, it is common for family members to remain in the business even if it is not strategically advisable. Similarly, it is not uncommon that they oppose some reorganization procedures that are fundamental for the business.

However, these data also give another information: M&As can be considered a useful tool for Italian companies to grow and reach other European countries' levels. For this reason, we probably experienced transactions increase during recent years, together with a slow change of mentality in favor of consolidation. The Italian merger market – while undeveloped if compared with other European ones – can act as a springboard for the improvement of the market itself and the signing of future successful European deals.

Other sources of differences in the Italian market are the low level of takeovers, the low relevance of LBOs operations, and the difficulties in financing the operation through the securities market. Together with the already mentioned reasons, other characteristics of the Italian market can explain this situation. First, there is a low presence of financial experts compared to industrial ones; this decreases the number of takeovers and LBOs, which traditionally are based on a more financial perspective. Moreover, companies have an old financial structure that should be modernized to support complex, extraordinary operations. However, as already mentioned, a good signal started to arrive after the financial crisis and continued, contributing to creating the current scenario.

In conclusion, the Italian market differs from the Sweden one as it is relatively new: it experienced mainly two waves: one pre and one post-financial crisis. Additionally, the psychological behavior of entrepreneurs and the singular financial structure of Italian companies made it difficult to conclude this kind of operation in the past. However, good signals are coming, and positive developments are expected for the future.

Current trends

Before starting with the empirical analysis, we provide information regarding the current trend of the Italian M&As market. It is important to understand the future development of this market and the whole Italian business environment. According to a study conducted by KPMG and Bocconi university, companies who pursue M&A create more values both in terms of higher income and higher revenues than those who do not exploit this leverage. M&As activity – conducted regularly and following a clear plan – represents a good strategy for companies' growth in the long run.

It is even more important in a country such as Italy, where the small company dimension – as discussed above – limited the development of this market and also has a relevant impact on the company itself. Smaller companies are less competitive internationally, can afford lower investment in research and development, and usually have much more difficulties attracting high-level human capital.

The clearest solution is to grow through a merger. The most growing companies in the last 20 years – according to the annual report of merger and acquisition in Italy – are those who pursued these transactions during their company's life on a continuative basis. Some examples could be companies like Amplifon, Autogrill, Biesse, Brembo, Campari, Cerved, Coesia, Granarolo, Luxottica, GI Group, Hera, Interpump. Thanks to M&As, they have been able to diversify their product portfolio, enter new markets, buy new brands, and enforce their *know-how*.

After the financial and sovereign debt crises, Italian M&A experienced continued growth, which stopped in 2019 when the market did not fulfill the expectations. The volumes increased, but the values did not. One of the main reasons behind the decrease of 60% in the overall transaction value is the misalignment between demand and supply. It is due to the increase in valuations after years of liquidity abundance. Additionally, for the first time, PEs have been the first investor in the Italian market for a total value of 10 billion euro.

2020 has been even worse, with 830 deals concluded (-24% compared to 2019) for a total transactional value of 35 billion euros (-34%). However, the pipeline for 2021 registers impressive levels. The most important – and evident – reason is the impact

of the pandemic, which shrunk the valuations and the deals. However, M&As players adapted quickly to the changes and have been able to exploit the high number of opportunities present in the Italian market, starting many deals in 2021.

In 2020 the number of foreign companies investing in Italy was low, but in line with previous years, while the number of Italian investments in foreign companies decreases significantly (6 billion euro compared to the 18 of the precedent year). On the contrary, increased domestic operations (+18% in terms of values).

In conclusion, the Covid-19 pandemic affected the Italian M&A market, as it did for many other industries, but there is a good expectation for the current year and future. It happened as companies blocked deals that started during 2019 and decided to wait to start new ones. The high uncertainty environment reduced the trust in the market and made it hard to evaluate companies predicting future cash flows correctly. Additionally, in 2020 companies experienced a serious liquidity crisis due to the country lockdown and the collapse in revenues.

2020 has been a negative year that deleted the previous periods' positive trend; however, the causes are clear. An event-driven crisis sets at the basis of this financial collapse, but once this is overtaken, the confidence in the market will be back. Moreover, governments and European Union are introducing a huge amount of financing, which injects much liquidity in the market. For these reasons, we expect a positive 2021 characterized by two positive elements. First, the deals not concluded in the previous year will be potentially recovered once the crisis is over. Secondly, the high liquidity level will incentivize acquisition and other extraordinary activities.

Chapter 2: The study

In this paragraph, we will examine the behavior of M&A waves during the financial and the European sovereign debt crises. The first test concluded to determine if the number and/ or the value of the deals increased compared to no-crises periods in the timeframe indicated. In order to do so, we created a first sample collecting all the M&A transactions concluded in Italy in the last 15 years (from 2006 to 2021). In this way, we

can capture the behavior of the deals during different economic scenarios, and we have some reference data which represent the current pandemic crisis.

The criteria used to create the sample are summarized in the table below:

Table 21 – Screening criteria

The following table contains all the criteria used to create the sample of M&A transactions concluded in the Italian market during the last 15 years.

<u>Screening Criteria</u>	
1) <i>Company Type (Sellers):</i>	Public and Private Companies
(And) <i>Company Type (Buyers):</i>	Public Company
2) <i>Geographic Locations (Target):</i>	Italy
3) <i>Transaction Types:</i>	Merger/Acquisition
4) <i>All Transactions Announced Date:</i>	[4/1/2006-4/1/2021]
5) <i>Industry Classifications (Target/Issuer):</i>	Energy (Primary) OR Real Estate (Primary) OR Materials (Primary) OR Industrials (Primary) OR Consumer Discretionary (Primary) OR Consumer Staples (Primary) OR Health Care (Primary) OR Information Technology (Primary) OR Communication Services (Primary) OR Utilities (Primary)

We exclude transactions where the target was a financial institution as it may be subject to different considerations. However, the sample contains Real Estate and Utility industries, which are regulated assets. The decision to include them in the sample derives from the observation that they do not impact the overall performance assessment relevantly, and we want to keep consistency with the sample created for the Nordic analysis.

The overall sample contains 909 transactions – out of them, only 66 canceled in the 15 years of the analysis. These are divided among the sector analyzed based on the following figures:

Table 22 - M&A transactions by sector, last 15 years

The table provides the number of transactions in each sector considered for the two samples created. The sample excludes M&A deals with a financial target. The relative industry size equals the ratio between the transactions number in that industry over the total deals in all the industries (counting those excluded by the sample).

<i><u>Number of Transactions by Sector</u></i>	<i><u>Relative size</u></i>
Energy	33 3.63%
Real Estate	22 2.42%
Materials	35 3.85%
Industrials	151 16.61%
Consumer Discretionary	97 10.67%
Consumer Staples	23 2.53%
Health Care	35 3.85%
Financials	199 21.89%
Information Technology	70 7.70%
Communication Services	61 6.71%
Utilities	138 15.18%
No Primary Industry Assigned	45 4.95%

The most important information is that the most active sector is the financial one. It is not in contrast with the constraint mentioned before, as we now consider deals concluded in the financial industry, all those which have a financial buyer (and eventually seller) even if the target does not belong to the same industry. Indeed, in Italy, many financial institutions pursued many transactions acquiring companies not strictly related to the financial sector during the last ten years.

A second relevant piece of information is that the other most developed – in terms of M&As – sectors in Italy are the industrial, utilities, and consumer regulated ones, representing a difference from those most active in the Nordics. The high presence of financial buyers is evident also by analyzing who are the most active buyers by the number of transactions:

Table 23 - 10 most active buyers by deal number, last 15 years

The table provides a list of the ten most active buyers by the number of transactions in the last 15 years. The size of each buyer is computed over the total number of transactions concluded in the period considered.

<i><u>Company Name</u></i>	<i><u>Num. Of Transactions</u></i>	<i><u>Relative size</u></i>
Intesa Sanpaolo S.p.A. (BIT:ISP)	29	3.19%
Banca IFIS S.p.A. (BIT:IF)	26	2.86%
Italgas S.p.A. (BIT:IG)	16	1.76%

<i>Società Cattolica di Assicurazione</i>	16	1.76%
<i>algoWatt S.p.A. (BIT:ALW)</i>	14	1.54%
<i>BPER Banca S.p.A. (BIT:BPE)</i>	14	1.54%
<i>illimity Bank S.p.A. (BIT:ILTY)</i>	14	1.54%
<i>Banco BPM Società per Azioni (BIT:BAMI)</i>	13	1.43%
<i>Edison S.p.A. (BIT:EDNR)</i>	13	1.43%
<i>UnipolSai Assicurazioni S.p.A. (BIT:US)</i>	11	1.21%

The first two most active buyers – in terms of deals concluded – are financial ones. Moreover, other financial players are present in the top ten. Therefore, the decision to include financial buyers in the analysis is a consequence of the high relevance they have in explaining the Italian merger market. It is indeed significantly different from the Nordic one, although they may seem similar in terms of fragmentation. In the Italian market, the main deals are concentrated in the financial industry, while in the Nordics are spread among different industries. One explanation is that the financial industry is much more developed in terms of M&A culture and has – on average – more fragmented ownership, which does not present the already discussed emotional bias typical of many Italian entrepreneurs. Similar results can be concluded if we analyze the most active buyers by transaction values:

Table 24 - 10 most active buyers by deal value, last 15 years

The table provides a list of the ten most active buyers by transaction's value in the last 15 years.

<i>Company Name</i>	<i>Total Transaction Size (\$mm)</i>
<i>Intesa Sanpaolo S.p.A. (BIT:ISP)</i>	62,329.42
<i>UniCredit SpA (BIT:UCG)</i>	30,969.36
<i>London Stock Exchange Group plc (LSE:LSEG)</i>	21,993.04
<i>Leonardo S.p.a. (BIT:LDO)</i>	18,312.58
<i>Banco BPM Società per Azioni (BIT:BAMI)</i>	17,708.35
<i>EssilorLuxottica Société anonyme (ENXTPA:EL)</i>	17,295.29
<i>CK Hutchison Holdings Limited (SEHK:1)</i>	17,108.88
<i>Banca Monte dei Paschi di Siena S.p.A. (BIT:BMPS)</i>	14,077.38
<i>Alitalia-Linee Aeree Italiane S.p.A.</i>	13,129.33
<i>Meridie S.p.A.</i>	13,129.33

The majority of these companies operate in the financial industry or are directly related to that.

If we finally analyze the average magnitude of the deals in term of value, we can observe the following:

Table 25 - Number of Deals by Transaction Ranges

This table provides a breakout of the number of transactions based on their deal value.

Number of Deals by Transaction Ranges

<i>Greater than \$1 billion</i>	51
<i>\$500 - \$999.9mm</i>	28
<i>\$100 - \$499.9mm</i>	107
<i>Less than \$100mm</i>	434
<i>Undisclosed</i>	289

The Italian M&A market reflects the expectations in terms of deals. The overall number of transactions in the last 15 years is lower than those concluded in the Nordic market, and on average, these deals are of lower amount. It is the consequence of a still low developed market that actually hides a lot of growth potential, as proved by last years' trends.

Based on this sample, we retrieved the same studies we did for the Nordic market and we report here the summarizing table.

Table 26 - Empirical study outlook

The table summarizes the main steps covered in each study. There will three different studies which aim to achieve different conclusions. Each test is divided into two parts; these parts together give a complete overview of the phenomena studied.

	<i>Part A</i>	<i>Part B</i>
<i>Test 1: Analysis of M&A trends</i>	Analysis of the number of M&As concluded in the Nordic Market during the last 15 years.	Analysis of the total deals' value concluded in the Nordic market during the last 15 years.
<i>Test 2: Analysis of bidders' profitability during the crisis</i>	Analysis of bidders' absolute return measured in terms of stock price variation since the announcement.	Analysis of the bidders' Abnormal Returns (ARs). The significance of these returns is verified with a statistical test.

Test 3: regression analysis

The bidders' returns are computed at different periods.

Use of market variables as predictors

Use of companies' variables as predictors

Analysis of M&A trends

This paragraph aims to investigate if the same trends previously observed for the Nordics are also valuable for the Italian market.

Specifically, we study the number of deals concluded in the last 15 years and the total related value transacted. For comparison, we report the same graphs and study the differences and similarities among them.

Figure 6 - Italian M&A deals (#), last 15 years

The figure reports the number of M&A deals announced in the Italian market between 2006 – 2021. Data are based on the sample before introduced, which comprises all the transactions with public targets belonging to any sector except the Financial industry.

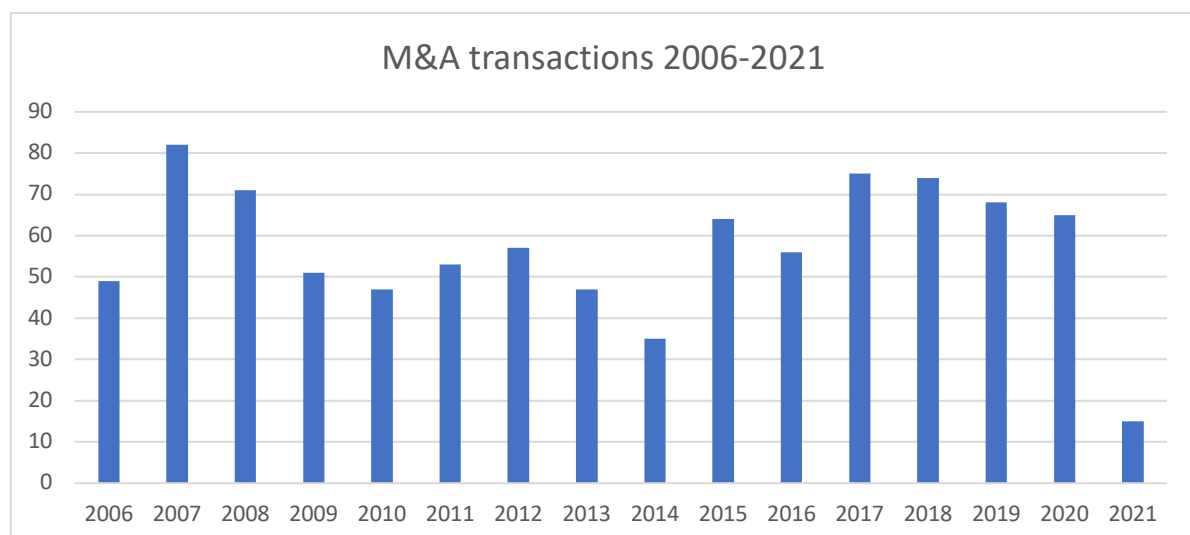
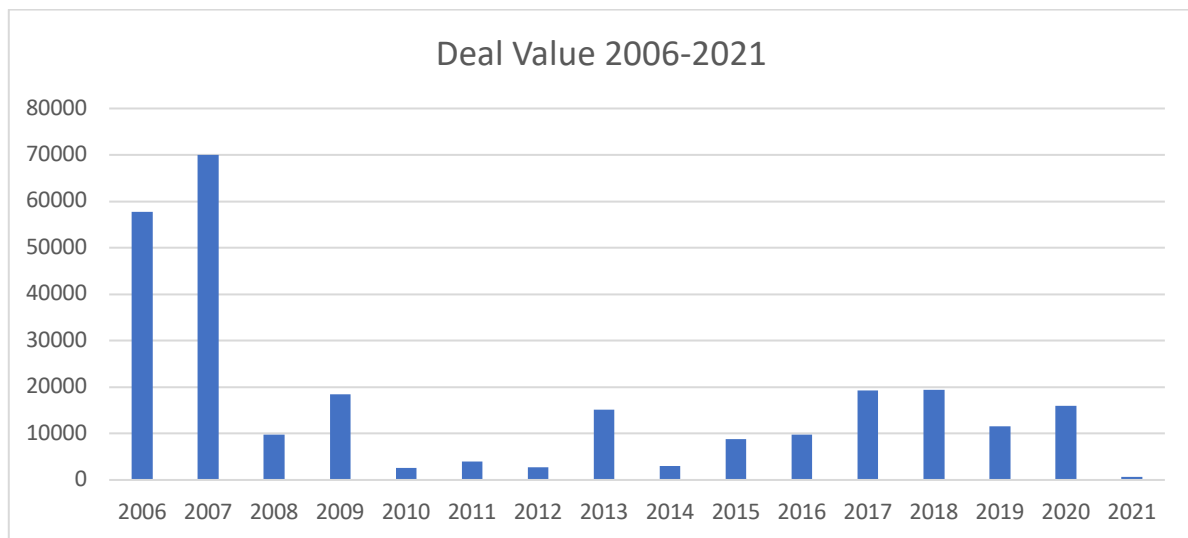


Figure 7 - Italian M&A values (€), last 15 years

The figure reports the value of M&A deals announced in the Italian market between 2006 – 2021. Data are based on the sample before introduced, which comprises all the transactions with public targets belonging to any sector except the Financial industry.



The first graph is quite consistent with the findings observed in the Nordic market: the number of operations concluded decreases at the beginning of the crises and continues the trend usually for two years after it. It is a consequence of the increasing uncertainty and the probable lack of liquidity.

However, the more interesting result regards the overall value of M&As registered each year. While in the Nordic market, we observed a pick in the years of significant distress, it seems that it is less evident in the Italian market, and it is partially delayed to the year after the crisis pick. For instance, the pick of the sovereign debt crisis is not in 2011-2012, but instead in 2013. However, it is still clear that values increase during distressing periods, even if with some delays probably due to a lower reactivity of Italian management and a longer Italian time required to execute the deal rather than in the Nordics.

In support of this finding, a recently published study on the Italian M&A market by KPMG reports that the first quarter of 2021 has outperformed the first quarter of 2020 (when the Covid-19 crisis impacted only for the last month). The results prove that while a slight decrease in the number of deals concluded, the value increased from around 10 billion euro (1st quarter 2020) to more than 26 billion euro (1st quarter 2021). Moreover, 94% of the overall value is represented by the first ten deals (by value). It confirms the finding that during crises, there are fewer deals in terms of number but much bigger in terms of value.

Analysis of bidders' profitability during a crisis

The second test aims to investigate bidders' returns during the financial and sovereign debt crises. Specifically, we want to observe if bidders actually registered those negative performances which everyone links to M&A buyers or outperformed somehow.

In order to complete these analyses, we revised the sample previously introduced, limiting it only to those transactions announced between 2008 – 2010 (financial crisis) and 2011 – 2012 (sovereign debt crisis). The criteria used to build the sample are the same for the broader sample, obtaining 279 transactions: 263 closed and 16 canceled.

In terms of aggregates, the results are quite comparable to those already observed; the relevant industries remain the financial, utilities, and consumer good ones.

Table 27 - M&A transactions by sector, financial and sovereign debt crises

The table lists the number of M&A transactions concluded in each sector during 2008 – 2012 in the Italian market. The size of each industry is computed relative to the whole number of M&A transactions present in the sample.

	<u><i>Number of Transactions by Sector</i></u>	<u><i>Relative size</i></u>
<i>Energy</i>	14	5.02%
<i>Real Estate</i>	10	3.58%
<i>Materials</i>	7	2.51%
<i>Industrials</i>	45	16.13%
<i>Consumer Discretionary</i>	33	11.83%
<i>Consumer Staples</i>	8	2.87%
<i>Health Care</i>	15	5.38%
<i>Financials</i>	57	20.43%
<i>Information Technology</i>	15	5.38%
<i>Communication Services</i>	15	5.38%
<i>Utilities</i>	46	16.49%
<i>No Primary Industry Assigned</i>	14	5.02%

All the other aggregates report similar information to those used on the broader analysis and are therefore disregarded.

In the Nordic market, we observed that, on average, 50% of the bidders had a positive return, and around 2/3 of them had a return higher than -1% both during the financial and the sovereign debt crisis. In the Italian, we instead observe the following results:

Table 28 - Bidders' positive absolute returns

The table provides the number of transactions in which the bidders registered a positive absolute return. Data are available for both crises. The size is computed over the total number of deals available in our sample for the reference period.

		<i>Announcement</i>	<i>5d after</i>	<i>1m after</i>	<i>6m after</i>	<i>1y after</i>
2008	<i># transactions with positive return</i>	91.0	79.0	72.0	54.0	56.0
-						
2010	<i>Relative size</i>	61%	53%	48%	36%	38%
2011	<i># transactions with positive return</i>	51.0	42.0	46.0	38.0	40.0
-						
2012	<i>Relative size</i>	57%	47%	52%	43%	45%

Comparing these results with those from the Nordic market, we can see better performances, especially during the financial crisis. It supports the idea that as much heavier the crisis is, there are many opportunities for the bidders. Therefore, if they are able – and can do so – to exploit these opportunities, they can achieve better returns.

Similar results with the Nordics are instead present for the sovereign debt crisis, notwithstanding Italy has been much more affected by this crisis. On the contrary, a source of difference is when these countries reacted to the announcement. Indeed, while Italy registers a pick of positive returns immediately at the announcement, the Nordics need to wait the first week to observe the same level of positive returns in relative terms. However, the general path of initial positive performances, which tend to diminish approaching the year, is confirmed.

Moreover, we also studied the number of returns only slightly negative: higher than minus one percent. The rationality is that these slightly negative performances cannot be considered a complete failure of the M&A transaction. On average – for both the crises – there is a high pick at the announcement with around 75% of the bidders

registering returns higher than -1%, and then these values quickly converge to the same numbers observed for positive returns. This result can support the thesis that bidders benefited from the announcement as their returns increased after that but quickly lost the advantage, and the returns converged to normal ones.

The same study has also been done on the abnormal returns computed as difference with the CAPM: this lets us observe if these companies actually created value. The following table provides the same information:

Table 29 - bidders' positive ARs, financial crisis

This table provides the number of positive abnormal returns registered by the bidders in the sample during the financial crisis. The abnormal returns are computed as the difference between the bidders' absolute returns and the market model (CAPM). The size is computed as the ratio between the positive ARs and the total ARs observed in the sample.

<i>2008-2010</i>	<i>Announcement</i>	<i>5d after</i>	<i>1m after</i>	<i>6m after</i>	<i>1y after</i>
<i># transactions with positive AR</i>	75.0	71.0	66.0	43.0	40.0
<i>Relative size</i>	51%	49%	46%	30%	27%

Table 30 - bidders' positive ARs, sovereign debt crisis

The table provides the number of positive abnormal returns registered by the bidders in the sample during the sovereign debt crisis. The abnormal returns are computed as the difference between the bidders' absolute returns and the market model (CAPM). The size is computed as the ratio between the positive ARs and the total ARs observed in the sample.

<i>2011-2012</i>	<i>Announcement</i>	<i>5d after</i>	<i>1m after</i>	<i>6m after</i>	<i>1y after</i>
<i># transactions with return higher than CAPM</i>	42.0	39.0	41.0	32.0	29.0
<i>Relative size</i>	48%	45%	47%	36%	33%

In the case of excess returns, not big difference can be found with the Nordic market. The relative values are similar at any time, except the excess returns at six months and at one year during the sovereign debt crisis, lower in the Italian market. However, as observed from the regression study, at least in the Nordics, these returns are partially explained by the market. We can therefore expect that the better performance in the Nordic can be attributed to a better market situation. Suppose the following

regression analysis confirms that excess returns at one year – for the Italian market - are also explained by the market variables. In that case, we can conclude that the lower Italian performance is explained by a worse economic environment rather than by a less profitable M&A.

However, it is necessary to check the statistical significance of ARs, as done for the Nordic market. This analysis is based on the same steps completed for the Nordics and aims to verify if the positive abnormal returns are statistically different from zero. In other words, the null hypothesis tests if the average of ARs is equal to zero. The following tables summarize the test results:

Table 31 – Inference test on Abnormal Returns, financial crisis

The table summarizes the main ARs' statistics for five different subperiods following the M&A announcement during the financial crisis. The statistics reported are the ARs average and their standard deviation computed as the square root of the variance. The T-test is computed as ARs average divided by $s/\sqrt{n}$ where n is the number of observations in the sample.

	<i>Announcement</i>	<i>5d</i>	<i>1m</i>	<i>6m</i>	<i>1y</i>
<i>AR medio</i>	0.01	0.004	0.001	(0.03)	(0.09)
<i>St. dev sample</i>	5.26%	10.88%	16.22%	47.64%	63.84%
<i>T test</i>	1.42	0.49	0.09	(0.83)	(1.69)
<i>N</i>	147	144	145	147	147

As the sample is sufficiently broad, in this test it is possible to assume a standard normal distribution. Moreover, as it is a bilateral test it is necessary to compare the value of the test statistic with the values of the normal distribution in both tails. Based on the confidence level selected the comparable values are the following.

Table 32 - Normal distribution values

The table provides the values of the standard normal distribution based on the selected confidence level

<i>Confidence level</i>	<i>1.0%</i>	<i>5.0%</i>	<i>10.0%</i>
$\alpha/2$	0.5%	2.5%	5.0%
$N(\alpha/2)$	-2.58	-1.96	-1.64

To reject the null hypothesis, $N(\alpha/2)$ should be lower than the test statistic. Comparing the values between the two tables it is possible to conclude that bidders' ARs are never statistically different from zero except at one year from the announcement and at 10% confidence level. This result is in line with the Nordics findings and confirms that approaching one years the market behavior impacts always more bidders' profitability. Indeed, at one year time the ARs in Italy are slightly negative, due to the high impact of the financial crisis. in the Nordics, on the contrary they were statistically equal to zero as the impact of the crisis was lower.

A similar studied is carried out for the sovereign debt crisis:

Table 33 - Inference test on Abnormal Returns, sovereign debt crisis

The table summarizes the main ARs' statistics for five different subperiods following the M&A announcement during the sovereign debt crisis. The statistics reported are the ARs average and their standard deviation computed as the square root of the variance. The T-test is computed as ARs average divided by $s/\sqrt{n}$ where n is the number of observations in the sample.

	<i>Announcement</i>	<i>5d</i>	<i>1m</i>	<i>6m</i>	<i>1y</i>
<i>AR medio</i>	0.01	0.022	0.024	(0.11)	(0.17)
<i>St. dev sample</i>	4.53%	24.03%	27.50%	30.41%	37.28%
<i>T test</i>	1.59	1.07	1.02	(4.36)	(5.47)
<i>N</i>	139	136	137	139	139

The test for the sovereign debt crisis confirms all the findings before mentioned. First, abnormal returns are not statistically different from zero in the period following the announcement. On the contrary they are slightly negative and highly significant 6 months and one year after the announcement. This is due to the higher impact that the sovereign debt crisis had in Italy compared to the Nordics. In the previous chapter we discussed the severity of this crisis in Italy rather than in the Nordics and the related impact on bidders profitability. This results highly confirms the thesis and also prove that approaching one year after the announcement bidders' returns are much more influenced by the market environment rather than by the M&A transaction.

The third and last test aims to investigate which variables had a role in determining the positive return for some buyers. To compute the test, we use the regression model and the following independent variables:

1. The difference between the value of the MSCI Nordic index 1 month after the announcement and 1 month before the announcement. This variable is intended to capture the market behavior during the announcement period. A negative value for it would imply that in the period of the announcement, the market had negatively performed.
2. A volatility index at the announcement date to capture the uncertainty of the market. It has been selected S&Ps Southern Europe low volatility index
3. A momentum representation. In order to determine the momentum, we constructed the index according to the following steps. We collected the values of the MSCI Nordic Index 1 month, 2 months and 6 months after it and the corresponding daily returns for each announcement date. We then computed the moving average for each of them at 15 days intervals. Finally, to compute the momentum, we subtracted to the 1 month the six months moving average and from the 2 months the six months moving average. In this way, we obtained two different momentum representations (both of them weekly and bi-weekly computed). We will observe which of them is more significant in the regression process.

The same analysis conducted in the Nordic market was also done in the Italian one, using as a dependent variable the absolute and the excess returns over CAPM at one week, one month, and six months after the announcement. Moreover, to better appreciate the differences between the two crises, we separated the samples, and we conducted the analysis on the sub-samples separately.

Starting from the market variables, we immediately notice that the one-week returns are explained by neither the market index nor the volatility index. The R^2 is close to zero, and the F significance value is much higher than the 5% limit. Moreover, the coefficients are statistically equal to zero, and their p-values are not significant. Therefore, it is evident that in the case of the Italian M&A market, the bidders' returns were not explained by the market one week from the announcement. The relevance and the impact of the merger's announcement remain a clear determinant in contributing to companies' performance. Similar results can be observed for the momentum variables, even though this is the one with the most significant values among the threes. However, overall, it still does not appear relevant in explaining the market returns.

If we instead analyze the returns after one month, we observe high statistical significance – compared to the other analysis – for the market index. The regression of absolute returns on this variable alone had an R^2 of 18% and a coefficient highly significant but extremely close to zero. It proves that returns are explained by the MSCI index but with low impact. Indeed, also the momentum variables are low significant, proving the low power of the market.

At six months, instead, the winning variable is the volatility index with an R^2 of 18% and a coefficient p-value of 0.016851189. Moreover, overall, the market seems to explain a higher portion of returns over time. It is the answer we were looking for at the end of test two. The relevance of the market in explaining bidders' returns at one year from the announcement can explain their lower values of Italian performances compared to the Nordics due to the higher crises' impact.

In conclusion, different market variables contribute in different moments to these returns. As we observed, the Italian M&A market is much less developed by the Nordic one, and it is not surprising that some of these variables affect the returns in different moments. The benefits coming from the merger may be partially offset due to the underdevelopment of the market and the higher level of regulatory frictions present in Italy.

Moreover, if we combine these variables among them, we don't see any improvement in returns one week after the announcement, as we expected from the Nordic analysis. Instead, the combined effect of the market index and momentum computed as difference 1-6 months brings to an R^2 of almost 22%, F significance of 2.18192E-08, and both significant coefficients for one-month returns. The most interesting value is the momentum coefficient equal to -6 (p-value of 0.008496183), indicating a negative relationship between the momentum and the absolute returns. It is an important result as it proves that bidders' returns – during the financial crisis – are mainly explained by the M&A announcement immediately after it; in the following month, they benefit from the crisis environment with an inverse relation, which means that the decision to a merger in this specific time has favored these transactions.

Concerning the six-month analysis, the most significant regression is obtained combining all the three variables, always using momentum as difference 1 minus 6 months moving averages. The significance level is 20%, and the highest coefficient remains the momentum one, still negative.

If we finally study the impact of the accounting figures, we observe different results from the Nordic market, but these lead to the same conclusion. In the Nordic, we observed the accounting figures' higher impact when the market failed the most to predict returns. We explained that it could be linked to the intrinsic characteristics of the firms and hence their ability to obtain benefits from the M&A just announced. In the Italian market, these variables still significantly impact one week after the announcement (32% R^2), which is constant at 1 month and then decreases at six months (20% R^2) when the market explains a higher portion of returns.

The most significant variable at any of the three sub-periods studied remains the FCF/Sales, which already was significant in the Nordic market. However, in this case, it seems to impact even more. One possible explanation may be linked to the higher importance that CFs have for Italian bidder companies. Indeed, they usually may have more significant issues in repaying debt or ensuring stable cash flows due to the higher costs of the transaction and the more unstable Italian market. Therefore, a company with better CFs will be better priced by the market and benefit from higher stock returns.

We then performed the same analysis on the excess returns in order to observe any potential difference. Regarding the one-week returns, no significant differences are present compared to absolute returns. It is also in line with the Nordic market findings. Indeed, on average, in the Nordics, there were not any differences in all the variables.

It confirms the idea that excess returns are influenced by the same variables of the market and – therefore – those companies that during crises had positive returns are also those that probably outperformed the CAPM according to this study. Moreover, similar results have been observed for the one-month and six-month returns, when the most significant variables have been the market and the volatility indexes, respectively.

The same conclusions can be made for the regressions on the accounting figures, confirming that – on average – the variables which explain absolute returns are the same for the excess returns. It means that the performance of the absolute ones drives the excess returns.

Sovereign debt regression analysis

The same set of regressions have also been concluded for the period 2011-2012, and here we will analyze the main differences between the two crises and the two markets. Starting from absolute returns, we confirm the extremely low level of significance of the market variables. Combining the market and the volatility indexes, we obtain a maximum R^2 of 2.2%, confirming that the market fails in predicting returns the week after the announcement. Interestingly, we observed that these variables better explained bidders' returns in the Nordics for the same periods. We concluded that this was linked to the lower impact that the sovereign debt crisis had on the Nordics and the consequential lower benefits recorded by the M&A industry. On the contrary, Italy was much more affected, and therefore companies that merged during this period could have benefited from better conditions (lower seller valuations, for example), boosting their returns. The result is that their returns – after the announcement – were less explained by the market and more by the M&A.

Instead, for the one-month and six-month returns, we see an increase of market variables significance as expected, with the same impact of the market index in the first sub-period and volatility index in the second.

A big difference is observed in the accounting figures that do not explain the returns computed one week after the announcement but increase their significance in the following sub-periods. Moreover, in this case, the most significant variable is the EV/EBITDA, often used as a reference multiple in M&A transactions. It may confirm the idea that in the highly distressed period of the Italian sovereign debt crisis, those companies which benefited from positive returns are those with high valuation and high growth potentials.

Finally, the excess returns behave in the same way as absolute ones confirming the already mentioned conclusions. In the appendix, we provide four tables summarizing the main regression results and variables.

Conclusions

In conclusion, we retrieved the same analysis conducted in the Nordic market for the less developed – in terms of M&A industry – Italian one. The aim was to find similarities and differences between the two.

The first clear result is Italian bidders – exactly as Nordic ones – have partially benefited from the crisis environments. Their stock returns increased, compared to CAPM, and the diffused theory that bidders register negative performances after the announcement has been partially confuted. However, the significance of the positive ARs has not been proved and they result statistically equal to zero. Therefore, exactly as observed for the Nordic market, this study opens the question to further research, to observe if, for example during the current pandemic crisis, the bidders' profitability improved or not.

Similarly, approaching the one-year period, the M&A announcement effect tends to vanish, and the market variables turn to explain the majority of bidders returns.

However, also some differences can be noticed. In particular we observed that the Italian market is much different: the higher level of underdevelopment lowered the power of positive returns and the market variables had a higher impact in explaining returns. Regression analysis allowed us to understand that the market, the volatility and the momentum, still play a role, meaning that the announcement of a good transaction alone is not enough to guarantee good returns as it could be for the Nordics. Especially, one month and six months after the announcement, these variables increase their relevance meaning that Italian bidders are not safe from the market crises. The reason, once again, should be researched in the quality and development of the Italian M&A market, which is still too full of frictions and biases.

The second important finding is linked to the magnitude of the crises and its relevance has been confirmed. Higher it is, better the bidders' performances. The comparison between the two crises, allowed us to observe that as much as the crisis impacts the country, more benefits are register by bidders. The reason is that buyers can benefit

from lower valuations for the sellers, higher number of deals, better growth opportunities once the market is recovered.

In conclusion, the Italian M&A market shares the same characteristics of the Nordic one, in terms of response to the crises, but also proved the need of further development. The current pandemic crisis, which is occurring ten years after the reference period of this study, can be a solid proof for these statements. In 10 years, the Italian M&A industry developed a lot and probably has been much more efficient in exploiting all the advantages that this current situation may have offered to it.

The available outcomes and predictions of the industry, actually forecast an increasing pipeline and an extremely profitable year for the M&A sector, basically confirming our expectations.

Figure 3, Attachment 1 – Summary of regression results: Financial crisis, absolute returns

FINANCIAL CRISIS ABSOLUTE RETURNS											
5 DAYS ABSOLUTE RETURNS				1 MONTH ABSOLUTE RETURNS				6 MONTHS ABSOLUTE RETURNS			
Variable	R square	F significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient
FTSE Difference	0.08%	0.74215242	1.74E-05 0.74215242	-0.000319638 0.380426864	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
Volatility	0.81%	0.380426964	-0.000319638 0.380426864	-0.000319638 0.380426864	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
Mom. BI - Week (1-6)	2.21%	0.074417969	-2.428049468 0.074417969	-2.428049468 0.074417969	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
Mom. BI - Week (2-6)	1.61%	0.127908158	-2.470365106 0.127908158	-2.470365106 0.127908158	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
FTSE & Volatility	0.81%	0.559561579	9.23E-05 0.559561579	9.23E-05 0.559561579	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
FTSE & Mom. BI - Week (1-6)	4.45%	0.039600863	0.000119036 0.039600863	0.000119036 0.039600863	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
FTSE & Mom. BI - Week (2-6)	1.86%	0.364738481	3.15E-05 0.364738481	3.15E-05 0.364738481	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
Volatility & Mom. BI - Week (1-6)	2.93%	0.12141019	-0.000300025 0.12141019	-0.000300025 0.12141019	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
Volatility & Mom. BI - Week (2-6)	2.31%	0.189645125	-0.000297027 0.189645125	-0.000297027 0.189645125	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
FTSE & Vol. & Mom. BI - Week (1-6)	4.52%	0.08776768	0.000109522 0.08776768	0.000109522 0.08776768	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189
FTSE & Vol. & Mom. BI - Week (2-6)	2.38%	0.33306288	1.68E-05 0.33306288	1.68E-05 0.33306288	0.08% 0.742E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000413526 9.70E-08	0.000551557 0.00682189	0.000551557 0.00682189	0.000551557 0.00682189

Figure 4, Attachment 2 – Summary of regression results: Financial crisis, abnormal returns

The figure summarizes the results of regressing the abnormal returns on different market variables. As dependent variables have been used abnormal returns five days, one month and six months after the M&A announcement. As regressors are used the market, volatility and momentum indexes singularly and combined among them. For all the regressions are reported the R^2 and F significance together with the coefficient values and their p-values. The analysis refers to the financial crisis.

	5 DAYS ABNORMAL RETURNS			FINANCIAL CRISIS EXCESS RETURNS			1 MONTH ABNORMAL RETURNS			6 MONTHS ABNORMAL RETURNS		
	R square	F significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient	R square	F significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient	R square	F significance
	P values	P values	P values	P values	P values	P values	P values	P values	P values	P values	P values	P values
FTSE Difference	0.03%	0.832258295	1.16E-05	-0.000335656	-0.0003341231	14.99%	1.17E-06	0.000381093	0.000489972	0.000489972	2.86%	0.039785627
			0.812258295	0.270331975	2.26E-05			1.17E-06	0.000489972	0.000489972		0.039785627
Volatility	0.86%	0.262668239	-0.000325405	-4.271120626	0.000523788	5.77%	0.003268565	-0.001258758	-0.006404752	-0.006404752	17.27%	1.50E-07
			0.262668239	0.01191141	7.39E-08			0.003268565	-0.006404752	-0.006404752		1.50E-07
Mom. BI - Week (1-6)	2.39%	0.060630828	-2.547971273	-2.867203339	0.000403669	0.64%	0.335531692	1.95985344	-4.395019722	-4.395019722	0.37%	0.463126546
			0.060630828	0.00440893	2.78E-07			0.335531692	-4.395019722	-4.395019722		0.463126546
Mom. BI - Week (2-6)	1.97%	0.088839552	-2.764857498	-2.480924662	-0.001281531	1.20%	0.184936594	-3.219990122	-4.750442947	-4.750442947	0.30%	0.507069118
			0.088839552	0.08440893	2.78E-07			0.184936594	-4.750442947	-4.750442947		0.507069118
FTSE & Volatility	0.87%	0.531537456	-6.66E-06	-0.000335656	0.000341231	16.78%	1.64E-06	0.000341231	0.000154816	0.000154816	17.53%	8.51E-07
			0.871676742	0.270331975	2.26E-05			0.000341231	0.000154816	0.000154816		8.51E-07
FTSE & Mom. BI - Week (1-6)	4.31%	0.0409567	0.000114564	-4.271120626	-5.918426605	18.68%	3.09E-07	0.000523788	0.000935015	0.000935015	7.02%	0.005127483
			0.00095254	0.01191141	7.39E-08			0.000523788	0.000935015	0.000935015		0.005127483
FTSE & Mom. BI - Week (2-6)	2.11%	0.21319624	2.48E-05	-2.867203339	-4.883112467	17.70%	7.38E-07	0.000403669	0.000521875	0.000521875	3.49%	0.076205885
			0.00440893	0.00440893	2.78E-07			0.000403669	0.000521875	0.000521875		0.076205885
Volatility & Mom. BI - Week (1-6)	3.12%	0.100491119	-0.00030025	-2.480924662	-0.001281531	6.61%	0.007054741	-0.001281531	-0.006374622	-0.006374622	17.44%	9.24E-07
			0.270331975	0.08440893	2.78E-07			-0.001281531	-0.006374622	-0.006374622		9.24E-07
Volatility & Mom. BI - Week (2-6)	2.68%	0.139805695	-0.000295883	-2.461607035	-0.001227795	6.67%	0.006700721	-0.001227795	-0.006376742	-0.006376742	17.36%	9.94E-07
			0.00402749	0.10105613	0.00411715			-0.001227795	-0.006376742	-0.006376742		9.94E-07
FTSE & Vol. & Mom. BI - Week (1-6)	4.42%	0.044195144	0.000102756	-0.000125984	-0.000479968	-4.065388144	8.22E-07	0.000479968	0.000401352	0.000401352	18.47%	1.75E-06
			0.1680201	0.087279091	4.47E-06	0.022128864		0.000479968	0.000401352	0.000401352		1.75E-06
FTSE & Vol. & Mom. BI - Week (2-6)	2.69%	0.026930056	8.76E-06	-0.000281949	-0.000643839	-2.702541395	1.05E-06	0.000643839	-0.000173854	-0.000173854	17.68%	3.45E-06
			0.079533861	0.13542067	6.14E-06	0.102475085		-0.000643839	-0.000173854	-0.000173854		3.45E-06

The figure summarizes the results of regressing the absolute returns on different market variables. As dependent variables have been used absolute returns five days, one month and six months after the M&A announcement. As regressors are used the market, volatility and momentum indexes singularly and combined among them. For all the regressions are reported the R^2 and F significance together with the coefficient values and their p-values. The analysis refers to the sovereign debt crisis.

SOVEREIGN DEBT CRISIS ABSOLUTE RETURNS																	
5 DAYS ABSOLUTE RETURNS						1 MONTH ABSOLUTE RETURNS						6 MONTHS ABSOLUTE RETURNS					
	R square	F significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient		R square	F significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient		R square	F significance	Variable 1 coefficient	Variable 2 coefficient	Variable 3 coefficient
FTBE Difference	1.42%	0.25587278	0.000186806 <i>0.53572278</i>	-0.002749851 <i>0.12590446</i>		17.18%	3.62E-05	0.000746464 <i>3.61E-06</i>	0.000746464 <i>3.61E-06</i>		4.48%	0.041688692 <i>0.141688692</i>	0.000426611 <i>0.141688692</i>				
Volatility	1.70%	0.212930446	-0.002749851 <i>0.12590446</i>			4.10%	0.051543251	-0.004901517 <i>0.015449321</i>			16.57%	5.14E-05	-0.011025259 <i>5.14E-05</i>				
Mem. BI - Week (1-6)	0.07%	0.808504143	1.387595645 <i>0.808504143</i>			1.68%	0.216082058	8.093306022 <i>0.216082058</i>			0.59%	0.465031165	-5.364272429 <i>0.465031165</i>				
Mem. BI - Week (2-6)	0.01%	0.928755469	0.556976943 <i>0.587755469</i>			0.13%	0.731763885	-2.449281323 <i>0.731763885</i>			0.79%	0.396167828	6.773877253 <i>0.396167828</i>				
FTBE & Volatility	2.28%	0.355040577	-0.002106544 <i>0.37627244</i>	0.000128322 <i>0.468573161</i>		17.45%	0.000179255	-0.001346764 <i>0.51816248</i>	0.000709074 <i>0.000252683</i>		16.99%	0.000230218	-0.010323402 <i>0.000384283</i>	0.000140001 <i>0.593844721</i>			
FTBE & Mem. BI - Week (1-6)	1.76%	0.450085775	0.000256609 <i>0.16155458</i>	-4.002578728 <i>0.370303651</i>		19.50%	0.000057551	0.000955255 <i>2.31E-06</i>	-11.97715915 <i>0.11416531</i>		11.10%	0.005024456	0.000820866 <i>0.0150466</i>	-22.60685209 <i>0.01246253</i>			
FTBE & Mem. BI - Week (2-6)	1.43%	0.523354783	0.000187051 <i>0.25787879</i>	0.656397736 <i>0.33267214</i>		17.27%	0.000197223	0.000745699 <i>4.06E-06</i>	-2.05292896 <i>0.75302524</i>		5.33%	0.085187584	0.000429221 <i>0.640743979</i>	7.002157994 <i>0.17201254</i>			
Volatility & Mem. BI - Week (1-6)	1.72%	0.457552199	-0.002724332 <i>0.22135139</i>	0.826561354 <i>0.88524279</i>		5.39%	0.082460242	-0.004681411 <i>0.06325488</i>	7.129241436 <i>0.270411866</i>		17.77%	0.000150249	-0.01126248 <i>3.77E-06</i>	-7.683607067 <i>0.35508441</i>			
Volatility & Mem. BI - Week (2-6)	1.81%	0.43879532	-0.002882434 <i>0.201642966</i>	2.037557922 <i>0.740974129</i>		4.10%	0.151862592	-0.004906123 <i>0.05660158</i>	0.070780766 <i>0.982111681</i>		19.33%	6.33E-05	-0.011862516 <i>1.68E-05</i>	12.86713621 <i>0.08215872</i>			
FTBE & Vol. & Mem. BI - Week (1-6)	2.44%	0.529327773	0.000183423 <i>0.619744796</i>	-0.001918617 <i>0.431541262</i>	-2.860389704 <i>0.68482346</i>	19.55%	0.000218753	0.000933016 <i>0.00015268</i>	-0.000582999 <i>0.816261692</i>	-11.62508904 <i>0.138440574</i>	20.64%	0.000122482	0.00047001 <i>0.07629676</i>	-0.009197889 <i>0.01579431</i>	-17.13117468 <i>0.48606636</i>		
FTBE & Vol. & Mem. BI - Week (2-6)	2.36%	0.544182446	0.00012537 <i>0.61882032</i>	-0.002236678 <i>0.35954568</i>	1.772497718 <i>0.77984007</i>	17.49%	0.000642257	0.000711461 <i>0.000164535</i>	-0.001241525 <i>0.62874538</i>	-1.433409455 <i>0.830363551</i>	19.63%	0.000209617	0.00011899 <i>0.5649757</i>	-0.01124962 <i>0.00010218</i>	12.61556391 <i>0.09032586</i>		

The figure summarizes the results of regressing the abnormal returns on different market variables. As dependent variables have been used abnormal returns five days, one month and six months after the M&A announcement. As regressors are used the market, volatility and momentum indexes singularly and combined among them. For all the regressions are reported the R^2 and F significance together with the coefficient values and their p-values. The analysis refers to the sovereign debt crisis.

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All Data have been obtained from S&P Capital IQ and Eikon – Refinitiv databases.