Factors Affecting Firm Competitiveness: The Case of Greek Industry

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Abstract

The purpose of this paper is to develop and implement an adequate framework of firm competitiveness. The analysis is based on a data set of 102 Greek industrial firms listed on the Athens Stock Exchange during the period 1997-2004. The paper examines the impact of key determinants of firm competitiveness. We distinguish the explanatory variables as financial and non financial drivers of firm competitiveness. Our results show that leverage, export activity, location, size and the index for management competence significantly affect firm competitiveness. Furthermore, it is found that the relation between firm competitiveness indicators and drivers is due to effective management.

Key words

competitiveness, financial performance, panel data
1. Introduction

In the era of globalization, competition has become fiercer than ever. Reduced trade barriers, spread of technology and lower costs for communication and transportation have sharpened international competition. The economic changes in Eastern European countries, the completion of the European Union and the appearance of new economic powers in the global market have initiated specific discussion of production structures and the competitiveness of national industries. Intense competition in global and local markets requires firms to improve their competitiveness. This is especially true for smaller countries, like Greece where competitiveness can allow firms to overcome the limitations of their small home markets in order to achieve their maximum potential. This improvement not only benefits the firms themselves, but also has a direct impact on the competitiveness of an economy as a whole. A nation's standard of living is increasingly dependent on the competitiveness of its firms. The international business literature is replete with empirical and conceptual works pertaining to competitiveness. However, there is still debate among several disciplines regarding how the competitiveness of these firms should be measured and what factors affect competitive performance.

The purpose of this paper is to develop and implement an adequate framework of firm competitiveness. According to Lall (2001), a complete competitiveness analysis must define what competitiveness means and how it is to be measured and identify the most important factors influencing it, the interactions between these factors and how they affect the competitiveness of the subject of investigation. In our paper, we offer a framework to understand the meaning of firm competitiveness and its application. Our
specific research question is: “What are the determinants of firm competitiveness in successful firms working in distressed industries?”. The structure of this paper is as follows: Section 2 provides a brief review of concepts and measures of competitiveness. Section 3 discusses the data used and describes the methodology. Section 4 provides the estimation and the empirical results, while section 5 concludes.

2. Concepts and Measures of Competitiveness

Previous studies have shown that the indicators and drivers of competitiveness have multidimensional construct and complex relationships. Competitiveness can be considered as “multi-faceted” in nature as a number of variables should be jointly adopted to measure it. Economic literature examines competitiveness along two different levels: competitiveness of national economies (macroeconomic level) and competitiveness of firms/industries (microeconomic level). Longman’s Advanced American Dictionary (2000) provides a useful initial definition of competitiveness as “the ability of a company or a product to compete with others and the desire to be more successful than other people”. Literally, the term describes the ability of firms and industries to stay competitive which, in turn, reflects their ability to improve or protect their position in relation to competitors which are active in the same market. Therefore competitiveness of a firm can be taken as its ability to do better than comparable firms in sales, market shares, or profitability (Lall, 2001). Cook and Bredahl (1991, pp.1472 – 1473) argue that competitiveness can be viewed from a choice of geographic area, product or time. Beck (1990), states that competitiveness can be interpreted as the ability of firms to cope with structural change.
Being in line with the above strands of research we focus on the firm level of the term competitiveness. It is after all firms which compete with one another in the marketplace. Economy-wide conditions such as business-friendly economic policies, productivity and high levels of education might have profound impact on the competitiveness of firms. As competitive we can call the firm which can produce services or products of superior quality and lower costs than its domestic and international competitors. Competitiveness is synonymous with a firm's long-run profit performance and its ability to compensate its employees and provide superior returns to its owners (Buckley et al. 1988, p.176). In the context of the above, we measure a firm’s competitiveness by it's financial performance. When profitable opportunities exist, firms increase their production and sales. Thus, the existence of a good financial performance suggests a firm or industry with increasing competitiveness just as a bad financial performance suggests a firm or industry with falling competitiveness.

Various financial performance measures are often used for measuring the competitiveness of firms. For example return on sales reveals how much a company earns in relation to its sales, return on assets determines an organization’s ability to make use of its assets and return on equity reveals what return investors take for their investments. The advantages of financial performance measures are the easiness of calculation and that definitions are agreed worldwide. Traditionally, the success of a manufacturing system or company has been evaluated by the use of financial measures (Tangen, 2003). Table 1 presents an overview of the reviewed measures of financial performance.

<< Insert Table 1 here >>
Although financial indicators are the most widely used indicators of competitiveness, several non-financial performance proxies are also important. Examples of non-financial performance indicators are the market share of a firm, the market share growth and the overall customer satisfaction.

3. Data and Methodology

The purpose of this paper is to identify the factors which affect firm competitiveness in Greece. We use data for firms listed on the Athens Stock Exchange during the period 1997-2004. Firms are assigned to an industry group if more than 60% of their annual sales are from activities within that industry, provided the database used. Our initial sample consisted of 150 firms, rated above average, as far as their creditworthiness index is concerned. This is an index directly related to economic performance, it is generally accepted and it is drawn from the ICAP Hellas data base. The selected firms operated in distressed industries. A distressed industry is defined according to the same index of creditworthiness derived from the ICAP data base. The following firms were excluded from the sample:

- Firms belonging to industries with too few firms listed at the stock market (less than four firms).
- Firms involved in different activities as they could not be assigned to a particular industry.
- Banks, other financial institutions, and insurance companies, because of their special financial structure.
• Investment companies, because their incomes mainly result from the value of their holding portfolios. This value depends on the financial structure and business conditions of the firms whose stocks are included in the portfolio rather than the financial structure of the investment companies.

• Also some firms were excluded from the sample due to events such as bankruptcy or takeover.

The resulting sample for the eight year period 1997-2004 consisted of 102 firms in 15 industries.

<< Insert Table 2 here >>

We collected data for each firm from two sources. First, from the ICAP Hellas data base and second on the basis of a questionnaire. Furthermore, we validated questionnaires’ financial data and export activity of firms from the ICAP Hellas data base and the “Greek Export directory 2004-2005” respectively.

Information was compiled on the following areas:

• Financial data of the firm

• Level of education of the management team members

• Shareholding percentage of the management team members

• Existence of innovation in the firm

• Average years of experience of the management team members

• Average age of the management team members

• Number of employees

• Number of employees having tertiary education

• Location of the firm
• Age of firm

• Export activity of the firm

It appeared that these 102 firms have management teams who fulfill at least three out of five criteria that are described below:

• The average age bracket of the management team is 50-60 years old.

• Most of the management team’s members hold a university degree in finance or in engineering.

• The management team holds on average 34% of the company’s shares.

• The management team implements innovation practices. Innovation, according to Schumpeter (1934) and other more recent researchers (Lumpkin and Dess, 1996; West & Farr, 1990), refers to the introduction of a new product or a new technique in production or a new market or a new organization structure in the firm. If any of the above has taken place within the last four years the management team is an innovator.

• The average number of experience of the members of the management team is twenty years.

We use three measures to evaluate the financial performance and, therefore, the competitiveness of a firm: (a) Return on sales (ROS) or profit margin: ROS reveals how much a company earns in relation to its sales. These measures determine the company's ability to withstand competition and adverse rising costs, falling prices or declining sales in the future. (b) Return on assets (ROA): ROA is one of the most widely used financial models for performance measurements and it was developed by Dupont in 1919. ROA determines a firm’s ability to make use of its assets. (c) Return
on equity (ROE): ROE measures what return investors (i.e. stockholders) are getting for their investments in the firm. In other words it tells how well the company is doing for the investor (Tangen, 2003).

We use three empirical models, one for each depended variable of the firm’s competitiveness.

Based on the previous theoretical framework, we make the hypothesis that the following independent variables might affect significantly the firms’ competitiveness:

1) *Leverage*: It is measured by the ratio of total debt to equity (debt/equity ratio).

   It shows the degree to which a business is utilizing borrowed money. Companies that are highly leveraged may be at risk of bankruptcy if they are unable to make payments on their debt; they may also be unable to find new lenders in the future. Leverage is not always bad, however; it can increase the shareholders' return on their investment and make good use of the tax advantages associated with borrowing.

2) *Ratio of Fixed Assets to Total Assets*: It measures the extent to which fixed assets are financed with owners’ equity capital. A high ratio indicates an inefficient use of working capital which reduces the firm's ability to carry accounts receivable and maintain inventory and usually means a low cash reserve. This may often limit the ability of the firm to respond to increased demand for products or services. So we expect that this rate is negatively related to firm performance.

3) *Liquidity*: It refers to the degree to which debt obligations coming due in the next 12 months can be paid from cash or assets that will be turned into cash. Measured by the current assets to current liabilities (current ratio) shows the ability to
convert an asset to cash quickly and reflects the ability of the firm to manage working capital when kept at normal levels. When liquidity is excessive the effect on financial performance is negative.

4) *Investment Ratio*: The ratio of the net investment to the total assets. Net investment refers to an activity of spending, which increases the availability of fixed capital goods or means of production. Net investment is the total spending on new fixed investment minus replacement investment, which simply replaces depreciated capital goods. This ratio helps to give a sense of how much money a company is spending on capital items used for operations (such as property, plants and equipment). Continued investment in the capital of a firm is crucial because the useful life of existing capital diminishes over time. The amount of net investment compared to such things as revenue will differ between industries and between businesses depending on how capital intensive the business is. We expect that this ratio is positively related to firm competitiveness.

5) *Size*: The total number of a company’s employees is used as a measure of firm size. It is expected to correlate positively with profitability. A company's size is an important investment consideration. Firm size can affect financial performance. The size of the firm is an important factor as it influences its competitive power. Small firms have less power than large firms; hence they may find it difficult to compete with the large firms particularly in highly competitive markets. It is argued that the smaller the company, the more volatile and risky the investment.
6) *Age of the company:* measured as the number of years from the year of establishment of the firm up to 2004. It is expected to relate negatively with employment growth according to theory, but the effect on financial performance is uncertain (Agiomirgiannakis et al, 2006, p. 236). Older firms may also benefit from reputation effects, which allow them to earn a higher margin on sales. On the other hand, older firms might have developed routines which are out of touch with changes in market conditions, in which case an inverse relationship between age and profitability or growth could be observed.

7) *Location:* We test if the location of firms established in the two biggest Greek cities (Athens and Thessalonica) affects their competitiveness. Location is a dummy variable with two values, 1 for Athens and Thessalonica and 0 otherwise. We expect that firms located in Athens or Thessalonica could be better positioned (i.e. closer to their markets) to take advantage of changes in market conditions.

8) *Export performance:* It is the relative success or failure of the efforts of a firm or nation to sell domestically-produced goods and services in other nations. Exporting is a major element of international trade, and this is why it is argued constantly and consistently throughout the ages. There are two views concerning international exchange. The first, recognizes the benefits of trade. The second concerns itself with the possibility that some industries can be harmed and others can be benefited by foreign competition. We want to test if the export activity of firms affects their competitiveness. In order to find if there is such a relationship, we insert a dummy variable taking the value 1, if the firm is an exporter and 0 otherwise.
9) **Management Competence Index**: The management competence index, as a combination of financial and non-financial drivers of firm competitiveness is calculated as follows:

\[
management \ competence \ index = \frac{\text{profit}}{\text{number of professionals}}
\]

Profits are calculated before taxes for each consecutive year, between 1997-2004. As number of professionals, we keep the same number for all years (even though it is the actual figure of 2003) because we consider that there are small changes of this number over the years. If there are any changes, then these changes will have little effect to the final result of the index. According to Merikas et al. (2006, p.p. 16-17) as “professionals” we consider the personnel which fulfil two criteria:

- It processes a university degree (tertiary education)
- It is under the direct control or part of the management team.

From the above variables, the first four could be categorized as financial drivers, the next four as non-financial drivers and the last one as a combination of financial and non-financial drivers.

4. **Estimation and Empirical Results**

The relationship between competitive sources and performance were tested using panel regression analysis for the following reasons: First, because panel data suggests that firms are heterogenous and therefore do not run the risk of obtaining biased results. Second, because panel data gives more informative data, more
variability, less collinearity among the variables, more degrees of freedom and more efficiency. Finally, panel data are able to identify and measure effects that are simply not detectable in pure cross section or pure time-series data.

We chose the fixed effects model as an appropriate specification as we are focusing on a specific set of firms and our inference is restricted to this set of firms. The panel regression model consists of three separate regressions on the same set of explanatory variables. For each performance factor, the technique of panel least squares regression was applied to estimate the multiple regression coefficients \( (b_j) \) in an equation of the form:

\[
Y_t(\text{performance}) = b_0 + b_1 X_1(\text{lev(-1)}) + b_2 X_2(\text{lnsize}) + b_3 X_3(\text{lnage}) + b_4 X_4(\text{loc}) + b_5 X_5(\text{liquid}) + b_6 X_6(\text{capital}) + b_7 X_7(\text{export}) + b_8 X_8(\text{net_inv}) + b_9 X_9(\text{lnmc_index}) + u_t
\]

(1)

Where \( Y_t \) is the measure of firm performance (ROA, ROE and ROS). \( u \) denotes a random disturbance term. The regression coefficient \( (b_j) \) represents the expected change in the performance indicator associated with one-unit change in the \( z \)th independent variable, i.e. competitive sources. \( X_1(\text{lev(-1)}) \), \( X_2(\text{lnsize}) \), \( X_3(\text{lnage}) \), \( X_4(\text{loc}) \), \( X_5(\text{liquid}) \), \( X_6(\text{capital}) \), \( X_7(\text{export}) \), \( X_8(\text{net_inv}) \), \( X_9(\text{lnmc_index}) \), represent leverage, firm size, firm age, firm location, firm liquidation, firm rate of fixed to total assets, firm export activity, firm net investment ratio and firm management competence index, respectively.
We hypothesize that the described competencies, the independent variables have an influence on a firm's performance. We expected to find statistically significant support for the following hypotheses:

\( H1: \) Leverage \((X_1)\) positively relates to performance outcome.

\( H2: \) Firm size \((X_2)\) positively relates to performance outcome.

\( H3: \) Location \((X_4)\) of a firm in the two biggest Greek cities positively relates to performance outcome.

\( H4: \) Export activity \((X_7)\) positively relates to performance outcome.

\( H5: \) Net investments \((X_8)\) positively relate to performance outcome.

\( H6: \) Management competence \((X_9)\) positively relates to performance outcome.

Hypothesis 7, deals with the joint influence of four competencies on performance.

Therefore,

\( H7: \) Management competence \((X_9)\), Net investments \((X_8)\), Location \((X_4)\) and Firm size \((X_2)\) jointly lead to positive performance outcome.

Tables 3, 4 and 5 show the estimated coefficients with their t-ratios.

<< Insert Tables 3, 4 and 5 here >>

We run three panel least squares regression, one for each dependent variable, with a time series component of 8 (eight) years, 1997-2004. The cross sectional observations were 102. The method of estimation was panel least squares and the effects specification were period fixed (dummy variables), while for the covariance matrix cross section weights (PCSE) and White cross section weights were used with no d.f correction. In all three regressions, we used the lagged value of leverage \((\text{lev}(-1))\), the natural logarithm of age \((\ln\text{age})\), size \((\ln\text{size})\) and management index \((\ln\text{mc\_index})\). All
three dependent variables were expressed in their natural logarithm form (lnroa, lnroe, lnros), so the final estimation involved unbalanced panel data.

According to the results obtained, the panel regression models with dependent variables leverage, firm size, firm age, firm location, liquidation, fixed to total assets, firm export activity, net investment ratio and management competence index are all significant at p<0.01. In summary all seven hypotheses described above have been supported by the results of the statistical analysis. In more details:

An interesting result is the positive impact that an increase in the leverage of the firms has on their competitiveness when it is measured by Return on Assets (ROA) and Return on Equity (ROE). So \textbf{H1} cannot be rejected in two out of the three measures of firm competitiveness.

\textbf{H2} is also supported by the results. The relationship between size and performance indicates that larger firms are more profitable, according to theory and other empirical findings (Agiomirgiannakis et al, 2006; Voulgaris et al., 2003).

\textbf{H3} is also supported. As we expected, companies located in Athens or Thessalonica are benefited from their position (i.e. they are closer to their markets).

The results from the panel regression analysis show that exports positively relate to Return on Assets and Return on Sales. So we accept \textbf{H4}. \cite{8}

\textbf{H5} cannot be rejected since net investment ratio has positive influence in all three measures of competitiveness. It is very significant (p=0.000) for ROA and ROE but not so for ROS. This positive influence means that the amount of money a company spends on capital items used for operations (such as property, plants and equipment), which is
vital because the useful life of existing capital diminishes over time, influences positively company’s performance.

It appears that management competence index is significant in all three regressions and has the correct sign. So H6 cannot be rejected. More specifically it is shown that professionals who are managed by a team which carries all the attributes we specified, influences positively the company’s competitiveness. H7 is also supported. We could argue that the results are due to management competence since the management team decides for the location of the firm, for its size and its net investments. To expand this reasoning we support the view that the relationship between the dependent variables (i.e exporting activity) and the measures of financial performance are due to management competence. For example H1 (H1: Leverage (X₁) positively relates to performance outcome) is not rejected as a result of the effective management.

There are also negative relationships between examined competencies and performance. The age of firm is negatively related to all three measures of competitiveness. Ratio of Fixed Assets to Total Assets (capital) is negatively related to the measures of performance. In other words this relationship indicates that when this ratio is high there is an inefficient use of working capital which limits firm's ability to carry accounts, to maintain inventory, and to respond to an increased demand. High liquidity negatively influences competitiveness performance. As we can see from the Tables it is significant at 0.01 when performance is measured by ROA and ROE. In other words when the liquidity is excessive the effect on profitability is negative.
In summary, our study incorporates an analytical framework that includes a comprehensive set of links between competitiveness indicators (Yt) and drivers (Xt). The above-mentioned theoretical and empirical framework served as a basis for the development of a generic approach of firm competitiveness analysis, shown in Figure 1.

Management competence index ($X_9$), a combination of financial and non financial drivers, is connected with indicators and co-drivers by a specific way in order to underline the unique relation between effective management and firm competitiveness factors.

We believe that the competitiveness measurement model we develop represents a useful strategic tool for firms, because it can assist them in the analysis of their financial performance. Our approach also highlights the importance for firms of management competence. Finally, it evaluates the extent to which each explanatory variable affects the dependent variable. Therefore, this approach can be used as an additional tool to understand practical problems that arise when managers consider strategies to improve firm competitiveness.

5. Concluding remarks

In our study we presented an exploratory model of sources of firm competitiveness. We tested the general hypothesis that sources of competitiveness affect firm performance. Competitiveness of firms operating in distressed industries was measured with the use of three indicators of financial performance; return on assets, return on equity and return on sales. An econometric approach allows the data to
determine the functional relationship and the impact of leverage, size, age, location, export activity, net investment and management effectiveness on economic performance, while taking into account the heterogeneity among firms. Summarizing the results, it is found that leverage, export activity, location, size and the index for management competence are significantly correlated, as expected, with the economic performance of firms. Furthermore, we argue that the relation between firm’s competitiveness indicators and drivers is due to effective management.
Notes

1 Our view is in line with that expressed by Porter, buck in 1999. According Porter, it is the competitiveness of the microeconomic units, like firms, that explains most of the variations in macroeconomic growth. He used survey data on a sample of 52 countries to measure the quality of many aspects of the microeconomic business environment and the developments of firm strategy and operations. He used factor analysis to create a Microeconomic Competitiveness Index (MICI). He investigated the relation between a nation’s score on MICI and its relative GDP per capita and found a strong correlation. The results revealed that a lot of elements of the microeconomic environment move together. In the report of 1999, MICI explained 83.3% of variance in GDP across the sample. For more details see Porter (1999, p. 35).

2 See Lall (2001) as quoted in Henricsson & Ericsson (2005)

3 See, for example, Depperu D. and Cerrato D., (2005); Tangen S. (2003)

4 See Longman’s Advanced American Dictionary (2000), p.278

5 As it was discussed before, the suggested variables are very common and have been used by many other researchers. See among others Hart & Ahuja (1996); Konar &Cohen (1997); Agiomirgiannakis et al (2006).

6 This variable has been used by Merikas at al, 2006.

7 In fact, the fixed versus random effects issue has generated a hot debate in the biometrics and statistics literature which has spilled over into the panel data econometrics literature.
There is also a slightly negative but no significant (p=0.711) relation between exporting activity and Return on Equity.

For each data set of these four drivers we run three more regressions (one for each dependent variable) to compute the F-statistic in order to check the following hypothesis:

\[ H_0 : X_9 = X_8 = X_4 = X_2 = 0, \quad H_8 : X_9 \neq 0, X_8 \neq 0, X_4 \neq 0, X_2 \neq 0 \]

In all three regressions Prob (F-statistic) = 0.0000 < 0.01 meaning that coefficients are significant at 99% level. So we can reject \( H_0 \) in favour of \( H_8 \). The results are available upon request.
References


Athens Chamber of Commerce and Industry (Eds.), (2005). Greek export directory 2004-2005


### Table 1. Measures of financial performance

<table>
<thead>
<tr>
<th>Study</th>
<th>Financial performance measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cochran, Wood and Jones, 1985</td>
<td>Return on assets (ROA), Return on Equity (ROE), Net profit margin, Firm’s assets</td>
</tr>
<tr>
<td>Kesner, 1987</td>
<td>ROA, ROE and lagged total returns to investors</td>
</tr>
<tr>
<td>Mallette and Fowler, 1992</td>
<td>ROE</td>
</tr>
<tr>
<td>Opler &amp; Titman, 1994</td>
<td>Growth in sales, Growth in profitability and stock returns</td>
</tr>
<tr>
<td>Klassen &amp; McLaughlin, 1996</td>
<td>Stock market returns</td>
</tr>
<tr>
<td>Hart &amp; Ahuja, 1996</td>
<td>Return on sales (ROS), ROA, ROE</td>
</tr>
<tr>
<td>Konar &amp; Cohen, 1997</td>
<td>ROA, ROE</td>
</tr>
<tr>
<td>Thomas &amp; Tonks, 1999</td>
<td>Monthly excess stock market returns over the risk free rate.</td>
</tr>
<tr>
<td>Becker-Blease et al., 2005</td>
<td>EBITDA margin, EBIT margin, EBITDA as a percent of total assets, EBIT to total assets.</td>
</tr>
<tr>
<td>Merikas et al., 2006</td>
<td>Sales growth, Growth in profitability, Stock returns annual percentage change</td>
</tr>
<tr>
<td>Agiomirgiannakis et al., 2006</td>
<td>ROA</td>
</tr>
<tr>
<td>Bobillo et al., 2006</td>
<td>Sales, Net profit margin</td>
</tr>
</tbody>
</table>
Table 2. Firms by Industry

<table>
<thead>
<tr>
<th>INDUSTRY</th>
<th>No. OF FIRMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>13</td>
</tr>
<tr>
<td>Printing-publishing</td>
<td>6</td>
</tr>
<tr>
<td>Computers</td>
<td>7</td>
</tr>
<tr>
<td>Transport</td>
<td>3</td>
</tr>
<tr>
<td>Retailing</td>
<td>6</td>
</tr>
<tr>
<td>Food and drink</td>
<td>16</td>
</tr>
<tr>
<td>Basic metals</td>
<td>10</td>
</tr>
<tr>
<td>Elastics &amp; plastics</td>
<td>5</td>
</tr>
<tr>
<td>Non-metallic ore &amp; cement</td>
<td>5</td>
</tr>
<tr>
<td>Clothing</td>
<td>2</td>
</tr>
<tr>
<td>Machines-equipment</td>
<td>3</td>
</tr>
<tr>
<td>Metallic products</td>
<td>2</td>
</tr>
<tr>
<td>Refineries</td>
<td>1</td>
</tr>
<tr>
<td>Private hospitals</td>
<td>1</td>
</tr>
<tr>
<td>Wholesaling</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total number of Firms</strong></td>
<td><strong>102</strong></td>
</tr>
</tbody>
</table>
Table 3. Determinants of Return on Assets

<table>
<thead>
<tr>
<th>LnROA</th>
<th>Coefficient</th>
<th>t-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lev(−1)</td>
<td>0.028 ***</td>
<td>3.387</td>
</tr>
<tr>
<td>Lnsize</td>
<td>0.053 ***</td>
<td>3.557</td>
</tr>
<tr>
<td>Lnage</td>
<td>-0.076 **</td>
<td>-1.856</td>
</tr>
<tr>
<td>Loc</td>
<td>0.277 ***</td>
<td>8.559</td>
</tr>
<tr>
<td>Liquid</td>
<td>-0.117 ***</td>
<td>-6.418</td>
</tr>
<tr>
<td>Capital</td>
<td>-2.03 ***</td>
<td>-10.784</td>
</tr>
<tr>
<td>Export</td>
<td>0.367 ***</td>
<td>13.393</td>
</tr>
<tr>
<td>Net_inv</td>
<td>1.111 ***</td>
<td>7.902</td>
</tr>
<tr>
<td>Lnmcindex</td>
<td>0.12 ***</td>
<td>9.009</td>
</tr>
</tbody>
</table>
### Table 4. Determinants of Return on Equity

<table>
<thead>
<tr>
<th>LnROE</th>
<th>Coefficient</th>
<th>t-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lev(-1)</td>
<td>0.053 ***</td>
<td>3.059</td>
</tr>
<tr>
<td>Lnsize</td>
<td>0.168 ***</td>
<td>16.339</td>
</tr>
<tr>
<td>Lnage</td>
<td>-0.232 ***</td>
<td>-3.986</td>
</tr>
<tr>
<td>Loc</td>
<td>0.176 ***</td>
<td>4.122</td>
</tr>
<tr>
<td>Liquid</td>
<td>-0.141 ***</td>
<td>-8.672</td>
</tr>
<tr>
<td>Capital</td>
<td>-1.817 ***</td>
<td>-16.749</td>
</tr>
<tr>
<td>Export</td>
<td>-0.008</td>
<td>-0.37</td>
</tr>
<tr>
<td>Net_inv</td>
<td>0.657 ***</td>
<td>4.505</td>
</tr>
<tr>
<td>Lnmci</td>
<td>0.488 ***</td>
<td>11.956</td>
</tr>
</tbody>
</table>

R-squared: 0.639

F-statistic: 81.470

Prob(F-statistic): 0.000
Table 5. Determinants of Return on Sales

<table>
<thead>
<tr>
<th>LnROS</th>
<th>Coefficient</th>
<th>t-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lev(-1)</td>
<td>-0.043 **</td>
<td>-2.256</td>
</tr>
<tr>
<td>Lnsize</td>
<td>0.009</td>
<td>0.438</td>
</tr>
<tr>
<td>Lnage</td>
<td>-0.257 ***</td>
<td>-5.975</td>
</tr>
<tr>
<td>Loc</td>
<td>0.212 ***</td>
<td>3.884</td>
</tr>
<tr>
<td>Liquid</td>
<td>-0.005</td>
<td>-0.336</td>
</tr>
<tr>
<td>Capital</td>
<td>0.015</td>
<td>0.1</td>
</tr>
<tr>
<td>Export</td>
<td>0.115 **</td>
<td>2.221</td>
</tr>
<tr>
<td>net_inv</td>
<td>0.083</td>
<td>0.515</td>
</tr>
<tr>
<td>Lnmindex</td>
<td>0.077 ***</td>
<td>4.532</td>
</tr>
</tbody>
</table>

R-squared: 0.309  
F-statistic: 20.336  
Prob(F-statistic): 0.000

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level
Figure 1. A Generic Approach of Firm Competitiveness

FIRM COMPETITIVENESS

Y₁ (ROA)  Y₂ (ROE)  Y₃ (ROS)

FINANCIAL DRIVERS

X₁  X₃  X₄  X₅

NON FINANCIAL DRIVERS

X₂  X₆  X₇  X₈  X₉