



Competitiveness and profitability: The case of chemicals, pharmaceuticals and plastics



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ABSTRACT

The purpose of this study is to investigate the relationship between firm level competitiveness, firm profitability and financial factors, in the post crisis period, using a sample of Greek manufacturing firms from three separate sectors, chemicals, pharmaceuticals and plastics using panel data. We employ a binary logit model for competitiveness and an OLS model for profitability, to empirically detect the critical factors affecting competitiveness and profitability in severe depressionary conditions. No prior study has treated the competitiveness and profitability issue for those sectors so far. The findings suggest that profitability plays significant role in firm competitiveness for all examined sectors and size and exports are significant factors of competitiveness. Imports are found to have also a significant effect on competitiveness, because of the quality added to the final products and the high reliance on imports of those industries, however negative for chemicals, due to the cost disadvantage they create and the competitive structure of the sector. The model for profitability, suggests that small firms are the winners and that efficiency of fixed assets and labor are critical for high profit performance for all sectors. R&D is found to play a significant role in the profitability for pharmaceuticals and chemicals, in line with the literature.

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1. Introduction

Manufacturing, accounting for almost 10% of job positions in Greece, plays a key role in the prosperity of the country. Services not built on a vibrant manufacturing sector will not lift or sustain a nation's economy. Greece has suffered from deindustrialization as a result of manufacturing decline (Pitelis & Antonakis, 2003), while growth of manufacturing is regarded as a vital element in the sustainability of economic recovery. Greek manufacture has experienced an unprecedented decrease of its growth, after the crisis and a drop in its employment of 32.9% between 2008 and 2012, compared to 17.17% in total employment of the economy (Eurostat 2013) contributing to a 30% fall in GDP (authors' estimation based on European Commission – AMECO database data). According to Baltas (2013), Greece ran a payments deficit in goods but a surplus in services, which consists mainly of shipping and tourism. Although the surplus in services increased over time (from 4.0% of GDP in 1981, to 5.3% in 2001, to 7.6% in 2008), the deficit in goods increased much more (from –7.6% of GDP in 1981, to –18.4% in 2001, to –20.4% in 2008). In sum, there is no evidence in terms of balance of payment benefits for Greece after it joined the Eurozone.

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There are still more people employed in agriculture in Greece than in Eurozone as a whole (11% vs. 3%) fewer in industry (10% vs. 14%) and manufacturing (9% vs. 14%). Construction (6%) and services (63%) are the same as Eurozone average. Some 15% of GDP is derived from tourism (Oltheten, Sougiannis, Travlos, & Zakros, 2013).

Therefore, the country needs urgently policies that will help restructuring its economy and restarting its economic activity. Due to globalization, the issue of competitiveness has become increasingly important for firm and governmental policy specifications. Chemicals, pharmaceuticals and plastics in the manufacturing sector, are considered sectors with a potential for exports and therefore promising to contribute to the restarting of the Greek economy. Therefore, the need for this study.

Based on Eurostat data, chemicals account for 2.74% of the total employment in manufacture, pharmaceuticals for 3.89% and plastics for 2.96%. Chemicals and plastics have realized a 29% average decrease in employment in the period 2008–2012 (32.92% for the whole manufacture), while pharmaceuticals realized a 4.19% decrease, the lowest among all manufacturing sectors in Greece. Therefore, it is important to determine the critical factors of their performance and compare among them, in an attempt to reach into useful conclusions and policy implications for management and the State. Attempts have been made on the empirical level in determining and calculating competitiveness, yet, so far, to the best of our knowledge, there is not one empirical study on those sectors in Greece. From the previous statistics, it is obvious that especially pharmaceuticals is a promising and dynamic sector in Greece that should be encouraged. Dynamic sectors could be considered also the chemicals and plastics, given the trend in the development of new products and technologies, such as chemical waste treatment, etc. Both sectors composed of medium size firms (35–50 employees) comprise only about 5% of total manufacturing firms and 3% of its employment and with a decreasing trend in industrial production. Given the fact that the specific sectors require skilled personnel and many with university level education, Greece offers a competitive advantage with the supply of university graduates chemists and pharmacists who remain unemployed due to the deindustrialization of the Greek economy and the recent economic crisis which hit the country.

Worldwide the chemical industry has been able to grow in recent years because natural gas prices have dropped dramatically. According to the U.S. Energy Information Administration, natural gas was \$1.89 per thousand cubic feet (not including transportation costs) in April 2012, down from \$10.79 in July 2008. Empirical research studies on chemicals and plastics on firm level competitiveness are very limited in the international literature, or focusing only on the effect of intangibles and R&D on their profitability. The sectors are interrelated in terms of raw material and production and they are very capital and R&D intensive industries in developed economies abroad. The chemicals and plastics are a leading force in economic growth for a country and can help an economy bounce back from recessions.

Given the importance of the sectors, the scope of this paper is to identify the critical factors and forces which determine the ability of firms to compete in conditions of economic crisis, in three important manufacturing sectors for Greece, i.e. pharmaceuticals, plastics and chemicals during the period 2008–2011, a period of severe economic down turn for the country, assuming that economic depression conditions create a new business environment in which firms have to adopt and survive. It also attempts to identify differences in the factors among the three sectors and based on those formulate policies for their support and growth. The competitiveness of firms, measured by their market share, is postulated to depend on indicators of firms' innovation, cost efficiency, labor productivity, fixed assets investment efficiency, investment in new machinery, capital structure, importing and exporting activity, as well as firm characteristics and their environment, such as firm experience, macro environmental factors and the know how provided by FDI in the country.

We used firm level financial data and panel data analysis for a sample of 361 Greek manufacturing firms. The structure of the paper is as follows: Section 2 presents a brief overview of the literature on the competitiveness concept and its measurements. In Section 3, data and methodology are presented along with hypothesis testing for the variables used. In Section 4, the results of the empirical analysis are presented and discussed and Section 5 concludes and suggests policy implications.

2. Theory and literature review

The issue of competitiveness of the manufacturing sector has been conventionally assessed both at the regional and firm level. Recently there has been an increasing emphasis on firm level since it is generally agreed that the ability of nations to grow and provide their citizens with better standard of living, depends on the competitiveness of their firms.

Prominent studies that emphasize firm specific definition of competitiveness include Prahalad and Doz (1987), Bartlett and Ghoshal (2002) and Prahalad and Hamel (1990). They suggest that global operations and resource positions, key determinants of competitiveness, are firm specific.

The strand of literature from Austrian to evolutionary economics and the endogenous growth, argues that the ability of the firms to compete depends on their own activities and more important by their innovation activity, according to Schumpeterian theory of creative destruction, enabling firms to attain monopoly power by charging lower prices and better quality products. Increased productivity, efficiency, investment in machinery, innovations and other mechanisms of restructuring can enable firms to seize market share from their rivals, even in economic crisis periods (Aghion & Howitt, 2005; Hashi, Hashi, & Telhaj, 2011; Loof, Heshmati, Asplund, & Naas, 2002). As Harrison and Kennedy (1997) argue, firms with positive profits indicate that they are able to create barriers preventing the entry of new firms (whose entrance would result in profits decreasing to zero for all firms in the industry), that is to say they are able to maintain their market shares and thus possess some type of competitive advantage. Market shares are sometimes mentioned as a way of assessing a firm's competitiveness, but the concept is often quantitatively measured by profitability variables.

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