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MERGER DECISIONS, ACCOUNTING INFORMATION AND PERFORMANCE STABILITY INSIDE AND OUTSIDE OF ECONOMIC CRISIS PERIODS: EVIDENCE FROM GREECE

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Abstract. This study examines the merger decisions from a sample of Greek listed companies in the economic crisis period and shortly after its end, by employing various quantitative and qualitative variables of mergers that signalize different levels of risk. The results revealed that the performance subsequent of mergers is not significantly different for the merged companies. But in comparison to control sample of companies without mergers for the examined period, the results reveal that merger transactions signalize a more stable profitability and better performance for the companies with mergers. Furthermore, merger events signalize different performance levels during and after the crisis: mergers that took place when there was no economic crisis are far more profitable and lead to better performance from mergers during the period of economic crisis. Last, regarding the industry relatedness of the merged firms, the industry type and the merger combination of merged companies, there is not any impact from them on the post-merger performance in the examined accounting measures. The study proposes for companies that during crisis periods maybe merger be the only way to survive and provide a stable profitability and accounting performance for shareholders.

Keywords: mergers, accounting measures, financial ratios, performance, economic crisis, Greece.

JEL Classification: G34, M40.

Introduction

Mergers and acquisitions are undoubtedly one of the most important ways for corporate restructuring worldwide (Hoshino, 1982; Healy et al., 1992; Golubov et al., 2013; Berrioategortua et al., 2018; Grigorieva, 2020; Rodionov & Mikhalchuk, 2020). They are a common occurrence in several industries, geographical areas and time periods, while in some other cases they occur with less frequency and intensity (Mueller, 1980; Jensen & Ruback, 1983;

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Ramaswamy & Waegelein, 2003; Martynova & Renneboog, 2008; Harrison, 2005). Their execution is associated with particular risks in relation to how they are implemented, due to the chosen business strategy and the characteristics of the merger by any company that wants to do a merger transaction (Lev & Mandelker, 1972; Amihud & Lev, 1981; Harford et al., 2009; Furfine & Rosen, 2011; Jandik & Lallemand, 2014; Harrison et al., 2014; Alhenawi & Krishnaswami, 2015).

Merger decisions during periods of crisis are a special area of research to study, due to the current interest it presents nowadays (Rao-Nicholson & Salaber, 2013; Rao-Nicholson et al., 2016; Pantelidis et al., 2018; Pazarskis et al., 2021; Lois et al., 2021). The macroeconomic environment affects directly the motives, but mainly plays an important role in the success of mergers, in any economy worldwide (Ibrahim & Raji, 2018). Over time, there have been a few studies that have examined the implementation of mergers in periods of economic crisis, but still there is a certain scarcity of studies. It is therefore of particular interest to implement a study that will investigate mergers during an economic crisis in any geographical area.

The worldwide economic crisis that began in 2008 in the United States has exacerbated on the next years the European debt issue. Following the European crisis, certain small European countries in the eurozone, particularly Greece, suffered terrible consequences. The Greek government used the "support mechanism", which was established by the International Monetary Fund, the European Union, and the European Central Bank, in 2009 (Pantelidis et al., 2018; Pazarskis et al., 2021). The existence of the IMF within the Eurozone, on the other hand, is a first and provides unique challenges for all parties involved in this past transaction. In fact, this is the first time in the IMF's history that the majority of its funds have been sent to a single country, an EU member state: Greece. As a result, it is evident that examining the effects of the economic crisis on merger decisions in developed countries and EU members in the Eurozone that accept the provision of a "support mechanism" is extremely fascinating.

As a result, Greek businesses of all sizes and industries were confronted with a slew of difficult financial issues and tried to employ every strategic solution to their problems (any potential form of corporate restructuring, including considering merger's option). Thus, this study examines empirically the implementation of mergers by companies in Greece during the recent economic crisis in this country and after the recession of economic crisis. More specifically, the business performance of all listed companies in the Athens Stock Exchange that made mergers for a recent period of five years (2014–2018) is investigated by analyzing the accounting measures and compared before and after the merger. In addition, sub-samples are created to examine the particular merger characteristics that are assessed with different aspects of managerial past decisions, and compared with the relevant literature. Also, mergers are evaluated periodically based on the time period in which they took place: during the crisis, after its end or without the existence of the economic crisis.

The contribution of the work is located in three issues. First, it contributes theoretically to the limited literature on mergers during period of crisis. Second, on a practical level, it can be a useful guide for those companies that want to make mergers in crisis periods. Finally, it provides a fresh look of the present situation for the Greek capital market where there are a few studies to capture the performance stability after mergers inside and outside of economic crisis periods.

Finally, the structure of the study is as follows: the following section presents the literature review, while the next section presents the research methodology and the examined sample with the various quantitative and qualitative variables. Then, are presented the results and in the last section, the conclusions are stated.

1. Literature review

Mergers and acquisitions are a broad subject of research where different methodologies have been applied over time and are examined from different angles in accounting and finance (Jensen & Ruback, 1983; Manson et al., 1995; Netter et al., 2011; Karampatsas et al., 2014; Lebedev et al., 2014; Triantafyllopoulos & Mpourletidis, 2014; Sun et al., 2017; Dimopoulos & Sacchetto, 2017; Ibrahim & Raji, 2018; Tanna & Yousef, 2019; Tampakoudis & Anagnostopoulou, 2020; Rodionov & Mikhalchuk, 2020). However, it is generally accepted that the ability of a researcher to express an opinion on a subject of study is a direct function of the fact that it is certified by an existing and reliable. Consequently, the methodology followed determines the prestige of his final achievement that he demonstrates methodology (Chatterjee & Meeks, 1996; Pazarskis et al., 2014). Based on these assumptions, we can say that over time, various methodologies have been developed to capture the profitability of merger activities, through merger studies that periodically examine a sample of companies, whether or not there was a profit for the shareholders of the parties involved in merger (Bruner, 2002; Meglio & Risberg, 2011; Golubov et al., 2013; Grigorieva, 2020). Depending on the size of the sample of companies to be examined, the applied methodologies are divided into case studies and large sample studies that aim to draw a new or more general conclusion about the current business situation.

To begin with, the first case (case studies or clinical studies) examines a small number of examined companies (one or at most five companies) with different general methodologies (financial statements' examination, event study, etc.), but there is the additional possibility of more detailed knowledge and evaluation with more careful study of the particular circumstances that led to them, in addition to financial and accounting historical data or personal individual considerations, which may lead us to in-depth conclusions and interpretations from those that had originally emerged, as additional considerations are considered from a strategic and organizational point of view (Kaplan, 1989; Lys & Vincent, 1995; Ruback, 1983).

In the second case, it is considered a large number of companies examined and examined with various general methodologies. These ones can be summarized in three main categories: (i) surveys of executives, (ii) event studies, (iii) accounting studies. From these, the first two rely more on the objective observation and examination of real data and elements, while the third relies more on the acceptance and examination of the subjective perception of managers' human characters. Finally, all of the above could also be combined (Mueller, 1980; Kumar, 1984; Healy et al., 1992; Golubov et al., 2013; Grigorieva, 2020). Next, these three methods are described in details:

The methodology of surveys of executives is recommended and applied by examining senior business executives either through interviews or through questionnaires. In this case,

the researcher must either be experienced enough to accurately diagnose the type of answers in a structured interview conducted mainly with senior executives or to construct a questionnaire where he will receive explicit answers to the questions he asks without hesitation and beyond doubts of any kind, because many times the questionnaires are sent only in printed form and are not completed in the presence of their author to provide the necessary clarifications. Then, whatever data emerges, is recorded, a statistical analysis is performed, from which the final results are derived (Bruner, 2002).

On the other hand, event studies employ as a methodology the assessment of the reaction of the share price from the announcement of various corporate events, and in our case the announcement of the merger event. In this category firstly the performance, before and after the merger, is recorded. Then, the difference in the share prices of the companies is evaluated based on the previously expected performance, which would have been without the merger event. The difference between the actual and expected price indicates the magnitude of the change in the share price, and in other words, it shows the positive or negative outperformance resulting from the announcement of the corporate event of the merger. Finally, since the early 1970s there has been a significant application and use of the business case study in many studies, despite objections to its weaknesses (Caves, 1989). The popularity of event studies that examine the effect of mergers on the share price of companies involved in mergers has continued and is an important method of evaluating the success of mergers (Moeller et al., 2004; Fu et al., 2013; Rao-Nicholson & Salaber, 2013; Golubov et al., 2013; Hu et al., 2016; F. Tao et al., 2017; Young Chae et al., 2018; Zhang et al., 2018; Tampakoudis et al., 2018; HaiYue et al., 2019; Cheng, 2019; Kyei-Mensah, 2019; Chen et al., 2020).

Last but not least, accounting studies examine mergers and their success in relation to their impact on financial statements (Healy et al., 1992; Chatterjee & Meeks, 1996; Ramaswamy & Waegelein, 2003; Thanos & Papadakis, 2012; Pervan et al., 2015; Rao-Nicholson et al., 2016; Abdou et al., 2016; Cui & Chi-Moon Leung, 2020; Abdelmoneim & Abdelrahman Fekry, 2021; Lois et al., 2021). That is, a comparison is made of the operating performance and profitability of the companies involved in mergers either with their different accounting measures or with ratios extracted from their financial statements. More specifically, this methodology is recommended and applied by examining the recorded financial accounting data and analyzes the balance sheets, accounting measures, financial ratios, etc. of the absorbing companies before and after a merger transaction, in order to investigate the change in their operating performance and profitability. What this methodology usually studies are changes in net income, in return on equity, return on investment, earnings per share, the degree of use of loans or debt and liquidity (Healy et al., 1992; Yeh & Hoshino, 2002; Ramaswamy & Waegelein, 2003; Pantelidis et al., 2018; Lois et al., 2021). The examination of the data can be done either by recording and comparing the actual data with a comparison of the industry mean (to which the company belongs) or the most important company in the industry, etc. (Bruner, 2002; Sharma & Ho, 2002). Finally, any comparison of data can be done by comparing two samples of companies, companies that made mergers and companies that did not merge, to draw useful conclusions (Mueller, 1985; Ravenscraft & Scherer, 1987; Dickerson et al., 1997).

Regarding the advantages and disadvantages for accounting studies, as their advantages are the reliability they present, as the various financial statements have been audited and certified in terms of their content, and the clear wording of business performance and the course that emerges from them and that is of particular interest to investors (Mueller, 1980; Pazarskis et al., 2014, 2021). Their weaknesses include the possibility of incomparable data over time, as companies may change their recording methods or different government tax practices or different data apply across countries, the fact that often not included in the financial statements or value of various intangible assets by the company that creates it over time (goodwill), also the fact that they are affected by the existence of mainly high inflation and finally the possibility of illegal alteration of financial statements from the executives of a company (Chatterjee & Meeks, 1996; Bruner, 2002; Bhabra et al., 2013; Dargenidou et al., 2016).

There have been numerous accounting studies over time. What they usually study are changes in net income, ROE, ROA, earnings per share, etc. In general, as shown in the sample survey below, many researchers believe that the most common outcome in terms of the value of the investment of the shareholders of a company after mergers or acquisitions by a company is the reduction of value of their investment (Utton, 1974; Meeks, 1977; Kumar, 1984; Mueller, 1985; Kusewitt, 1985; Dickerson et al., 1997). Also, in smaller percentages, other researchers believe that either the mergers increase the value of the shareholders' investment (Cosh et al., 1980; Chatterjee & Meeks, 1996) or it remains unchanged (Healy et al., 1997). Next, several influential studies are presented for the US and UK market.

For the United States (US) capital market, Mueller (1980) studied 287 mergers in the US during the period 1962–1972. He used the ratios ROE, ROA and ROC of the companies involved as a comparison of pre- and post-merger period, also comparing them with those of other companies not involved in mergers. The conclusion was that the companies involved in the mergers were less profitable than others in the same industry that did not merge. Similar conclusions existed when the same methodology was applied to a sample of companies in various European countries selectively (Belgium, Germany, France, Netherlands, Sweden, UK). Also, Mueller (1985) five years after the above research, published another study with a similar methodology, but with a sample of the thousand largest companies in the United States involved in mergers (either horizontal or conglomerate) during the period 1950–1972 and a control sample of companies in the same sector for each of them. The aim of this research was to study the effect from mergers on the market share of the companies involved. Mueller (1985) claimed that due to the mergers the sample companies recorded significant losses in market shares where they operated, compared to the companies that were in the control sample.

Healy et al. (1992) studied the fifty largest mergers in the US. Their sample concentrated over the period 1979–1984 and Healy et al. (1992) found a significant improvement in the current ratio, but no increase in the net margin or net profit ratio of the companies involved. Also, this improvement of the current ratio that Healy et al. (1992) recorded on average for their sample, it did not come from the one quarter of the sample of the companies as their current ratio and liquidity had deteriorated. Also, Healy et al. (1997) in another study for the same sample and for the same period of time as the previous argued that merger-involved companies had increased operating cash flows as a result of the combined activities of the

merging companies. However, Healy et al. (1997) supported that in no case their profit was greater than the price paid for each merger, and thus, they claimed that any merger activities they studied were essentially zero net present value (NPV) investment activities.

Ravenscraft and Scherer (1987) investigated 471 cases of mergers in the United States for the period 1950–1977. Ravenscraft and Scherer (1987) concluded that the profitability of the companies involved in merger activities was barely above the control group levels over the three years 1975–1977, and even in the best year 1977, it was much lower than the average pre-merger levels. Salter and Weinhold (1979) looked at US-based acquisitions over time. Their research found that, on average, the ROI for acquisitions was 44% below the average for the corresponding period for all listed companies on the New York Stock Exchange, while the corresponding ROA was below 75% respectively. Kusewitt (1985) looked at 138 cases of US companies that had 3,500 acquisitions and mergers for ten years (1967–1976). Kusewitt (1985) found that the ROA of the acquiring companies was significantly reduced and there was a negative correlation between this and the increase in the size of the acquired company.

For the United Kingdom (UK), Cosh et al. (1980) studied 290 mergers in the UK as to their final result during the period 1967–1969. In the selected sample Cosh et al. (1980) examined the profitability with the ROE ratio in the absorbing companies in relation to a control sample of non-involved companies in mergers. The conclusion of their research was that the profitability of the merger-involved companies improved significantly after three years and after five years, immediately after any merger action in relation to the non-companies involved in the mergers. Meeks (1977) studied 233 mergers in terms of their final result during the period 1964–1972 for the UK. In this sample it examined the return on investment of business performance in absorbing companies. Overall and by a very large percentage, he found that ROA deteriorated significantly in the following years immediately after any merger action relative to the industry average. More specifically, merger profits are declined from -5.3% the year after merger to –7.3% seven years post-merger.

Kumar (1984) examined 354 mergers in the UK as to their final result during the period 1967–1974. In the selected sample, he examined the profitability with the ROE index in the absorbing companies in relation to the average of the respective sector. By and large, Kumar (1984) found that the profitability of the companies involved deteriorated significantly after three years, immediately after any merger action relative to the industry average. More specifically, merger profits are declined from –10% the year after merger to –7% seven years post-merger. Utton (1974), also for the UK market, examined 39 mergers in the period 1954-1965 and argued that the percentage of firms with below median profitability was 58% both one and two years after merger.

Dickerson et al. (1997) investigated for thirty years (from 1948 to 1977) in the UK market 613 companies with acquisitions or mergers. In this survey, Dickerson et al. (1997) concluded that the ROA of the acquiring companies in the first five years after the transaction was 2% lower than the corresponding other UK companies not involved in mergers or acquisitions. Chatterjee and Meeks (1996) also examined in the UK market 144 merger activities for the period 1977–1990 (exactly after the previous study's examined period). With this research, Chatterjee and Meeks (1996) claimed that there was not any change in the profitability of companies for the period 1977–1984. But they stated that this situation was different and

change for the merger events during the period 1985–1990 (the rest of their research period), where it exists a significant improvement in the profitability of the companies involved of 13% to 22%, which is attributed mainly to changes in UK tax policy.

To sum up, as for the effect of the mergers and whether they are good for a company that chooses to merge, there have been many other views than the above over time: some researchers again consider that there is a positive result or value creation after mergers (Lang et al., 1989; Netter et al., 2011; Dargenidou et al., 2016; Alhenawi & Stilwell, 2017; Gupta et al., 2021), some others claim a negative one or a decrease in business performance, profitability or additional leverage for the merged companies (Pawaskar, 2001; Yeh & Hoshino, 2002; Harford et al., 2009; Bhabra & Huang, 2013; Jandik & Lallemand, 2014; Harrison et al., 2014) and other researchers supports a pattern familiar to the previous literature: no significant change from mergers in the performance of the merger-involved companies (Healy et al., 1992; Ghosh, 2001; Sharma & Ho, 2002; Al-Hroot, 2016; Pantelidis et al., 2018).

2. Research design

2.1. Sample selection

The preliminary sample for the empirical component of this study is made up of all publicly traded firms in Greece, with the reporting period spanning from 2014 to 2018. This preliminary sample includes the merged companies with annual financial statements during the economic crisis in Greece, after the turmoil of the economic crisis and up to its end, as well as the new era, which follows the end of the economic crisis. Furthermore, the companies that merged more than once in the preceding and subsequent years, or were in the process of bankruptcy were excluded from the analysis, as they could not provide a full set of accounting information (Sharma & Ho, 2002; Pantelidis et al., 2018; Lois et al., 2021). Also, were omitted from the sample some companies that are in highly regulated sectors such as firms that predominantly involved in financial activities (for example, banks) or public utilities (Hoshino, 1982; Sharma & Ho, 2002; Netter et al., 2011; Pazarskis et al., 2014; Alhenawi & Stilwell, 2017; Brahma et al., 2018). As a result, the survey's final sample consists of forty-one companies listed on the Athens Exchange that merged with other listed or unlisted companies between 2014 and 2018.

This sample size is enough satisfactory compared to past research on mergers done in substantially bigger capital markets such as in the United States (Healy et al., 1992: $n = 50$; Clark & Ofek, 1994: $n = 38$), the United Kingdom (Utton, 1974: $n = 39$; Manson et al., 1995: $n = 38$), Japan (Hoshino, 1982: $n = 15$), India (Pawaskar, 2001: $n = 36$), Australia (Sharma & Ho, 2002: $n = 36$), or in six countries at the ASEAN (Association of Southeast Asian Nations) region (Rao-Nicholson et al., 2016: $n = 57$), where n is the examined number of companies that constitutes the sample in each study. The survey sample firms' accounting information was hand collected from the Athens Exchange website, as well as from publicly available financial statements and annual reports on the internet. The percentage rate and number of mergers by year is tabulated in Table 1.

Table 1. Number and percent of mergers by year

Year of the merger event	Number of mergers (*n*)	Percentage per year (%)
2014	7	17.07%
2015	10	24.39%
2016	9	21.95%
2017	9	21.95%
2018	6	14.64%
Total	41	100.00%

2.2. Qualitative variables (merger characteristics)

In order to evaluate the risk level in mergers from several business characteristics, the study introduces in this examination three qualitative variables as risk factors and one specific variable for the examined time period as risk factor, inside and outside of economic crisis periods (Lev & Mandelker, 1972; Amihud & Lev, 1981; Furfine & Rosen, 2011). More specifically, we examine the industry type, the merger combination of merged companies and the industry relatedness in order to find if there is a better performance according some business past decisions (Lewellen, 1971; Amihud & Lev, 1981; Tanna & Yousef, 2019). For example, regarding the industry relatedness of the merged firms for conglomerate mergers and non-conglomerate mergers (thus, horizontal or vertical merger), Ramaswamy & Waegelein (2003) supported with their study that the positive results which are highly related or unrelated to the industry are unclear. A non-conglomerate merger expected to have greater synergy, better overlap and market risk reduction. But conglomerate mergers may lead to risk diversification and higher profits.

The qualitative variables of the study with their analysis are listed below in Table 2:

- the *industry type* of the absording firm: 1 = trade, 2 = industry, 3 = tourism and services, 4 = construction;
- the *merger combination*: 1 = horizontal merger, 2 = vertical merger, 3 = concentric or congeneric merger, 4 = conglomerate merger;
- the *industry relatedness* of the merged firms: 1 = conglomerate merger, 2 = non-conglomerate merger;
- the relation of merger deal to the *period of the economic crisis*: 1 = years 2014 to 2015 (in the middle of the economic crisis), 2 = year 2016 (after the turmoil of the economic crisis), 3 = years 2017 to 2018 (new era, following the end of the economic crisis).

Based on the examined data, the following qualitative data were obtained from the sample:

- 19.51% of the companies belong to the trade sector, 31.71% are industrial companies, 21.95% are tourism companies or companies in the services sector and 26.83% belong to the construction sector;
- from the forty-one companies that are the sample of the survey 29.27% made a horizontal merger, 26.83% a vertical merger, 21.95% a concentric merger and 21.95% a conglomerate merger;

– 60.98% show industry relatedness of the merged firms, while 39.02% made unrelated or conglomerate mergers;
– last, many mergers took place during the period of economic crisis (41.46%), while 21.95% took place at the end of it and 36.59% took place in a period when there was no economic crisis.

Table 2. Summary of qualitative variables of the sample firms

Qualitative variables	1	%	2	%	3	%	4	%
Industry Type	8	19.51%	13	31.71%	9	21.95%	11	26.83%
Merger combination	12	29.27%	11	26.83%	9	21.95%	9	21.95%
Industry relatedness	25	60.98%	16	39.02%	–	–	–	–
Period of the economic crisis	17	41.46%	9	21.95%	15	36.59%	–	–

More analytically, regarding the morphology of mergers and time period of the research sample (considering the impact of the economic crisis from the beginning to its end), at the first examined period (years 2014 to 2015 that are in the middle of the economic crisis) are observed the following. For the industry type, 5.88% of the companies belong to the trade sector, 47.06% are industrial companies, 29.41% are tourism companies or companies in the services sector and 17.65% belong to the construction sector. Considering the merger combination on the sample of the survey 35.29% made a horizontal merger, 35.29% a vertical merger, 17.65% a concentric merger and 11.77% a conglomerate merger. 70.59% of the merged firms show vast industry relatedness, while 29.41% made unrelated or conglomerate mergers.

At the second time-frame period (year 2016, after the turmoil of the economic crisis), the industry type that are evaluated in the sample are: 33.33% of the companies belong to the trade sector, 33.33% are industrial companies, 22.23% are tourism companies or companies in the services sector and 11.11% belong to the construction sector. Also, at the second time period 11.11% of the companies made a horizontal merger, 11.11% a vertical merger, 44.45% a concentric merger and 33.33% a conglomerate merger. Industry relatedness is divided in two almost similar subsamples of companies: 44.45% show industry relatedness of the merged firms, while 55.55% made unrelated or conglomerate mergers.

In the last period of the research sample (years 2017 to 2018, new era following the end of the economic crisis), the majority of sample companies for the industry type fall in the construction sector (46.67%), while 26.67% of the companies belong to the trade sector, 13.33% are industrial companies, 13.33% are tourism companies or companies in the services sector. As for the merger combination of the sample companies, 33.33% made a horizontal merger, 26.67% a vertical merger, 13.33% a concentric merger and 26.67% a conglomerate merger. Regarding industry relatedness, 60% of the companies in this period show high industry relatedness of the merged firms, while 40% made unrelated or conglomerate mergers.

Last, analytical presentation of the qualitative variables of the study is following in the table at the Appendix with the number of firms per year according to the period of the economic crisis, the industry type, the merger combination and the industry relatedness.

2.3. Quantitative variables (accounting measures and ratios)

Quantitative variables of the study are several basic accounting measures and ratios extracted from financial statements of the sample firms (Utton, 1974; Ravenscraft & Scherer, 1987; Healy et al., 1992; Chatterjee & Meeks, 1996; Pawaskar, 2001; Yeh & Hoshino, 2002; Ramaswamy & Waegelein, 2003; Harrison et al., 2014; Abdou et al., 2016; Q. Tao et al., 2017; Pantelidis et al., 2018; Aggarwal & Garg, 2019; Abdelmoneim & Abdelrahman Fekry, 2021). More specifically, accounting measures are: total assets; shareholders funds; total liabilities; sales; net income. The employed ratios are the following: return on equity (ROE); return on assets (ROA); profit margin; total liabilities to sales ratio; debt ratio; equity to debt ratio; solvency ratio; asset turnover ratio, which the majority of them have been extensively applied in many past studies (Salter & Weinhold, 1979; Cosh et al., 1980; Mueller, 1980; Kumar, 1984; Healy et al., 1992; Sharma & Ho, 2002; Thanos & Papadakis, 2012; Rao-Nicholson et al., 2016). All these accounting information is presented with their definitions and calculations in Table 3.

Table 3. Classification of accounting measures and ratios (quantitative variables)

Variables	Accounting Measures / Ratios	Calculations
ACCM01	Total assets	Total assets
ACCM02	Shareholders funds	Shareholders funds
ACCM03	Total liabilities	Total liabilities
ACCM04	Sales	Sales
ACCM05	Net Income	Net Income
RATIO01	Return on equity (ROE)	Net Income / Shareholders funds
RATIO02	Return on assets (ROA)	Net Income/ Total assets
RATIO03	Profit Margin	Net Income / Sales
RATIO04	Total liabilities to sales ratio	Total liabilities / Sales
RATIO05	Debt ratio	Total liabilities / Total assets
RATIO06	Equity to debt ratio	Shareholders funds / Total liabilities
RATIO07	Solvency ratio	Shareholder funds / Total assets
RATIO08	Asset turnover ratio	Sales / Total assets

2.4. Methodology

The study analyzes the performance of the sample firms that were absorbing companies in mergers for one year before and after the merger using numerous ratios-accounting measures. These measures show how the firm is doing regarding various parts of business performance, such as profitability, liquidity, capital structure (Lev & Mandelker, 1972; Salter & Weinhold, 1979; Mueller, 1980; Chatterjee & Meeks, 1996; Abdou et al., 2016; Rao-Nicholson et al., 2016; Q. Tao et al., 2017; Pazarskis et al., 2021). The mean from the sum of each quantitative variable is computed and further compared with t-tests in different subsamples of pre- and post-merger period. The mean of a data set is widely adopted in the relevant

literature of depicturing the impact from mergers and acquisitions (Al-Hroot, 2016; Pantelidis et al., 2018; Aggarwal & Garg, 2019; Gupta et al., 2021; Lois et al., 2021). However, in order to avoid mean's various limitations and verify the received results from mean's analysis, the study computes the median too from the sum of each accounting measures and financial ratio and employs a non-parametric test, Mann-Whitney test, for median comparisons (Mueller, 1980; Cosh et al., 1980; Sharma & Ho, 2002). The study applies the Healy et al. (1992), Sharma and Ho (2002), and Ramaswamy and Waegelein (2003) methodologies to determine if a merger is advantageous. Furthermore, the performance of the sample firms is compared for the same period with the relevant performance of a control sample of firms with no merger events, which were created according their industry type, profitability and capital structure. For unequal variances, we also utilize two independent mean t-tests from samples' comparisons.

Then we examine the relationship between changes in the acquirer's accounting performance following mergers. This is done based on the selected four merger characteristics as evaluated risk factors (the period of the economic crisis, the industry type, the merger combination and the industry relatedness) by applying a modified methodology of Francis and Martin (2010), Hummel and Amiryany (2015) and Rao-Nicholson et al. (2016). Thus, for the variables ACCM01 to ACCM05 and RATIO01 to RATIO08, the change from merger in accounting performance is calculated as the change from the value after the merger minus the value before the merger (for example, $\Delta ACCM01 = ACCM01_{post} - ACCM01_{pre}$). Following that, we classify these merger characteristics into two or more sub-categories based on their various merger risks. Because the data sample does not have a normal distribution, the study applies the Kruskal-Wallis test for each of the examined risk factors, which does not need the data to be normal and instead utilizes the rank of the data values (Pazarskis et al., 2014; Pantelidis et al., 2018; Lois et al., 2021).

3. Results

3.1. Results for research sample and control sample

Initially, the performance of the companies of the sample has been compared with those of the control sample for the post-merger period, using the mean with t-tests (see Table 4a). In the thirteen accounting measures (variables ACCM01 to ACCM05 and RATIO01 to RATIO08) examined, statistically significant changes are observed in four financial ratios-variables: RATIO01, RATIO02, RATIO05, RATIO07. The variable RATIO01, which calculates the return on equity – ROE (net income to shareholders funds), is improved for the companies that made mergers for the examined period, while the companies that did not make mergers show a negative result ($p < 0.1$). The variable RATIO02, which calculates the return on assets – ROA (net income to total assets), is improved for the companies that made mergers and show profits, while the companies that did not make mergers show losses ($p < 0.01$). The variable RATIO05, which calculates the debt ratio (total liabilities to total assets), seems to be better for the companies that made mergers and show lower borrowing than the total capital, while the companies that did not make mergers show higher borrowing based on

capital employed ($p < 0.05$). Finally, the variable RATIO07, which calculates the solvency ratio (shareholders funds to total assets), seems to be improved for the companies that made mergers and show an increase in equity in relation to the total funds, while the companies that did not make mergers show decrease in equity in proportion to total employed capital ($p < 0.05$). Similar results are received by employing the median for the comparisons with Mann-Whitney tests (see Table 4b).

These results of the study are similar to some past studies. Cosh et al. (1980) concluded that the profitability of the merger-involved companies improved significantly after three years and after five years, immediately after any merger action in relation to the non-companies involved in merger deals.

Also, these results are different to some other past studies that found a deterioration of the sample companies' performance to this one from the control sample companies. Dickerson et al. (1997) concluded that the ROA of the acquiring companies in the first five years after the transaction was 2% lower than the corresponding other UK companies not involved in mergers or acquisitions. Meeks (1977) found that ROA deteriorated significantly in the following years immediately after any merger action relative to the industry average. Mueller (1980) concluded that the companies involved in mergers were less profitable than others in the same industry that did not merge. Kumar (1984) found that the profitability of the companies involved deteriorated significantly after three years, immediately after any merger action relative to the industry average.

Table 4a. Comparison results (with mean) of merged and non-merged firms (sample and control sample)

Variable	Mean Merged	Mean Non-Merged	*t*-value	*p*-value	95% CI
ACCM01	839	882	–0.14	0.886	(–629; 545)
ACCM02	322	330	–0.07	0.947	(–250; 234)
ACCM03	518	552	–0.18	0.858	(–414; 345)
ACCM04	502	455	0.28	0.783	(–295; 390)
ACCM05	10.1	4.5	0.54	0.590	(–14.8; 25.9)
RATIO01	0.025	–0.245	1.76	0.085*	(–0.039; 0.580)
RATIO02	0.0165	–0.0249	3.09	0.003***	(0.0147; 0.0682)
RATIO03	0.037	–0.21	1.41	0.167	(–0.105; 0.591)
RATIO04	1.37	2.47	–0.96	0.341	(–3.41; 1.21)
RATIO05	0.598	0.736	–2.07	0.042**	(–0.2714; –0.0054)
RATIO06	1.15	0.697	1.44	0.154	(–0.174; 1.076)
RATIO07	0.402	0.264	2.07	0.042**	(0.0054; 0.2714)
RATIO08	0.619	0.603	0.26	0.797	(–0.1073; 0.1394)

Notes: 1. The amounts of variables ACCM01-ACCM05 are in millions of euros.
2. ***, **, * indicate rejection of the null hypothesis at a significance level of 0.01, 0.05, 0.1, respectively.

Table 4b. Comparison results (with median) of merged and non-merged firms (sample and control sample)

Variable	Median Merged	Median Non-Merged	*p*-value	95% CI
ACCM01	301.0	207.0	0.799	(–96.9; 151.0)
ACCM02	99.0	39.0	0.196	(–16.9; 84.9)
ACCM03	186.0	179.0	0.707	(–129.9; 77.1)
ACCM04	108.0	113.0	0.882	(–82.0; 56.9)
ACCM05	1.00	–0.23	0.107	(–0.57; 11.55)
RATIO01	0.0435	0.0206	0.041**	(0.0016; 0.1104)
RATIO02	0.0194	–0.0025	0.005***	(0.0065; 0.0466)
RATIO03	0.0226	–0.0050	0.010***	(0.0079; 0.0969)
RATIO04	1.1667	1.2340	0.455	(–0.4486; 0.1768)
RATIO05	0.5769	0.7577	0.055*	(–0.2338; 0.0031)
RATIO06	0,7333	0.3197	0.055*	(–0.0049; 0.5284)
RATIO07	0.4231	0.2423	0.055*	(–0.0031; 0.2338)
RATIO08	0.6169	0.5556	0.799	(–0.0937; 0.1476)

Notes: 1. The amounts of variables ACCM01-ACCM05 are in millions of euros.
2. ***, **, * indicate rejection of the null hypothesis at a significance level of 0.01, 0.05, 0.1, respectively.

Next, the performance of the sample companies is analysed (see, next table), comparing their pre-merger performance with that after the merger event, employing the mean with *t*-tests (see Table 5a). By examining all the thirteen accounting measures (variables ACCM01 to ACCM05 and RATIO01 to RATIO08), the study does not find any statistically significant changes over these. As the first results support statistically significant changes of the sample companies in comparison to control sample, it was expected to reveal a better accounting performance for the companies with mergers. However, this signalize that in crisis period or shortly after crisis maybe merger be the only way to survive and provide a stable profitability and accounting performance for shareholders. This can be easily explained by the fact that in times of crisis there is no room for wrong decisions.

The results of this study support that the performance subsequent of mergers is not significantly different for the merged companies and is similar with other past studies (Cosh et al., 1980; Chatterjee & Meeks, 1996; Healy et al., 1992; Ghosh, 2001; Sharma & Ho, 2002; Al-Hroot, 2016; Pantelidis et al., 2018). In addition, these results are in contrast with several other past studies that found an improvement or value creation after mergers (Utton, 1974; Meeks, 1977; Kumar, 1984; Mueller, 1985; Lang et al., 1989; Netter et al., 2011; Dargenidou et al., 2016; Alhenawi & Stilwell, 2017; Gupta et al., 2021) or a decrease in business performance, profitability or additional leverage for the merged companies (Dickerson et al., 1997; Pawaskar, 2001; Yeh & Hoshino, 2002; Harford et al., 2009; Bhabra & Huang, 2013; Jandik & Lallemand, 2014; Harrison et al., 2014). Furthermore, almost the same results are received using the median for the comparisons with Mann-Whitney tests (as are tabulated in Table 5b).

Table 5a. Comparison results (with mean) of mergers with pre- and post-analysis of the sample firms

Variable	Mean Pre-Merger	Mean Post-Merger	*t*-value	*p*-value	95% CI
ACCM01	810	839	0.09	0.926	(–604; 663)
ACCM02	299	322	0.19	0.850	(–211; 256)
ACCM03	510	518	0.03	0.972	(–410; 425)
ACCM04	481	502	0.11	0.915	(–373; 416)
ACCM05	–3.3	10.1	1.39	0.167	(–5.71; 32.38)
RATIO01	0.014	0.025	0.26	0.797	(–0.0771; 0.10)
RATIO02	0.0011	0.0165	1.49	0.139	(–0.0051; 0.0359)
RATIO03	–0.011	0.037	1.33	0.187	(–0.0234; 0.1181)
RATIO04	1.28	1.37	0.39	0.700	(–0.384; 0.570)
RATIO05	0.594	0.598	0.07	0.943	(–0.1044; 0.1123)
RATIO06	1.17	1.15	–0.06	0.954	(–0.774; 0.731)
RATIO07	0.406	0.402	–0.07	0.943	(–0.1123; 0.1044)
RATIO08	0.629	0.619	–0.15	0.880	(–0.1429; 0.1227)

Notes: 1. The amounts of variables ACCM01-ACCM05 are in millions of euros.
2. ***, **, * indicate rejection of the null hypothesis at a significance level of 0.01, 0.05, 0.1, respectively.

Table 5b. Comparison results (with median) of mergers with pre- and post-analysis of the sample firms

Variable	Median Pre-Merger	Median Post-Merger	*p*-value	95% CI
ACCM01	219.0	301.0	0.846	(–102.1; 169.1)
ACCM02	90.0	99.0	0.799	(–39.9; 59.8)
ACCM03	148.0	186.0	0.886	(–69.0; 103.0)
ACCM04	109.0	108.0	0.937	(–50.9; 59.9)
ACCM05	0.29	1.00	0.157	(–1.07; 11.01)
RATIO01	0.0203	0.0435	0.266	(–0.0198; 0.0727)
RATIO02	0.0032	0.0194	0.074*	(–0.0011; 0.0317)
RATIO03	0.0035	0.0226	0.127	(–0.0080; 0.0646)
RATIO04	1.0238	1.1667	0.806	(–0.2560; 0.3169)
RATIO05	0.5806	0.5769	0.967	(–0.1047; 0.1084)
RATIO06	0.7222	0.7333	0.967	(–0.3181; 0.2760)
RATIO07	0.4194	0.4231	0.967	(–0.1084; 0.1047)
RATIO08	0.5641	0.6169	0.867	(–0.1510; 0.1229)

Notes: 1. The amounts of variables ACCM01-ACCM05 are in millions of euros.
2. ***, **, * indicate rejection of the null hypothesis at a significance level of 0.01, 0.05, 0.1, respectively.

3.2. Results for different merger characteristics

Examining the difference in performance (pre- and post-merger) of the sample companies for the industry type (trade, industry, tourism and services, construction) or the period of the economic crisis (years 2014 to 2015, in the middle of the economic crisis; year 2016, after the turmoil of the economic crisis; years 2017 to 2018, new era following the end of the economic crisis) for the merged companies, Table 6 presents the results of this study.

By comparing all the thirteen accounting measures (variables ΔACCM01 to ΔACCM05 and ΔRATIO01 to ΔRATIO08), the study does not find any statistically significant changes for the difference of performance in the industry type (by comparison of pre- and post-merger accounting data). However, this signalize that in crisis period maybe merger have not any negative impact at none industry type (business sector) and lead merged companies to survive in crisis periods, with a stable accounting performance. In contrary, Al-Hroot (2016) claims that each sector which is examined for mergers events could be influenced differently by mergers. Also, Rao-Nicholson et al. (2016) contend that the accounting performance of the acquiring firms in the post-merger period is affected by industry type and claim differences for ASEAN countries.

Furthermore, in the examined accounting measures and regarding the period of the economic crisis, statistically significant changes are observed in four accounting variables: ΔACCM03, ΔRATIO05, ΔRATIO06, ΔRATIO07. The variable ΔACCM03, which calculates the difference in total liabilities (pre- and post-merger), is improved very much for the companies that made mergers after the end of economic crisis and fewer in the new era following the end of the economic crisis ($p < 0.1$). The variable ΔRATIO05, which calculates the difference in debt ratio (total liabilities to total assets), seems to be better for the companies that made mergers especially in years 2017 to 2018, after the crisis ($p < 0.05$). The variable ΔRATIO06 which calculates the difference in equity to debt ratio (shareholders funds to total liabilities) is improved for the companies with mergers during the years after the economic crisis ($p < 0.1$). Finally, the variable ΔRATIO07 which calculates the difference in solvency ratio (shareholders funds to total assets) seems to be improved for the merged companies once again in the period after the crisis period ($p < 0.05$). However, these results are in contrast with some past studies as Rao-Nicholson et al. (2016), which claimed that mergers were related to better performance during the economic crisis period and not out of economic crisis periods.

Table 6. Results from industry type and merger period

ΔVariable	Industry type				Period of the economic crisis		
	trade	industry	tourism & services	construction	1rst period	2nd period	3rd period
ΔACCM01	11.50	0.00	0.00	2.90	0.00	9.00	21.00
ΔACCM02	6.50	0.00	1.00	0.00	0.00	0.00	2.00
ΔACCM03	1.50	0.00	1.00	1.00	0.00*	7.00*	1.00*
ΔACCM04	7.00	1.00	5.00	4.00	1.00	5.00	4.00

End of Table 6

ΔVariable	Industry type				Period of the economic crisis		
	trade	industry	tourism & services	construction	1rst period	2nd period	3rd period
ΔACCM05	4.815	3.00	1.28	6.30	4.00	8.320	3.00
ΔRATIO01	0.0101	0.0011	0.0307	0.0418	0.020	0.0132	0.0328
ΔRATIO02	0.0184	0.00686	0.00687	0.0177	0.00686	0.01606	0.01034
ΔRATIO03	0.02092	0.01031	0.02702	0.05279	0.0180	0.02746	0.05279
ΔRATIO04	0.05789	–0.0433	–0.05369	0.08374	–0.05369	0.07174	0.08696
ΔRATIO05	0.01223	0.0001	0.00439	0.02149	0.000**	0.0372**	–0.0044**
ΔRATIO06	0.00901	0.0001	–0.0133	–0.04775	0.000*	–0.1426*	0.00757*
ΔRATIO07	–0.01223	0.0001	–0.00439	–0.02148	0.000**	–0.037**	0.00438**
ΔRATIO08	–0.01897	0.02778	0.01355	–0.03174	0.01395	0.00174	–0.04202

Notes: 1. The amounts of variables ΔACCM01-ΔACCM05 are in millions of euros.
2. ***, **, * indicate rejection of the null hypothesis at a significance level of 0.01, 0.05, 0.1, respectively.

Regarding the performance of the sample companies for the merger combination (horizontal merger, vertical merger, concentric or congeneric merger, conglomerate merger) or the industry relatedness (conglomerate merger, non-conglomerate merger) for the merged companies, Table 7 presents the results of this study. By comparing all the thirteen accounting measures (variables ACCM01 to ACCM05 and RATIO01 to RATIO08), the study does

Table 7. Results from merger combination and industry relatedness

ΔVariable	Merger combination				Industry relatedness	
	horizontal	vertical	concentric	conglomerate	conglomerate	non-conglomerate
ΔACCM01	13.50	2.00	–3.00	1.00	6.00	–1.00
ΔACCM02	0.000	4.00	0.000	0.000	1.00	0.000
ΔACCM03	5.50	2.00	–1.00	1.00	3.00	–0.50
ΔACCM04	1.50	5.00	12.00	–2.00	2.00	6.50
ΔACCM05	3.815	7.00	0.320	1.140	5.00	0.835
ΔRATIO01	0.03398	0.03074	–0.0042	0.02	0.0322	0.00633
ΔRATIO02	0.00964	0.018	0.00628	0.0068	0.0126	0.00657
ΔRATIO03	0.03688	0.03708	0.01126	0.0103	0.0371	0.01079
ΔRATIO04	0.12694	–0.005	–0.0732	0.07174	0.0717	–0.055
ΔRATIO05	0.01074	–0.00438	–0.00369	0.01209	0.000	0.00436
ΔRATIO06	–0.02387	0.0125	0.0046	–0.05548	0.000	–0.00917
ΔRATIO07	–0.01074	0.00438	0.00369	–0.01209	0.000	–0.00436
ΔRATIO08	–0.01897	0.00312	0.03852	–0.05317	0.000	0.02603

Notes: 1. The amounts of variables ΔACCM01-ΔACCM05 are in millions of euros.
2. ***, **, * indicate rejection of the null hypothesis at a significance level of 0.01, 0.05, 0.1, respectively.

not find any statistically significant changes over these variables. However, this signalize that in crisis period maybe merger with all their different characteristics can lead companies to survive and provide a stable business performance.

The results of this study support that the performance subsequent of mergers is not significantly different from the merger combination or the industry relatedness for the merged companies and is similar with other past studies. In a past research including businesses from multiple south-eastern Asian countries, Rao-Nicholson et al. (2016) proposed that mergers were more gainful during the economic crisis, but there was no evidence of a link between performance and the industry relatedness of the sample companies. Furthermore, these results are in contrast with several other past studies that found positive effects for companies that carry business restructuring through conglomerate mergers (Kusewitt, 1985; Pantelidis et al., 2018) or some other past studies propose extended profits for non-conglomerate mergers. Alhenawi and Krishnaswami (2015) argue that in each of the five years following a merger, excess value is positive for non-conglomerate mergers but negative for conglomerate mergers.

Conclusions

This study examines the merger decisions and its particular characteristics that signalize in literature different levels of risk. The study investigates, from a sample of forty-one listed companies during the Greek economic crisis, various quantitative and qualitative variables of the merger event. The main question is whether mergers have contributed, or not, to business profitability and under which circumstances can lead to better business performance. The study analyzes the accounting performance before and after mergers of the sample companies for the period 2014–2018. The data used to perform the survey were derived from the available financial statements at the website of Athens Stock Exchange and from annual reports published on the website of the examined companies.

The results of the study revealed that the performance subsequent of mergers is not significantly different for the merged companies. In addition, our results support statistically significant changes of the sample companies in comparison to control sample and revealed a stable profitability and a better accounting performance for the companies with mergers. Furthermore, merger events signalize different performance levels during the crisis, Mergers that took place in the period when there was no economic crisis are more profitable and lead to better performance from the mergers in the sub-sample that took place during the period of economic crisis, and thus the improvement has increased when we leave far from the onslaught of crisis. But even in the beginning of crisis, there is observed also positive effects from mergers (than in companies without mergers) and maybe merger be the only way to survive and provide satisfying accounting performance for shareholders. Last, regarding the industry relatedness of the merged firms (for conglomerate mergers and non-conglomerate mergers), the industry type and the merger combination of merged companies, there is not different risk levels or any impact from them on the post-merger performance in these examined accounting data.

The practical part of this study is an advisory and useful tool for companies that plan to merger during crisis periods. In a difficult business arena as signalize any crisis period maybe

merger be the only way to survive and provide a stable profitability and accounting performance for shareholders. Even if mergers include many risks regarding any of merger characteristics, such as the industry relatedness, the merger combination of merged companies, etc., this study proposes that mergers are a safer path to preserve profitability and survive during crisis periods. However, this study has several limitations. The sample of the study include only Greek companies listed and, therefore, did not contain non-listed companies. In addition, the merging transactions between the Greek economic crisis are evaluated with some specific theoretical frameworks that use a particular methodology, as described above, and employ some quantitative variables and specific qualitative variables. Different methodologies with some other variables may lead in different results on this topic.

For future research could be proposed to perform a similar analysis within different time intervals, and included in the sample and companies not listed or from different countries. In addition, in this study the merger effect is examined of one year before and after the completion of merger event. Last, the results on the financial statements may provide different effects from mergers in the long-run, for example, in three years or five years after merger and may differ from these of this study.

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APPENDIX

Table A1. Analytical presentation of qualitative variables broken down by merger characteristics

Number of firms per year	Period of the economic crisis	Industry Type	Merger combination	Industry relatedness
2014 (n = 7)				
1	1	3	4	2
2	1	2	2	1
3	1	4	1	1
4	1	2	2	1
5	1	3	2	1
6	1	4	1	1
7	1	3	3	2
2015 (n = 10)				
1	1	1	3	2
2	1	2	3	2
3	1	3	2	1
4	1	3	2	1
5	1	2	1	1
6	1	4	1	1
7	1	2	4	2
8	1	2	1	1
9	1	2	1	1
10	1	2	2	1
2016 (n = 9)				
1	2	2	4	2
2	2	1	3	2
3	2	3	2	1
4	2	2	3	2
5	2	4	4	1
6	2	3	4	1
7	2	1	1	1
8	2	1	3	2
9	2	2	3	2

End of Table A1

Number of firms per year	Period of the economic crisis	Industry Type	Merger combination	Industry relatedness
2017 (n = 9)				
1	3	1	4	2
2	3	4	2	1
3	3	3	4	2
4	3	2	4	2
5	3	4	2	1
6	3	4	3	2
7	3	4	1	1
8	3	1	1	1
9	3	1	2	1
2018 (n = 6)				
1	3	1	2	1
2	3	3	3	2
3	3	2	4	2
4	3	4	1	1
5	3	4	1	1
6	3	4	1	1