M&As in the Greek Industrial Goods and Services Sector: Are Really Profitable Investments or Not?

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Abstract
This study examines the impact of mergers and acquisitions (M&As) on the post-merger operating performance of merger-involved firms at industrial goods and services sector of the ASE (Athens Stock Exchange) in Greece. Using accounting data (financial ratios), the post-merger performance of a sample of Greek companies, listed on the Athens Stock Exchange that executed one merger or acquisition in the four-year-period from 2004 to 2007 as acquirers, is investigated. For the purpose of the study, a set of sixteen ratios is employed, in order to measure firms’ operating performance and to compare pre- and post-merger performance for three years before and after the M&A announcements (with accounting data analysis from 2001 to 2010). The results revealed that M&As had a negative impact on the post-merger performance of merger-involved firms as their debt (short-term liabilities and long-term liabilities) after M&As have increased significantly. Last, all the examined profitability ratios for the sample firms did not change significantly due to the M&A events.

Keywords: mergers, acquisitions, financial ratios, post-merger operating performance

JEL Classification: G34, M40

Introduction
The strategy literature commonly argues that mergers and acquisitions (M&As) are one of the mechanisms by which firms gain access to new resources and, via resource redeployment, increase revenues and reduce cost. The main hypothesis in successful M&As activities is that potential economic benefits arising from them are changes that increase economic performance that would not have been made in the absence of a change in control (Mantzaris, 2008; Pazarskis, 2008). However, many researchers and business practitioners regard with
scepticism this hypothesis, despite the fact that many others are confident and enthusiastic.

Hence, except of the “well-explored” cases of the US and the UK capital markets, there were only a few of extensive researches on M&As in the majority of other countries globally, diachronically. This proposition seems to be even more correct, if it is referred to the post-merger performance studies which employ accounting data (financial ratios), than event studies based on stock returns (Sudarsanam, 2003). Regarding the Greek market, which recently has been upwarded from a developing to a developed economy (Pazarskis et al., 2011b), there have been a few studies on M&As, most of which are either questionnaires of the involved firms’ executives or event studies based on announcement and completion dates, and there is a scarcity of post-merger performance studies with ratio analysis regarding firms involved in M&As activities, especially in the long run perspective or examining specific industry sectors.

This study focuses on the latter issue and tries to obtain new insights on the research subject of the business performance at the industrial goods and services sector of the ASE (Athens Stock Exchange) after M&As. In order to examine the post-merger operating performance of Greek firms after M&As activities in this sector, this study proceeds to an analysis of the post-merger performance of a sample of industrial firms, listed at the industrial goods and services sector of the Athens Stock Exchange (ASE) in Greece that executed one merger or acquisition in the period from 2004 to 2007, using accounting data (financial ratios), and attempts to investigate the M&As effects on their post-merger performance.

The structure of the paper is as follows: section 2 analyse the research design of this study (related past researches with financial ratios, sample and data, selection of variables-financial ratios, research methodology and hypothesis). Section 3 presents and analyses the results, and section 4 concludes the paper.

Research design

Related past accounting studies with ratios

Many past studies on accounting and finance, conducted with data of four decades ago or more, revealed that, in general, M&As transactions have resulted in poor performance of their involved firms (for the US cases with these results, see: Kelly, 1967; Reid, 1968; Monroe & Simkowitz, 1971; Stevens, 1973; and others; for the UK cases, see: Newbould, 1970; Singh, 1971; Tzoannos & Samuels, 1972; Buckley, 1972; Kuehn, 1975; Firth, 1976; and others).

More recent studies on M&As performance, that employed accounting data or ratios, were conducted during the last three decades and concluded on ambiguous results. Many of them supported an improvement in the post-merger performance after the M&As action (Weston & Mansinghka, 1971; Cosh et al., 1980; Seth, 1990; Parrino & Harris, 1999; Megginson et al., 2004; Choi & Philippatos, 2005; Abhyankar et al., 2010; and others), while others claimed that there was a deterioration in the post-merger firm performance (Weeks, 1977; Salter & Weinhold, 1979; MUELLETTI, 1980; 1985; Kusewitt, 1985; Ravenscraft & Scherer, 1987; Kaplan & Weisbach, 1992; Dickerson et al., 1997; Sharma & Ho, 2002; and others). Other researchers concluded in confronting results or
simply, a “zero” result from the M&As action (Kumar, 1984; Healy et al., 1992; 1997; Chatterjee & Meeks, 1996; Ghosh, 2001; Ramaswamy & Waeglelin, 2003; and others).

Concerning the case of Greek firms, Mylonidis & Kelnikola (2005) examined the post-merger performance of five merger bank deals in Greece, employing conventional pre- vs. post-merger accounting ratio comparisons; they concluded that merger activity had finally a positive impact on banks’ post-merger performance. Pazarskis, Lyroudi, Pantelidis and Christodoulou (2011b) have evaluated the impact of mergers and acquisitions on the post-merger performance of merger-involved firms in Greece in the long-run perspective with a set of twenty-six financial ratios; their results revealed that six out of the twenty-six ratios had decreased and only one was improved from the M&As events. Pazarskis, Karagiorgos, Christodoulou and Eleftheriadis (2009) have analysed the impact of mergers and acquisitions on the post-merger performance of forty listed M&As involved Greek firms; their results revealed that none of all the examined profitability ratios did not change significantly due to the M&A event. Pazarskis, Alexandrakis, Notopoulos, and Kydros (2011a) examined the impact of M&As on the post-merger operating performance of merger-involved firms in Greece at information technology industry, a knowledge-intensive industry. Their results revealed that M&As had a negative impact on the post-merger performance of the merger-involved firms, concerning their total debt analysis. Also there were not some other positive or negative impacts at any other examined ratio, which reveals a possible successful transfer of knowledge, but not the creation of potential synergies or cost reductions.

Sample and data

Firstly, in the period from 2004 to 2007, all the M&As activities from firms of Greek interests, listed in the Main market of the Athens Exchange at the industrial goods and services sector, are tracked, excluding from them the actions of their subsidiaries, as only a parent’s M&As action is examined. Secondly, from them for further analysis, are excluded the firms that performed M&As activities in less than a three-year period before and after the several M&As examined events. Also, in case of that some firms from this preliminary sample firms have been de-listed from the ASE for various reasons (bankruptcy, not meeting the standards of the market, etc.), they were excluded from the sample.

Thus, the final research sample consists of eight acquiring firms of industrial goods and services sector, listed in the ASE that executed one M&As action as acquirers in Greece during the period from 2004 to 2007. More analytically the sample firms with the year of M&A transaction are: 2004-Dionic S.A., Frigoglass S.A., Eltrack S.A., Crown Hellas Can S.A., Euroconsultants S.A.; 2005-Paperpack-Tsoukaridis S.A., Inform-Lycos S.A.; 2007-N.Galis S.A. The study proceeds to an analysis only of listed firms as their financial statements are published and it is easy to find them and evaluate from them firm’s economic performance.

The M&As activities of the listed Greek firms have been tracked from their announcements on the web sites of the ASE. The available data of this study (financial ratios) are computed from the financial statements of the M&As-involved firms and the databank of the Library of the University of Macedonia (Greece).
Selected accounting variables (financial ratios)

Financial ratios are widely used for modelling purposes both by practitioners and researchers, as their analysis is one of the most valuable tools for the decision-making of many interested parties, stakeholders: owners, management, personnel, competitors, academics, etc. Their analysis facilitates inter-company as well as intra-company comparisons beyond various argumentations (Pazarskis, 2008).

The post-merger operating performance of a firm is evaluated with its performance at some accounting ratios. For the purpose of this study, after the analysis of accounting data (financial statements) sixteen financial ratios are employed, which are the following ratios (see, Table 1).

There are many other approaches for accounting evaluation performance, different from the above. Return on investment (ROI) type of measures are considered as the most popular and the most frequently used when accounting variables are utilised to determine performance. However, in considering Kaplan’s (1983) arguments against excessive use of ROI types of measurements, the above referred ratio selection of this study is confirmed as better, as:

“...any single measurement will have myopic properties that will enable managers to increase their score on this measure without necessarily contributing to the long-run profits of the firm” (Kaplan, 1983, p. 699).

Thus, an adoption of additional and combined measures is believed to be necessary in order to provide a holistic view of the long-term profitability and performance of a firm, in accordance with the short-term one (Pazarskis, 2008; Pazarskis et al., 2011b).

Table 1: Classification of financial ratios

<table>
<thead>
<tr>
<th>Code</th>
<th>Variable Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V01</td>
<td>Current Ratio</td>
<td>Current Assets/Current Liabilities (CL)</td>
</tr>
<tr>
<td>V02</td>
<td>Acid Test Ratio</td>
<td>(Current Assets=Inventory)/CL</td>
</tr>
<tr>
<td>V03</td>
<td>Days Sales in Receivables</td>
<td>Accounts Receivable/Sales</td>
</tr>
<tr>
<td>V04</td>
<td>Inventory Turnover</td>
<td>Cost of Goods Sold (COGS)/Inventory</td>
</tr>
<tr>
<td>V05</td>
<td>Accounts Payable Turnover</td>
<td>(Trade Creditors/(COGS-Depreciation+ Closing Inventory-Opening Inventory))</td>
</tr>
<tr>
<td>V06</td>
<td>Total Debt ratio</td>
<td>Total Debt/Total Assets</td>
</tr>
<tr>
<td>V07</td>
<td>Total Debt to Equity</td>
<td>Total Debt/Equity</td>
</tr>
<tr>
<td>V08</td>
<td>Short-term Liabilities Turnover</td>
<td>Sales/Short-term Liabilities</td>
</tr>
<tr>
<td>V09</td>
<td>ROA Before Taxes</td>
<td>Earnings Before Taxes/Total Assets</td>
</tr>
<tr>
<td>V10</td>
<td>ROE Before Taxes</td>
<td>Earnings Before Taxes/Equity</td>
</tr>
<tr>
<td>V11</td>
<td>ROA After Taxes</td>
<td>Earnings After Taxes/Total Assets</td>
</tr>
<tr>
<td>V12</td>
<td>ROE After Taxes</td>
<td>Earnings After Taxes/Equity</td>
</tr>
<tr>
<td>V13</td>
<td>Total Assets Turnover</td>
<td>Sales/Total Assets</td>
</tr>
<tr>
<td>V14</td>
<td>Gross Profit Margin</td>
<td>Gross Profit/Sales</td>
</tr>
<tr>
<td>V15</td>
<td>EBIT Margin</td>
<td>EBIT/Sales</td>
</tr>
<tr>
<td>V16</td>
<td>EBITDA Margin</td>
<td>EBITDA/Sales</td>
</tr>
</tbody>
</table>

Research Methodology and hypothesis

The M&As action of each company from the sample is considered as an investment that is evaluated by the NPV criterion (if NPV≥0, the investment is accepted). Based on this viewpoint, the study proceeds
to its analysis and regards the impact of an M&A action similar to the impact of any other positive NPV investment of the firm to its ratios over a specific period of time (Healy et al., 1992; Pazarskis, 2008).

In order to evaluate the relative change with ratio analysis of the sample of the Greek firms that executed M&As actions, the general form of the hypothesis that is examined for each financial ratio separately (ratios from V0 to V16) is the following:

\[ H_0i: \text{There is expected no relative change of the financial ratio } i \text{ from the M&As event.} \]

\[ H_1i: \text{There is expected relative change of the financial ratio } i \text{ from the M&As event.} \]

where,

\[ i = \{ V1, V2, \ldots, V16 \} \]

The crucial research question that is investigated by examining the above mentioned ratios is the following: “Operating performance in the post-merger period is greater than it is in the pre-merger period for the sample firms of the industrial goods and services sector?” (Pazarskis, 2008).

The selected financial ratios for each company of the sample over a three-year period before (year T-3, T-2, T-1) or after (year T+1, T+2, T+3) the M&As event are calculated, and the mean from the sum of each ratio for the years T-3, T-2, and T-1 is compared with the equivalent mean from the years T+1, T+2, and T+3, respectively\(^1\).

Furthermore, the study does not include in the comparisons the year of M&A event (T=0) because this usually includes a number of events which influence firm’s post-merger operating performance in this period, as one-time M&As transaction costs, necessary for the deal, etc. (Healy et al., 1992; Pazarskis, 2008; Pazarskis et al., 2011b).

Last, to test this hypothesis two independent sample mean t-tests for unequal variances are applied, which are calculated as follows:

\[ t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \]

where,

\( n = \text{number of examined ratios} \)

\( \bar{X}_1 = \text{mean of post-merger ratios} \)

\( \bar{X}_2 = \text{mean of pre-merger ratios} \)

\( s = \text{standard deviation} \)

\(^1\) In this study, the mean from the sum of each accounting ratio is computed than the median, as this could lead to more accurate research results (Pazarskis, 2008). This argument is consistent with many other researchers diachronically (Philippatos et al., 1985; Neely & Rochester, 1987; Cornett & Tehnarian, 1992; Sarri, 1996; Sharma & Ho, 2002; Pramod Mantravadi & A. Vidyadhar Reddy, 2008; Pazarskis et al., 2006; 2009; 2010; Agorastos et al., 2011; and others).
Finally, the research results are presented in the next section.

Analysis of Results

The results revealed that over a three-year period before and after the M&As event only four (current ratio; acid test ratio; total debt ratio; total debt to equity) out of the sixteen accounting ratios had a statistically significant change due to the M&As event; and all the four of them present a deterioration. The rest twelve ratios, including several examined profitability ratios, did not change significantly and they did not have had any particular impact (positive or negative) on post-merger operating performance of merger-involved firms.

More analytically, the research presents over a three-year period before and after the M&As event that four out of the sixteen accounting ratios had changed significantly due to the M&A event (see, Table 2) as described below:

a) The variable V01 (current ratio) presents a decrease after the M&A transactions (Pre-merger average: 2,300 vs. Post-merger average: 1,597) that it is statistically significant at the 0.1 level (P-Value=0,086*), with 95% Confidence Interval (-1,5070; 0,1040).

The variable V02 (acid test ratio) presents a decrease after the M&A transactions (Pre-merger average: 1,960 vs. Post-merger average: 1,249) that it is statistically significant at the 0.1 level (P-Value=0,077*), with 95% Confidence Interval (-1,4960; 0,0800). This high decrease of current assets could be attributed to the lowest liquidity level due to several business events that was created from the action of unity by the merged firms or to a high increase of current liabilities.

b) The variable V06 (total debt ratio) presents an increase after the M&A transactions that is actually a deterioration of the firm performance in this ratio, as it is valid for the total debt ratio that a lower price shows a better performance, (Pre-merger average: 0,368 vs. Post-merger average: 0,505) that it is statistically significant at the 0.05 level (P-Value=0,015**), with 95% Confidence Interval (-0,0279; 0,2460).

The variable V07 (total debt to equity) presents an increase after the M&A transactions that is actually a deterioration of the firm performance in this ratio, as it is valid for the total debt ratio that a lower price shows a better performance, (Pre-merger average: 0,790 vs. Post-merger average: 1,390) that it is statistically significant at the 0.05 level (P-Value=0,042**), with 95% Confidence Interval (0,0240; 1,1780). This reveals that after the M&A events the sample firms have increased their total debt amount (due to bank loans, etc.) to their total assets three years later.

The rest twelve ratios (days sales in receivables; inventory turnover; accounts payable turnover; short-term liabilities turnover; ROA before taxes; ROE before taxes; ROA after taxes; ROE after taxes; total assets turnover; gross profit margin; EBIT margin; EBITDA margin), did not change significantly and they did not have had any particular impact (positive or negative) on the post-merger operating performance of merger-involved firms.
Furthermore, regarding the examined profitability ratios (variables V09-V12 and V14-V16), there is no significant change of any examined variable. This result is consistent with the results of some studies such as Kumar, 1984; Healy et al., 1992, 1997; Chatterjee & Meeks, 1996; and Ghosh, 2001. However, it is not consistent with the results of some other studies whereby: Neely & Rochester (1987) found a decline of the profitability ratios, especially the ROA, in the post-merger period, for the US market for the year 1976. Sharma & Ho (2002) also found a decline for the ROA and the ROE ratios. Similar results, with a decline of the profitability ratios, have been found by Meeks (1977), Salter & Weinhold (1979), Mueller (1980; 1985), Kusewitt (1985), Mueller (1985), Ravenscraft & Scherer (1987), Kaplan & Weisbach (1992), Dickerson et al. (1997). Last, these results for the Greek market, since there is no significant profitability improvement, do not support the hypothesis of market power (Lubatkin, 1983; 1987).

According to this approach, the market power that was gained by the acquirer after the merger or the acquisition should increase the new firm’s profit margins and therefore, its profitability (Pazarskis et al., 2011b).

### Table 2: Pre-merger and post-merger ratios

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-merger (3 years avg.)</th>
<th>Post-merger (3 years avg.)</th>
<th>T-statistic (Two-tail)</th>
<th>P-Value</th>
<th>Confidence Interval 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>V01</td>
<td>2,300</td>
<td>1,597</td>
<td>-1.77</td>
<td>0.086*</td>
<td>(-1.5070; 0.1040)</td>
</tr>
<tr>
<td>V02</td>
<td>1,960</td>
<td>1,249</td>
<td>-1.84</td>
<td>0.077*</td>
<td>(-1.4960; 0.0800)</td>
</tr>
<tr>
<td>V03</td>
<td>188.0</td>
<td>268.0</td>
<td>0.89</td>
<td>0.381</td>
<td>(-103.40; 262.70)</td>
</tr>
<tr>
<td>V04</td>
<td>6,940</td>
<td>17,000</td>
<td>0.89</td>
<td>0.386</td>
<td>(-13,600; 33,700)</td>
</tr>
<tr>
<td>V05</td>
<td>3,170</td>
<td>3,380</td>
<td>0.40</td>
<td>0.690</td>
<td>(-0.8490; 1.2690)</td>
</tr>
<tr>
<td>V06</td>
<td>0.368</td>
<td>0.505</td>
<td>2.53</td>
<td>0.015**</td>
<td>(0.0279; 0.2460)</td>
</tr>
<tr>
<td>V07</td>
<td>0.790</td>
<td>1.390</td>
<td>2.12</td>
<td>0.042**</td>
<td>(0.0240; 1.1780)</td>
</tr>
<tr>
<td>V08</td>
<td>3.030</td>
<td>2.580</td>
<td>-0.87</td>
<td>0.389</td>
<td>(-1.5060; 0.5980)</td>
</tr>
<tr>
<td>V09</td>
<td>0.0501</td>
<td>0.013</td>
<td>-1.05</td>
<td>0.301</td>
<td>(-0.1100; 0.0354)</td>
</tr>
<tr>
<td>V10</td>
<td>0.0811</td>
<td>0.013</td>
<td>-1.02</td>
<td>0.317</td>
<td>(-0.2042; 0.0689)</td>
</tr>
<tr>
<td>V11</td>
<td>0.0323</td>
<td>-0.003</td>
<td>-1.08</td>
<td>0.290</td>
<td>(-0.1032; 0.0321)</td>
</tr>
<tr>
<td>V12</td>
<td>0.0535</td>
<td>-0.015</td>
<td>-1.10</td>
<td>0.283</td>
<td>(-0.1980; 0.0604)</td>
</tr>
<tr>
<td>V13</td>
<td>0.637</td>
<td>0.632</td>
<td>-0.05</td>
<td>0.959</td>
<td>(-0.1797; 0.1707)</td>
</tr>
<tr>
<td>V14</td>
<td>0.2542</td>
<td>0.212</td>
<td>-1.30</td>
<td>0.201</td>
<td>(-0.1089; 0.0236)</td>
</tr>
<tr>
<td>V15</td>
<td>0.1020</td>
<td>0.082</td>
<td>-0.47</td>
<td>0.638</td>
<td>(-0.1045; 0.0650)</td>
</tr>
<tr>
<td>V16</td>
<td>0.1529</td>
<td>0.132</td>
<td>-0.44</td>
<td>0.665</td>
<td>(-0.1189; 0.0771)</td>
</tr>
</tbody>
</table>

Note: 
***, **, * indicate that the mean change is significantly different from zero at the 0.01, 0.05, and 0.10 probability level, respectively, as measured by two independent sample mean t-tests.

More analytically, the P-value interpretation levels for the above referred three cases are described below:
p<0.01 = strong evidence against Ho (see, ***)
0.01Sp<0.05 = moderate evidence against Ho (see, **) 
0.05Sp<0.10 = little evidence against Ho (see, *) 
0.10Sp> = no real evidence against Ho

### Summary and Conclusions

One of the main elements of contemporary corporate restructuring, with a universal acceptance, is the formation of new business entities via mergers and acquisitions (M&As). This study examines through an extensive accounting study the success of merger decision in Greece during the last years at a specific and very important sector for the Greek economy: the sector of industrial goods and services.
The events of mergers and acquisitions (M&As) that have been performed from merger-involved firms listed on the Athens Stock Exchange are evaluated using accounting data (financial ratios). The final sample of the study that is investigated consists of eight listed Greek companies of the industrial goods and services sector, which executed one merger or acquisition in the four-year-period from 2004 to 2007 as acquirers, with accounting data analysis from 2001 to 2010 (analysis for three years before and after the each examined merger event).

For the purpose of the study, a set of sixteen accounting ratios (current ratio; acid test ratio; days sales in receivables; inventory turnover; accounts payable turnover; total debt ratio; total debt to equity; short-term liabilities turnover; ROA before taxes; ROE before taxes; ROA after taxes; ROE after taxes; total assets turnover; gross profit margin; EBIT margin; EBITDA margin) is employed, in order to measure firms' post-merger performance and to compare pre- and post-merger performance for three years before and after the M&A announcements.

The results concerning a three-year-period after M&As reveal that mergers have had a relative change on the post-merger operating performance of the acquiring firms, as four out of the sixteen accounting ratios presented a deterioration due to the M&As event (current ratio; acid test ratio; total debt ratio; total debt to equity). As these four ratios with their decrease imply for a deterioration of the long-run operating performance (mainly, financial performance) of the acquiring firm after the merger, with the increase of the total debt (or partially of the current liabilities), the final conclusion from the above is that M&As have had finally a negative impact on post-merger operating performance of merger-involved firms of the industrial goods and services sector, and mergers deals as investment actions for the sample firms do not lead to enhanced operating performance.

Future extensions of this study could examine a larger sample from this sector that could include not only M&As-involved Greek firms listed in the ASE, but also non-listed firms and within other or larger time frame periods.

References


