





# “Managerial decisions and accounting performance following mergers in Greece”

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<b>ARTICLE INFO</b>	Panagiotis Pantelidis, Michail Pazarskis, George Drogalas and Stavroula Zezou (2018). Managerial decisions and accounting performance following mergers in Greece. <i>Investment Management and Financial Innovations</i> , 15(1), 263-276. doi: <a href="https://doi.org/10.21511/imfi.15(1).2018.22">10.21511/imfi.15(1).2018.22</a>
<b>DOI</b>	<a href="http://dx.doi.org/10.21511/imfi.15(1).2018.22">http://dx.doi.org/10.21511/imfi.15(1).2018.22</a>
<b>RELEASED ON</b>	Thursday, 15 March 2018
<b>RECEIVED ON</b>	Sunday, 12 November 2017
<b>ACCEPTED ON</b>	Monday, 19 February 2018
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<b>JOURNAL</b>	"Investment Management and Financial Innovations"
<b>ISSN PRINT</b>	1810-4967
<b>ISSN ONLINE</b>	1812-9358
<b>PUBLISHER</b>	LLC “Consulting Publishing Company “Business Perspectives”
<b>FOUNDER</b>	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

**32**



NUMBER OF FIGURES

**0**



NUMBER OF TABLES

**7**

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BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"  
Hryhorii Skovoroda lane, 10, Sumy,  
40022, Ukraine

[www.businessperspectives.org](http://www.businessperspectives.org)

**Received on:** 12<sup>th</sup> of November, 2017

**Accepted on:** 19<sup>th</sup> of February, 2018

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# MANAGERIAL DECISIONS AND ACCOUNTING PERFORMANCE FOLLOWING MERGERS IN GREECE

## Abstract

An investigation was conducted to study a sample of 23 Greek firms listed on the Athens Stock Exchange that underwent mergers from 2011 to 2015, which is a period that embodies the Greek economic crisis. For the investigation, the authors use statistical tests to explore relative changes at twenty accounting ratios of the sample firms. These ratios are computed for one year before and after the merger. These ratios are found to be statistically insignificant indicating firms do not experience a post-merger improvement in accounting performance. The authors also examine six qualitative variables representing merger characteristics as past managerial decisions. Important findings for these characteristics include the following. First, for companies that do not fall under the same production line, the researchers observe an improvement for three ratios: collection period ratio, return on total assets, and profit or loss before tax. Thus, liquidity and profitability are improved. Second, when companies merged with their subsidiaries, the authors discover significant improvement for two ratios: gross margin and collection period ratio. In brief, positive results are found for mergers with subsidiaries and negative results with others. Third, the payment method influences two ratios, the current ratio and the stock turnover ratio. The current ratio is affected positively for the transactions in cash and negatively for the transactions in shares, while the stock turnover ratio is affected negatively for cash transactions and positively for share transactions.

## Keywords

mergers, financial ratios, merger characteristics, Greece economy

## JEL Classification

G34, M40

## INTRODUCTION

The main objective of business management is to increase revenues through expanding company shares in its sector of activity while also simultaneously reducing expenses. Various strategies are implemented to achieve this objective including the development of business plans that aim at mergers and acquisitions (M&As) (Rodionov & Mikhailchuk, 2016). Mergers result from the financial and legal consolidation of companies that can complement one another and increase their competitiveness as a unit (Leepsa & Mishra, 2013; Oruc Erdogan & Erdogan, 2014). Mergers are a business choice that can lead to growth and development and increased profits. Through a firm's acquisition of similar firm's assets, two firms can together achieve their development and performance objectives in their sector of activity. Through acquiring a firm within a different business sector, two firms can also achieve their objectives and enhance performance (Pantelidis et al., 2014; Rao-Nicholson et al., 2016). Globalization has influenced the operation of companies and introduced new competitors to each domestic economy sector. In essence, globalization has forced firms to maintain at least their market share in order to re-

main competitive. The need to stay competitive is one of the main reasons why companies resort to M&As agreements (Oruc Erdogan & Erdogan, 2014). Other reasons that exist for seeking M&A are often associated with socioeconomic conditions of the countries where the firm resides (Rodionov & Mikhalchuk, 2016).

Jensen and Ruback (1983) found that the gains created by corporate takeovers do not appear to come from the creation of market power. They also argued that the negative fallout resulting from post-merger outcomes causes concerns. In particular, firms seeking M&As often overestimate the profits from merger as the expected performance improvements do not occur. Any change in post-merger share prices is usually due to numerous financial factors that are hard to predict such as a synergistic factor (Healy et al., 1992). However, any conclusions deduced only from a share price performance analysis do not provide a clear understanding of the results. In light of the probable incapacity of researchers to understand or even justify their results more convincingly, it becomes imperative to consider more concrete data extracted with the use of accounting information. In order to properly analyze post-merger outcomes, we maintain that accounting information provides a better and safer means of study. This is because accounting information can not only provide a superior gauge of M&A performance, but also better track the changes in performance (Healy et al., 1992; Chatterjee & Meeks, 1996).

The global financial crisis began in the USA in 2008, arising from the uncertainty created by high-risk mortgage loans. This crisis, that caused liquidity problems and quickly expanded to both developed and developing markets, also affected Greece. For example, the annual decrease of 65.5% in the general index of the Athens Stock Exchange (ASE) is a major reference point. This crash occurred due to the liquidation of stocks by investors. The period 2011–2015 is characterized by the shrinking of financial activity, mostly until 2013, while the general index of the ASE fell by 51.9% in 2011 along with a significant decline in the balance sheets of firms. The Private Sector Involvement (PSI), which was imposed the same year, experienced a 50% decrease in bonds. The lack of liquidity in the market not only affected individuals in the following years, but also had severe consequences in the sector of development and investments Annual Report (2011) of the Hellenic Capital Market Commission-HCMC; Pantelidis et al., 2014).

Economic depression reached a peak in 2013 when the funding of systemic Greek banks took place. This funding reduced the climate of uncertainty in the market. After a persistent economic crisis for six years, tourism and the shipping sector led to a stabilizing trend in 2014. The year 2015 saw capital controls that greatly influenced the investment climate (Annual HCMC Report 2013–2015). In a prevailing climate of uncertainty in business and the economy, financial support was provided by the “troika” (European Union (EU), International Monetary Fund (IMF) and European Central Bank (ECB)). Given a united effort towards financial restructuring, capital controls and tax changes, companies were able to face their problems and adapt so as to maintain their position in the domestic and global market and exploit opportunities to increase their market shares.

While firms through the M&As process hope to gain access to new funding that can lead to an increase in profits, the research questions for this study are two-fold. First, we ask whether the acquired firm improved its accounting performance through M&As during a period of economic crisis. Second, in order to delve deeper, we inquire past managerial decisions to find what particular merger characteristics led to a worsened or improved performance (Ghosh, 2001; Ramaswamy & Waeglein, 2003; Rani et al., 2013; Rao-Nicholson et al., 2016). We hope to answer these questions through an analysis of mergers that took place in Greece during 2011–2015, which is a period when Greece was under the supervision of the “troika” (EC, ECB and IMF), was shrinking in financial activity, and was being influenced by the pervasive effect of economic uncertainty (Pantelidis et al., 2014).

The structure of the paper is as follows: section 1 provides the literature review on merger decisions and the hypotheses development. Section 2 describes the characteristics of the examined sample and the research methodology, while section 3 presents the main empirical results of the study. The final section provides our main conclusions.

## 1. RELATED LITERATURE AND HYPOTHESES DEVELOPMENT

### 1.1. Firm accounting performance following mergers

Several studies which have documented positive merger effects (Ramaswamy & Waegelein, 2003; Rani et al., 2013) arrived at the same conclusion when conducting a Du Pont analysis of a sample of 305 Indian companies undergoing M&As from 2003 to 2008. While studying the operating cash flow ratio, Rani et al. (2013) found that a firm's economic situation was enhanced in the post-merger aftermarket. Moreover, the companies were able to demonstrate higher net profits per sales unit after the merger. A main reason for this rise was a reduction in expenses due to economies of scale. Bhabra and Huang (2013) investigated a sample of 136 M&As of Chinese companies listed on the Shanghai and Shenzhen Stock Exchanges during the period 1997–2007. They found that acquirers experience significant positive abnormal stock returns around the announcement date and over the three years after the acquisition.

In contrast to these positive findings, other researchers remain sceptical about the nature of a merger outcome. For example, Oduro and Agyei (2013) offer evidence for a negative post-merger result when investigating an M&A sample from the Ghana Stock Exchange during the period 1999–2010. They found significant deterioration in company profits after the merger compared to the period before. The negative impact on profits was measured based on the Return on Assets (ROA) and Return on Equity (ROE) ratios, which slumped significantly. Thus, a warning can be issued to companies that are involved in M&As, as cautious implementation is needed.

Al-Hroot (2016) offers support for the line of sceptical M&A research when exploring the post-merger economic impact on seven companies in Jordan's

industrial sector during the period 2000–2004. His data analysis of two years prior to and post merger led to the conclusion that there was not a significant improvement in a company's economic situation. In fact, profitability indexes showed minor improvements compared to companies undergoing mergers, albeit the difference was insignificant. Another observation of Al-Hroot (2016) is that each different sector examined was affected differently by their mergers.

While the previously cited Chinese study of Bhabra and Huang (2013) found significant positive stock returns, they also discovered no change in operating performance from the pre- to the post-acquisition period for the acquirers. Two characteristics driving their findings are that the acquirer is often a state-owned firm and often pays in cash. In their study, they used three profitability ratios (Return on Assets, Return on Equity, and profit margin) and discovered profitability for all three ratios, but on lower accounting performance levels in comparison to prior M&As.

Oruc Erdogan and Erdogan (2014) studied the effects of a company's M&A compared to financial indexes using a sample of ten companies from the Istanbul Stock Exchange. They examined data for the five years prior to and after the merger during the period 2004–2005. Their study demonstrates that the basic financial ratios (such as the turnover, net profit margin and leverage ratios) increased in comparison to the period before the merger, but the increase was not significant. More importantly, the working capital and average profitability ratios declined with the latter dropping by 60%, indicating poor accounting performance.

Given the differences in findings among countries outside the Greek domain, our research question focuses on where Greece may stand. Thus, to answer the question about the merger's result in Greece during the period of economic crisis, we formulate our first null hypothesis as:

*H1: The firm accounting performance following mergers of the acquiring firms is not expected to have a relative change during the period of economic crisis in Greece.*

If we can reject this *H1*, we have evidence that Greece is a different case from many countries where no significant differences in accounting performance can be found before and after the merger.

## 1.2. Merger characteristics

### 1.2.1. Merger type

According to Ravenscraft and Scherer (1989), business-related acquisitions fare best relative to non-merged units of similar industry membership and market share, while vertical acquisitions fare least well. Results do not indicate significant differences and it would appear that horizontal, related business, and pure conglomerate acquisitions all experienced profitability declines compared to their high pre-merger levels. In this study, we examine the following four merger types: horizontal; vertical; concentric or congeneric; and conglomerate. Also, our study attempts to investigate the performance of the merger type after the event according to the above categorization. Based on the above discussion, we formulate our second hypothesis as:

*H2: The accounting performance of the merged firms is not affected by merger type of the event (horizontal, vertical, concentric or congeneric, conglomerate) during the period of the economic crisis in Greece.*

### 1.2.2. Industry relatedness of merged firms (conglomerate or non-conglomerate merger)

Many past studies addressed the question of what caused the rise and the motives of conglomerate mergers. Conglomerate merger is considered as the ultimate outcome of a strategy of two or more companies that produce different products or offer different services, aiming at securing a wider economic base, better organization strategy and greater profit opportunities. The logic of diversification to acquire businesses outside their main

line of business proposes the creation of an additional layer of management that undertakes the coordinating function among several divisions. Thus, a well-organized combination could lead a multi-segment firm through diversification to a more efficient decision making process and enhanced performance. Amihud and Lev (1981) conjectured that a conglomerate merger generally leads, through the diversification effect, to reduced risk of the combined entity. Shleifer and Vishny (1991) proposed that firms having excess cash or experiencing positive possibility to issue equity employed conglomerate mergers to avoid antitrust regulation. However, only the proper identification of target firms leads to successful mergers with synergistic potential in domestic or cross-border mergers (Jensen & Ruback, 1983; Rao-Nicholson & Salaber, 2013). In order to examine any potential synergies for conglomerate mergers, the study analyzes accounting performance of the sample firms regarding their industry relatedness and their past managerial decision to acquire a firm in their industry (horizontal or vertical merger) or not (conglomerate merger). This enables us to create our third hypothesis, which is

*H3: Merger effects are not likely to be different for firms within the same industry during the period of economic crisis in Greece.*

### 1.2.3. Industry type of the acquiring firms

Healy et al. (1992) claim that firms perform better in accounting results after a merger compared to non-merged firms, resulting in a differentiation in post-merger performance. Ramaswamy and Waagelein (2003) argue that firms from different sectors, when led to a merger, perform better. Al-Hroot (2016) claims that each sector which was examined for mergers was influenced differently by its mergers. Alexandrakis et al. (2015) and Agorastos et al. (2013) argue that Greek mergers in different business industries lead to differences in profitability and operating efficiency. Pantelidis et al. (2014) examine mergers during the economic crisis in Greece and contend that the accounting performance of the acquiring firms in the post-merger period is affected by industry type. Rao-Nicholson et al. (2016) also claim differences for ASEAN countries.



For this study, we examine the following industry categories: primary sector; construction and commerce; publications firms; IT and communication services; industrial firms; and others. We investigate the performance after the merger event according to the above categorizations. Based on the above categorizations, we postulate our fourth hypothesis, which is:

*H4: The accounting performance of the merged firms is not affected by industry type during the period of economic crisis in Greece.*

#### 1.2.4. Method of payment

Diachronically, various studies have been made on the method of payment in M&As and its impact on the financial statements, as well as on accounting performance (Faccio et al., 2006). In general, payment methods are perceived as: (a) cash payment, (b) share-based payment, and (c) a combination of cash and equity. According to Jensen's (1986) free cash flow theory, the financing method matters to the operating performance of the acquirers. Specifically, debt or cash financed mergers would have lower profits than those financed with equity, because the former would raise the costs of debt and thus decrease profitability (Clark & Ofek, 1994; Manson et al., 1995). Furthermore, Netter et al. (2011) argued that payment by shares of a merger does not always lead to negative future returns for the acquiring company. Another important conclusion drawn by Netter et al. (2011) is that the proportion of cash-swap transactions doubled from 1992 to 2009. In Greece, during the economic debt crisis, Greek firms were faced with a multitude of complex financial problems that are related to the lack of liquidity (Pantelidis et al., 2014).

This study to test the impact of the payment method on the accounting performance analyzes payment method data of our sample firms and categorizes them in two groups: (i) firms that have reached their deal with a stock exchange; and (ii) firms that prefer cash payment for their M&As. This leads to our fifth hypothesis, which is:

*H5: There is no significant difference in post-merger accounting performance for acquiring firms using a different method of pay-*

*ment (cash or stock exchange) during the period of economic crisis in Greece.*

#### 1.2.5. Mergers with their subsidiaries

Rao-Nicholson et al. (2016) suggest that M&As in the ASEAN countries during the crisis seem to manifest no relation between performance and the percentage of target shares acquired. Furthermore, they observed that a large number of firms merged with their subsidiaries. Subsequently, we divide our sample into two groups. They are: (i) those that merged with their subsidiary; and (ii) those that absorbed a firm that was not a subsidiary. Thus, we are able to create our sixth hypothesis, which is:

*H6: There are no significant differences in post-merger accounting performance for firms that merged with their subsidiaries or not during the period of economic crisis in Greece.*

#### 1.2.6. Legal form of the acquired firm

Finally, the sample of firms that we study can be classified in terms of the legal form of the merged entity. This classification will help us to identify the degree of materiality of the legal status during the pre- and post-merger periods. In order to study the impact of the legal form of the acquired company, two categories were formed. They are: (i) Sociétés anonymes-public limited firms (SA); and (ii) limited liability companies (LLC), as acquired-absorbed firms. This leads to our seventh and last hypothesis, which is:

*H7: The accounting performance of the merged firms is not affected by the legal form of the acquired firm during the period of economic crisis in Greece.*

## 2. RESEARCH DESIGN

### 2.1. Sample selection and merger characteristics (qualitative variables)

The preliminary sample of the study includes all listed firms on the Athens Stock Exchange in the period 2011–2015. This five-year period includes

the annual financial statements from the first year of the severe economic crisis in Greece (which is 2011) to the last available year at the time of this writing (which is 2015). We eliminate the following observations from our sample: firms that had more than one merger during our period of study; firms that were in the process of bankruptcy; and firms that were engaged primarily in financial operations (such as banks).

Our final sample consists of 23 listed firms that merged with other listed or unlisted firms. We collected financial data for our sample from the following sources: Athens Stock Exchange website; published financial statements; and annual reports found online. The number and percent of our sample per year is shown in Table 1 where we observe that years 2011 and 2016 had six mergers.

**Table 1.** Number and percent of mergers by year

Year	Number	Percentage, %
2011	6	26.09
2012	3	13.04
2013	4	17.39
2014	4	17.39
2015	6	26.09
Total	23	100.00

Qualitative variables of the study as several merger characteristics of past managerial decisions are listed below:

- the merger type of the event: 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;

**Table 2.** Merger characteristics (qualitative variables) of the sample firms

Firms per year	Merger type	Industry relatedness	Industry type	Method of payment	Previous relation	Legal form of acquired
<b>2011 (n = 6)</b>						
1	1	1	1	2	1	1
2	2	1	2	2	1	1
3	1	1	1	1	2	2
4	1	1	2	2	1	1
5	1	1	1	2	2	1
6	3	2	2	2	1	1
<b>2012 (n = 3)</b>						
1	3	2	2	2	1	1
2	1	1	1	2	2	1
3	3	2	4	2	1	1
<b>2013 (n = 4)</b>						
1	2	1	3	2	1	1
2	2	1	3	2	1	1
3	4	2	2	1	1	1
4	3	2	2	1	1	1
<b>2014 (n = 4)</b>						
1	4	2	2	2	1	1
2	2	1	2	2	1	1
3	3	2	4	2	1	1
4	2	2	2	2	1	2
<b>2015 (n = 6)</b>						
1	2	1	3	2	1	1
2	2	1	2	2	1	1
3	1	1	3	2	2	1
4	1	1	1	2	2	1
5	2	1	3	2	2	1
6	1	1	4	2	2	1

Note: An observation can have more than one characteristic, e.g., a firm could use both methods of payment.

**Table 3.** Classification of financial ratios (quantitative variables)

Variables	Ratios	Ratio definitions
<b>Liquidity ratios</b>		
VAR01	Current ratio	Current assets / Current liabilities
VAR02	Liquidity ratio	(Current assets – Stocks) / Current liabilities
<b>Activity ratios</b>		
VAR03	Collection period	(Debtors / Sales) $\times$ 360
VAR04	Stock turnover	Net sales / Stocks
VAR05	Credit period	(Creditors / Sales) $\times$ 360
VAR06	Sales to current liabilities ratio	Sales / Current liabilities
VAR07	Asset turnover ratio	Sales / Total assets
VAR08	Net assets turnover	Sales / (Shareholders funds + Non-current liabilities)
<b>Capital structure ratios</b>		
VAR09	Debt ratio	Total liabilities / Total assets
VAR10	Debt-equity ratio	Total liabilities / Shareholders funds
VAR11	Solvency ratio	Shareholder funds / Total assets
VAR12	Interest cover	Earnings before interest & taxes / Interest expenses
VAR13	Gearing	Long-term debt / Shareholders funds
<b>Profitability ratios</b>		
VAR14	ROA using before-tax profit or loss	Before-tax profit or loss / Total assets
VAR15	ROE using before-tax profit or loss	Before-tax profit or loss / Shareholders funds
VAR16	ROA using Net income	Net Income / Total assets
VAR17	ROE using Net income	Net Income / Shareholders funds
VAR18	Gross Margin	Gross profit / Sales
VAR19	EBIT Margin	Earnings before interest & taxes / Sales
VAR20	EBITDA Margin	Profit before interest, taxes, & depreciation / Sales

Notes: Stocks are outstanding shares. Shareholder funds are all assets less all liabilities.

- the industry type of the acquiring firm: 1 – primary sector, 2 – industry, 3 – trade services, 4 – construction;
- the method of payment; 1 – cash, 2 – stock exchange;
- the mergers with their subsidiaries with an existence of previous legal business relation and cooperation: 1 – subsidiary, 2 – not subsidiary;
- the legal form of the acquired firm: 1 – SA, 2 – LLC.

The aggregate qualitative data for all sample firms are given in Table 2.

## 2.2. Ratios-quantitative variables

We use financial ratio analysis for investigating our sample in mergers. We choose twenty ratios grouped into four main categories: liquidity ratios; activity ratios; capital structure ratios; and

profitability ratios. While accounting numbers have some shortcomings, they help provide a solid understanding of the financial accounting effects around mergers. Because a merger is a multi-layered event, using a large number of ratios should aid in decoding any effects. Table 3 presents the twenty ratios that serve as indicators to analyze and evaluate mergers and their accounting effects. This table reveals the ratio types with their definitions.

## 2.3. Methodology

The study employs several ratios-accounting measures to analyze the performance of the sample firms that involved in mergers as acquirers for the one year before and after the merger event. These measures indicate different conditions of the firm (e.g., profitability, liquidity, capital structure, etc.). Note that the merger year is excluded from the ratios' calculations, as several factors influence accounting performance for one time during this year, such as the cost of implementing the merger, the cost of integrating information systems, etc.



(Lev & Mandelker, 1972; Healy et al., 1992). The mean from the sum of each ratio is computed instead of the median (Cornett & Tehnarian, 1992; Pantelidis et al., 2014). When trying to ascertain if a merger is beneficial, we follow methodologies of Cornett and Tehnarian (1992), Sharma and Ho (2002), and Pantelidis et al. (2014). In testing  $H1$ , we use two independent samples' mean  $t$ -tests for unequal variances.

For the rest of the hypotheses,  $H2-H7$ , we test the relation between the changes in accounting performance of the acquirer after mergers. This is done based on the six business characteristics by applying a modified methodology of Lev and Mandelker (1972), Ramaswamy and Waagelein (2003) and Francis and Martin (2010) where the change in accounting performance of the acquirer is measured as the change in a ratio ( $\Delta VAR$ ) from the value after the merger minus the value before the merger. Specifically, let  $VAR_1$  be the pre-merger average of a specific measure  $i$  (ratios  $VAR01-VAR20$ ) for an acquiring firm and let  $VAR_2$  be the post-merger average for the same

firm. Thus, the change in accounting performance is measured as:  $\Delta VAR_i = VAR_{2i} - VAR_{1i}$ . Next, we analyze the six merger characteristics by categorizing them in two or more groups according to their different merger characteristics. Because this data sample has not a normal distribution, we use for each of the six characteristics, that form  $H1-H6$ , the Kruskal-Wallis test that does not require the data to be normal and uses the rank of the data values (Pantelidis et al., 2014).

### 3. RESULTS

#### 3.1. Results of firm accounting performance following mergers ( $H1$ )

In Table 4, we present our two-tailed  $t$ -test results for our sample of 23 firms that are listed on the Athens Exchange from 2011 to 2015 and that completed a merger. As seen in this table, we do not find significant statistics when conducting the two independent samples mean  $t$ -tests for the

**Table 4.** Comparison results for 20 ratios from pre- and post-merger period ( $H1$ )

Variables	Mean pre-merger	Mean post-merger	t-value	p-value	Confidential index
VAR01	1.239	1.347	0.54	0.59	(-0.294; 0.511)
VAR02	1.210	1.010	-1.04	0.30	(-0.586; 0.186)
VAR03	164	121.5	-1.38	0.18	(-104.0; 19.7)
VAR04	11.9	15.5	0.39	0.70	(-15.15; 22.26)
VAR05	201	196	-0.13	0.90	(-81.7; 71.9)
VAR06	1.564	2.05	1.32	0.20	(-0.264; 1.24)
VAR07	0.811	0.867	0.24	0.81	(-0.413; 0.525)
VAR08	1.81	2.16	0.59	0.56	(-0.848; 1.547)
VAR09	1.39	0.714	-1.38	0.18	(-1.685; 0.339)
VAR10	34	-0.2	-1.15	0.26	(-96.1; 27.4)
VAR11	0.336	0.306	-0.47	0.64	(-0.1584; 0.0988)
VAR12	6.3	3.09	-0.59	0.56	(-14.34; 7.99)
VAR13	3.5	0.10	-1.09	0.29	(-9.90; 3.05)
VAR14	0.0015	-0.0061	-0.30	0.77	(-0.0591; 0.044)
VAR15	-3.6	0.78	1.19	0.25	(-3.20; 11.88)
VAR16	-0.0093	-0.0113	-0.09	0.93	(-0.0461; 0.0422)
VAR17	-3.8	0.71	1.17	0.25	(-3.46; 12.49)
VAR18	0.209	0.208	-0.02	0.99	(-0.1165; 0.1144)
VAR19	0.0351	0.042	0.21	0.84	(-0.0628; 0.0772)
VAR20	0.089	0.102	0.30	0.76	(-0.0747; 0.101)

Notes: \*\*\*, \*\*, \* indicate that the change of the mean is significantly different from zero at a significance level of 0.01, 0.05, and 0.10, respectively, as calculated by comparing the average of two independent subassemblies (two independent sample mean  $t$ -tests) at ratios of sample. More specifically, for the three above cases the classification levels relative to the value of the p-value are the following:  $p < 0.01$  indicates strong evidence against  $H1$  (denoted by \*\*\*),  $0.01 \leq p < 0.05$  indicates moderate evidence against  $H1$  (denoted by \*\*),  $0.05 \leq p < 0.10$  indicates minimum evidence against  $H0$  (denoted by \*),  $0.10 \leq p$  indicates no real evidence against  $H0$ .

**Table 5.** Results (Kruskal-Wallis test) from the merger type and the industry relatedness ( $H_2$ - $H_3$ )

$\Delta$ Variable	Merger type			Industry relatedness		
	Horizontal	Vertical	Concentric	Conglomerate	Non-conglomerate	Conglomerate
$\Delta$ VAR01	-0.364	0.030	0.226	0.456	-0.171	0.226
$\Delta$ VAR02	-0.525	-0.148	-0.082	0.015	-0.331	-0.082
$\Delta$ VAR03	-4.147	-17.21	-57.34	-34.30	-14.33*	-43.40*
$\Delta$ VAR04	0.497	0.127	-0.558	-2.794	0.303	-1.053
$\Delta$ VAR05	16.52	-4.191	-6.460	84.28	-2.622	6.193
$\Delta$ VAR06	0.133	0.052	0.763	-0.373	0.052	0.163
$\Delta$ VAR07	0.144	0.029	-0.002	-0.326	0.055	-0.022
$\Delta$ VAR08	0.262	-0.482	0.261	-0.687	0.032	0.091
$\Delta$ VAR09	0.034	0.039	-0.034	-0.090	0.034	-0.034
$\Delta$ VAR10	-0.085	-0.286	-0.548	-0.294	-0.087	-0.518
$\Delta$ VAR11	-0.034	-0.056	0.034	0.090	-0.046	0.034
$\Delta$ VAR12	-0.347	-0.010	-0.094	7.506	-0.077	0.437
$\Delta$ VAR13	-0.158	0.120	0.015	-0.167	-0.028	0.015
$\Delta$ VAR14	-0.023	-0.006	0.000	0.056	-0.014*	0.006*
$\Delta$ VAR15	-0.022	-0.011	-0.003	0.078	-0.011	0.012
$\Delta$ VAR16	-0.020	-0.008	0.010	0.026	-0.013*	0.010*
$\Delta$ VAR17	-0.018	-0.012	0.031	0.035	-0.012	0.031
$\Delta$ VAR18	-0.043	0.006	0.089	-0.039	-0.009	0.023
$\Delta$ VAR19	-0.022	0.011	0.090	0.113	-0.015	0.090
$\Delta$ VAR20	-0.029	-0.011	0.027	0.142	-0.022	0.027

Note: \*\*\*, \*\*, \* indicate rejection of the null hypothesis at a significance level of 0.01, 0.05, 0.1, respectively.

twenty measurable ratios that are examined for a year before and a year after the merge.

Our results in Table 4 are similar to those of Healy et al. (1992), Gosh (2001), Sharma and Ho (2002), and Al-Hroot (2016). However, they differ from those who claim an improvement in performance such as Rani et al. (2013) or those who refer to a reduction in firm performance such as Bhabra and Huang (2013), Oduro and Agyei (2013), and Oruc Erdogan and Erdogan (2014).

### 3.2. Results for the different merger characteristics

Next, we investigate our sample with respect to six merger characteristics that represent qualitative variables (as past managerial decisions) were given earlier in Table 2. The performed tests aim to answer several research questions. Firstly, they attempt to examine the correlation of business activities of the firms that took part in the merger as horizontal, vertical, concentric or conglomerate mergers. Secondly, they intend to reveal if there is a correlation of the activity of the merged firms when they are in an identical production line or

not (conglomerate or non-conglomerate merger). Another question is the analysis of the branch of the production of the acquired firm in the merger (primary sector, industry, trade services, construction sector). Moreover, we tested whether or not the absorbed firm was a subsidiary of the acquiring firm and the legal form (SA or limited liability company). Finally, the payment method of the merger was analyzed.

#### 3.2.1. Results from the merger type ( $H_2$ )

Table 5 reports our results when testing merger type. As seen in this table, we find no statistically significant change in any of the twenty ratios. These insignificant findings are similar to prior research that we documented earlier when examining differences in merger types, namely, horizontal, vertical, concentric (congeneric), and conglomerate.

In conclusion, our findings on Greek firms appear to agree with what has been found for other countries. A complete comparison is deemed difficult because of the extent to which our tests differ from similar studies.

### 3.2.2. Results from the industry relatedness of the merged firms ( $H_3$ )

Also from Table 5, we observe that there is a statistically significant change in three out of the twenty ratios that are based on the correlation between the activities of the merged undertakings in terms of whether they are on the same production line or not (conglomerate, non-conglomerate). The variables that had a statistically significant difference are collection period variable ( $\Delta VAR03$ ), before-tax profit and total assets ( $\Delta VAR14$ ), and after-tax profit and total value of assets ( $\Delta VAR16$ ). For each variable, we find  $0.05 \leq p < 0.10$  from the applied test.

For  $\Delta VAR03$ , we find a significant change, which indicates that the time taken to convert its credit sales to cash has fallen for firms with conglomerate mergers. Also, for  $\Delta VAR14$ , we show the before-tax profit to total assets increases from the pre-merger to post-merger period. For  $\Delta VAR16$ , we show that net income (or after-tax profit) increases. All three of these results indicate a positive accounting performance for conglomerate transactions.

Thus, industry relatedness of merged firms, as perceived by the form of conglomerate or non-conglomerate mergers, could be a motive for M&As. Rao-Nicholson and Salaber (2013) claim that the potential of synergies primarily depend on the similarity between the target and acquirer industries. In conflict with this claim, our significant findings provide some evidence that firms can be proficient in assessing their targets through evaluating them as stand-alone organizations. The latter suggests gains in value through synergies at the implementation of M&As.

### 3.2.3. Results by industry category ( $H_4$ )

Table 6 presents the results of our statistical analysis for our tests based on the industry of the acquired firm as divided into the categories of primary sector, industry, trade services, and construction. Regarding the branch where the acquired undertakings belong, we find no statistically significant changes any of our twenty ratios that we tested. Thus, our findings differ from the research described earlier (Rao-Nicholson et al., 2016; Muhammad & Zahid, 2014) that includes a study of Greek mergers during the economic crisis in Greece (Pantelidis et al., 2014).

**Table 6.** Results (Kruskal-Wallis test) by industry and cash or equity payments ( $H_4$ - $H_5$ )

$\Delta$ Variable	Industry category				Method of payment	
	Primary sector	Industry	Trade services	Construction	Cash	Stock exchange
$\Delta VAR01$	-0.407	0.088	-0.320	0.226	1.096*	-0.104*
$\Delta VAR02$	-0.450	-0.148	-0.462	0.188	-0.010	-0.280
$\Delta VAR03$	-12.66	-18.21	-20.58	-100.6	-37.57	-17.21
$\Delta VAR04$	0.622	-0.282	-1.059	0.313	-4.243*	0.273*
$\Delta VAR05$	-3.542	2.246	-6.679	57.43	-6.460	1.600
$\Delta VAR06$	0.274	0.127	-0.008	-0.126	0.163	0.052
$\Delta VAR07$	0.144	-0.009	0.014	-0.002	-0.022	0.034
$\Delta VAR08$	0.262	-0.145	0.031	0.261	-0.287	0.056
$\Delta VAR09$	0.031	-0.025	0.058	0.037	-0.037	0.029
$\Delta VAR10$	-0.391	-0.470	-0.268	0.099	-0.430	-0.169
$\Delta VAR11$	-0.031	-0.006	0.030	-0.037	0.037	-0.034
$\Delta VAR12$	-2.940	0.134	0.751	1.664	0.230	-0.008
$\Delta VAR13$	-0.102	0.027	-0.150	0.015	-0.001	-0.004
$\Delta VAR14$	-0.028	-0.000	-0.017	0.035	0.007	-0.010
$\Delta VAR15$	0.018	-0.002	-0.109	0.058	0.018	-0.012
$\Delta VAR16$	-0.016	-0.003	-0.023	0.036	0.010	-0.009
$\Delta VAR17$	0.006	0.016	-0.097	0.059	0.031	-0.009
$\Delta VAR18$	-0.045	0.016	0.001	0.023	-0.011	0.016
$\Delta VAR19$	-0.029	-0.002	-0.031	0.221	0.015	-0.005
$\Delta VAR20$	-0.030	-0.000	-0.020	0.224	0.001	-0.011

Notes: \*\*\*, \*\*, \* indicate rejection of the null hypothesis at a significance level of 0.01, 0.05, 0.1, respectively.

### 3.2.4. Results for cash or share exchange (H5)

Table 6 reports statistically significant results for two variables, namely the general liquidity index captured by the current ratio ( $\Delta VAR01$ ) and the stock turnover ratio ( $\Delta VAR04$ ). For both variables, we find  $0.05 \leq p < 0.10$  from the applied test.

Regarding the first variable ( $\Delta VAR01$ ), this result indicates that the liquidity of the merged firms was influenced by the option of payment for the merger, whether it was conducted in cash or in shares. We conclude that mergers that were made with cash have better liquidity performance compared to those mergers that exchange shares. Our liquidity result is inconsistent with some researchers (Jensen, 1986; Clark & Ofek, 1994; Manson et al., 1995; Bhabra & Huang, 2013). However, it is consistent with what was stated earlier by Faccio et al. (2006). Our liquidity finding is also in agreement with Ghosh (2001) and Karampatzas et al. (2014) who show better liquidity results in post-merger performance.

Our results for  $\Delta VAR04$  suggest that the payment method of the merger influences the stock

turnover negatively in terms of cash transactions and positively in terms of stock transactions. Our finding for  $\Delta VAR04$  can be compared with Netter et al. (2011) who state that studies have shown that payment by shares for an M&A does not always generate negative future returns for the acquiring company. Our positive results are consistent with this statement and lend further support for the notion that the method of payment used in a merger can be an influential factor to consider.

### 3.2.5. Results for subsidiary or non-subsidary (H6)

Table 7 reports that two of the twenty variables are significant where we find  $0.05 \leq p < 0.10$  from the applied test. The two variables are the collection period ( $\Delta VAR03$ ) and gross margin ( $\Delta VAR18$ ). From  $\Delta VAR03$ , we find that the days of claims are favorably affected by whether the acquisition is a subsidiary or not of the acquirer. Thus, as was found earlier for  $H3$ , we now find for  $H6$  a favorable result because the time taken to convert credit sales to cash has fallen. So twice now, we have found support for an improvement

**Table 7.** Results (Kruskal-Wallis test) based on subsidiary or non-subsidary and legal form of the acquirer ( $H6-H7$ )

$\Delta$ Variable	Subsidiary or not		Legal form of the acquirer	
	Subsidiary	Non-subsidiary	SA	LLC
$\Delta VAR01$	0.083	-0.025	-0.022	0.590
$\Delta VAR02$	-0.211	-0.236	-0.268	-0.010
$\Delta VAR03$	-25.208*	-3.179*	-19.08	15.33
$\Delta VAR04$	-0.005	0.745	0.233	-16.35
$\Delta VAR05$	4.901	-8.575	-1.702	9.765
$\Delta VAR06$	0.163	-0.338	0.091	0.146
$\Delta VAR07$	0.003	0.115	0.014	-1.663
$\Delta VAR08$	0.032	0.750	0.033	-0.615
$\Delta VAR09$	-0.017	0.034	0.025	-4.016
$\Delta VAR10$	-0.430	-0.146	-0.268	-2.208
$\Delta VAR11$	-0.025	0.003	-0.025	-0.395
$\Delta VAR12$	-0.094	0.490	-0.094	0.296
$\Delta VAR13$	0.015	-0.206	0.015	-0.028
$\Delta VAR14$	-0.010	0.021	-0.001	-0.087
$\Delta VAR15$	-0.011	0.038	-0.003	0.004
$\Delta VAR16$	-0.009	0.020	-0.007	-0.038
$\Delta VAR17$	-0.007	0.033	-0.007	0.101
$\Delta VAR18$	0.021*	-0.067*	0.001	0.017
$\Delta VAR19$	-0.007	0.029	-0.007	0.026
$\Delta VAR20$	-0.003	0.020	-0.002	-0.001

Note: \*\*\*, \*\*, \* indicate rejection of the null hypothesis at a significance level of 0.01, 0.05, 0.1, respectively.

in accounting performance through a more favorable collection period result. For  $\Delta VAR18$ , we find an improvement in the gross profit. An important statistical change indicates that gross profit was affected by the merger based on the acquisition being a subsidiary of the acquirer. Finally, both variables provided improved results for mergers of the acquiring firms with subsidiaries.

### 3.2.6. Results based on the legal form of the acquirer (H7)

Our last hypothesis (H7) concerns the terms of the legal form of the merged entity. For this hypothesis, we explore the degree of materiality of the legal status in the pre- and post-merger period. The legal form of the absorbed firms was examined using two categories: Sociétés anonymes-public limited firm (SA) and limited liability companies (LLC). As reported in Table 7, all tests yielded insignificant statistics. Thus, the examined mergers were not influenced by the legal form of the absorbed.

## 3.3. Interpretation of results and discussion

After 2010, Greece has been shocked by the economic crisis. This study examines accounting performance following mergers with financial ratios of Greek firms, for the period 2011–2015, thus during the economic crisis in Greece. On the basis of the research sample and financial ratios, several

merger characteristics as past managerial decisions are examined, in order to identify factors associated with better accounting performance following mergers in a period of economic crisis. The contribution of this work, as revealed by the above findings, can be highlighted in practical terms with some proposals for specific administrative practices and actions and more specifically their usefulness in the findings of the survey for executives and business owners.

To start with, a safer path for better accounting performance in Greece is a merger formation of the acquired firm with its subsidiary. Another reason for better performance could be the fact that merged firms should not be in the same industry and should be active at a different stage in the production process. Finally, the payment method in mergers which is examined presents ambiguous results, and managers or potential investors should be very cautious to achieve accounting gains and should further analyze every target firm, in order to decide on a possible good merger deal.

Although several past studies have produced negative results or even counterproductive conclusions, as is the case for M&As at specific points, there may always be some specific ways that can reduce business failure at any given time. In any case, every business that intends to engage in a merger deal should be particularly careful in order not to have possible negative future impacts on its business performance.

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## CONCLUSION

The present study examines the economic situation based on the accounting performance of 23 Greek firms undergoing mergers during the crisis years from 2011 to 2015. Our examination uses twenty ratios computed from one year prior to and after the merger. For these tests, we find no statistically significant support for either an improvement or deterioration for any of the examined ratios in the post-merger period. This paints a picture that Greek firms undergoing mergers did not experience either business gains or losses after their merger investments.

We also use nonparametric tests to study six merger characteristics that serve as qualitative variables for our sample (past managerial decisions). These characteristics are: the correlation of activity between the acquiring and acquired company; inclusion in different business sectors; selection of the payment method; the criterion of being a subsidiary or not of the acquired firm; and, the legal structure of the acquired company. Three of the six qualitative variables did not manifest a statistically significant change. They are: (1) the categorization regarding the correlation of business activity; (2) the legal structure of the acquired (absorbed) company; and, (3) the activity sector of the acquiring



company. The other three categories demonstrated statistically significant changes in ratios. We describe these below.

First, for companies that do not fall under the same production line, we observe an improvement in three ratios: collection period ratio, return on total assets, and profit or loss before tax. Thus, liquidity and profitability are improved. Second, when companies merged with their subsidiaries, we discover significant improvement in two ratios: the gross margin and the collection period. In brief, we find positive results for mergers with subsidiaries and negative results with others. Third, the payment method influences two ratios, the current ratio and the stock turnover ratio. The current ratio was affected positively for the transactions in cash and negatively for the transactions in shares, while the stock turnover ratio was influenced negatively for cash transactions and positively for share transactions.

In terms of future research, we recommend the following investigations. First, research should pursue a ratio analysis of unlisted Greek companies so this can be compared to our results that only used listed Greek companies. This comparative investigation could help in raising awareness of the impact of the economic crisis on Greece. Second, a comparison with other European companies can be carried out in the manner we have investigated. This would result in a better understanding and perspective on the extent of the economic crisis on Greek companies compared to companies in other countries. Third, a study of a sample using a different approach method (neural networks, multi-criteria analysis) could result in more significant conclusions. Such future research could be of additional usefulness to those interested parties (business executives, consultants, official authorities, and potential investors) who want to invest in Greece.

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