

# **Factors affecting Firm Performance in periods of Financial Crisis: Evidence from the listed on the Athens Stock Exchange Food Companies**

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## **Abstract**

*This paper aims to explore factors affecting firm performance during the period of the financial crisis in Greece. For this purpose the listed food companies on the Athens Stock Exchange (ASE) were examined for the period 2008 - 2012.*

*Corporate profitability was selected as a proxy for company performance and was regressed on firm characteristics and key financial indicators (firm size, liquidity, leverage, receivables/payables turnover and capital employed to net fixed assets ratio). Using panel data, regression results showed a positive association between profitability and company size and payables turnover days. Findings indicate that larger firms and firms with a relatively longer time between purchases and payment for them were more profitable during the period of the financial crisis. On the other hand, a negative association was found between profitability and capital employed to net fixed assets ratio and inventory turnover days. The remaining variables were not found to be significantly correlated.*

*Our results about the impact of firm size on firm performance confirm the findings of previous studies in Greece. The findings regarding the impact on profitability of capital employed to net fixed assets ratio, payables and inventory turnover enrich the existing literature on the factors which affected the performance of listed food companies during the crisis. Finally, future research could include non listed food companies in Greece and could expand in more firm years. In addition, the impact of corporate governance could be explored.*

**Keywords:** firm performance, financial crisis, diary food, ASE

**JEL Classifications:** M41 Accounting, M40 General.

## **Introduction**

The collapse of the subprime market in the United States (US) in 2007 sparked a global financial crisis which, however, had little impact on the Greek financial market until 2010 (Notta and Vlachvei 2014). The revision of the Greek deficit and the increase of the borrowing cost led to the adoption of a bailout package by the International Monetary Fund (IMF), the European Central Bank (ECB) and the European Commission (EC) in May 2010. The implementation of the austerity measures that followed the bailout agreement caused a substantial decrease in the demand for goods and services and a deep recession (Kontogeorgos, Pendaraki and Chatzitheodoris 2017). The financial

crisis in Greece, which peaked in 2012 with the restructuring of the Greek debt held by the private sector (PSI), affected severely all aspects of economic life, both at the individual and at the corporate level.

The aim of this paper is to examine the factors affecting the performance of Greek listed companies during the adverse circumstances of the five-year-long financial crisis. For this purpose, the profitability of food companies listed on the ASE was examined for the period 2008-2012 using panel data regression. The findings of the study contribute to the existing literature by further strengthening the evidence regarding the relationship between profitability and firm size. In addition, significant associations were established between firm profitability and the ratios of payables turnover, inventory turnover and capital employed to net fixed assets.

The remainder of this paper is organized as follows: Part two contains a brief literature review of previous studies regarding firm performance and economic crisis. Part three sets out the research model and the data used in the study. The descriptive statistics and panel data regression results are presented and discussed in part four. The paper ends with a summary of the main findings, as well as with suggestions for future research. Finally, a detailed list of the food companies listed on the ASE that were included in the study is provided in the appendix to the paper.

## **Literature review**

Firm performance always attracted research interest, especially during periods of economic crisis. Recent economic history has witnessed two major crises: the 1997 Asian financial crisis and the 2008 global financial crisis, with inter-crisis periods at country level, such as in Argentina (2001). Much of prior research focuses on firm performance during these two periods. Another stream of research examines the relationship between firm performance and corporate governance during the same periods.

Claessens, Djankov and Xu (2000) studied corporate performance during the East Asian financial crisis in six countries, concluding that firm-specific weaknesses which existed in the pre-crisis period were important factors that contributed to performance deterioration during the crisis. Tan (2012) examined the relationship between firm performance and financial distress, also during the 1997-1998 Asian financial crisis in eight East Asian countries, finding that firms with low financial leverage tend to perform better compared to firms with high leverage. Hossain and Nguyen (2016) examined firm performance of Canadian oil and gas companies for a ten-year period (2004-2013), finding a negative correlation between performance and leverage for all the three periods examined: pre-crisis (2004-2006), crisis (2007-2009) and post-crisis (2010-2013).

Joh (2003) examined the relationship between firm profitability and corporate governance in Korea before the economic crisis of 1997, concluding that firms with a high disparity between control rights and ownership rights exhibited low profitability. The influence of corporate governance on financial firm performance during the 2008 financial crisis was examined by Erkens, Hung and Matos (2012) who found that financial firms with higher institutional ownership and more independent boards presented worst stock returns than other

firms, suggesting that corporate governance had an important impact on firm performance during crisis. Saleh, Halili, Zeitun and Salim (2017) investigated the impact of the 2008 global financial crisis on listed Australian firms. Their results showed that family firms with ownership concentration performed better than non-family firms with dispersed ownership. Moreover, financial leverage had a significant and positive effect on firm performance.

As far as Greece is concerned, research regarding firm performance during the financial crisis is limited, as only a few studies have been conducted in this area. More specifically, Notta and Vlachvei (2014) examined the impact of the 2008 financial crisis on Greek food manufacturing companies. Results showed that in the pre-crisis period only market share (firm size) had a significant impact on profitability whereas, during the crisis, profitability was significantly affected by market share, liquidity and leverage. Another study in Greece was conducted by Kontogeorgos et al (2017) who studied the impact of the economic crisis on the cheese industry, concluding that profitability was adversely affected by the crisis. As far as the dimension of corporate governance is concerned, Georgantopoulos and Filos (2017) analyzed the impact of board structure on bank performance during the sovereign debt crisis (2008-2014), finding that the corporate governance framework positively affected Greek bank value.

Food companies were chosen for this study because the food and beverage industry is one of the most important sectors of Greek manufacturing and - according to a study conducted in 2018 by PricewaterhouseCoopers (PwC)- accounts for about 30% of total employment and revenue. In 2011 the food and beverage sector covered 27,8% of the total employment of the secondary sector and in 2009 it concentrated 26,2% of the total turnover of the manufacturing sector in Greece (Notta and Vlachvei 2015). The industry managed the recent years to remain unaffected by the economic restraints and during 2012 - 2015 increased its total exports by 26%, attributed mainly to the subsectors of oils and dairy products (PwC 2018).

This study complements prior studies conducted in Greece as it includes year 2012, one the most significant years of the crisis, in which the Greek debt was restructured by PSI. PSI was the largest event in debt restructuring history and the first one that occurred in the euro zone (Xafa 2014). In addition, this study differs from prior studies in Greece as it focuses exclusively on listed food companies. Listed companies are of particular interest as their shares are traded in the share market and are exposed to public scrutiny. Moreover, although listed companies have the ability to raise funds from the capital market they face higher costs due to increased disclosure and compliance requirements.

## **Data and research model**

### **Data**

The data used in the study concern food firms listed on the ASE and were sourced from ICAP over the five-year period 2008-2012. No sampling method was applied given that the whole population of the listed food companies in Greece was taken into account. In total, 13 food companies were examined using a balanced panel of 65 observations. Descriptive statistics of the aforementioned population

are presented in section four. A detailed list of the companies examined in the study is provided in the appendix to the paper.

Listed food companies were preferred to unlisted companies because their population ensures consistent and reliable data and financial ratios. This is attributed to the fact that listed companies apply mandatorily International Financial Reporting Standards (IFRS) and have corporate governance structures that result to more reliable financial statements and measurement of their current value. Furthermore, the audit of the financial statements by certified public auditors is compulsory for all listed companies.

### Research model

The basic assumptions of the standard error component model are that the regression disturbances are homoskedastic and that no serial correlation is allowed (Baltagi 2005). In addition, panel data models often exhibit substantial cross-sectional dependence in the errors which may arise due to the presence of common shocks and unobserved components that finally become part of the error term (De Hoyos and Sarafidis 2006). Consequently, OLS, Fixed and Random effects models are not valid when residual test shows a violation of their basic assumptions (Kontogeorgos et al 2017). An approach for correcting the above issues is to use the pooled OLS regression model with Driskol and Kraay standard errors, which are well calibrated when cross-sectional dependence is present (Hoechle 2007). This approach is well documented in prior research (i.e. Kontogeorgos et al 2017).

The panel regression model estimated in this study is the following:

$$\text{prof}_{it} = \beta_0 + \beta_1 \text{fsize}_{it} + \beta_2 \text{capna}_{it} + \beta_3 \text{lever}_{it} + \beta_4 \text{liq}_{it} + \beta_5 \text{rec}_{it} + \beta_6 \text{pay}_{it} + \beta_7 \text{inv}_{it} + \varepsilon_{it}$$

Where:

- Prof: profitability measured by gross profit to sales ratio
- Fsize: firm size measured by log of total assets
- Capna: capital employed to net fixed assets ratio
- Lever: leverage measured by debt to equity ratio
- Liq: liquidity measured by current assets to current liabilities ratio
- Rec: accounts receivables turnover measured by the average days needed to collect receivables
- Pay: accounts payables turnover measured by the average days needed to pay creditors
- Inv: inventory turnover measured by average days inventory turned into sales
- $\varepsilon$ : the disturbance term

All the above data for the variables used in the study were obtained from ICAP data base and processed by STATA software.

## Descriptive statistics and regression results

### Descriptive statistics

Table 1 below illustrates the descriptive statistics of the dependent and independent variables for the period 2008 - 2012:

**Table 1: Descriptive statistics for the period 2008-2012.**

Variable	Obs.	Mean	Std Dev	Min.	Max.
Prof	65	24.10369	13.47784	0	48.24
Fsize	65	8.43e+07	7.38e+07	9,657,750	2.95e+08
Capna	65	1.826462	2.140935	0.52	10.62
Lever	65	2.074615	1.254821	0.49	8.65
Liq	65	1.365538	0.8376922	0.44	5.12
Rec.	65	164.3692	83.08835	84	412
Pay.	65	98.09231	65.94499	8	264
Inv.	65	61.58462	37.06788	12	189

Source: Author's estimations.

Average values per year are illustrated in the table below:

**Table 2: Average values per year.**

Year	Prof	Fsize	Capna	Lever	Liq	Rec	Pay	Inv
2008	25.05	85,442,855.92	1.71	1.86	1.40	160.08	91.38	74.15
2009	25.77	83,837,067.23	1.82	1.87	1.51	164.15	88.00	67.00
2010	24.23	83,455,375.85	1.85	1.93	1.31	165.69	103.54	59.85
2011	22.29	85,215,631.85	1.85	2.18	1.32	164.31	102.62	51.15
2012	23.18	83,368,156.69	1.90	2.53	1.29	167.62	104.92	55.77
Average	24.10	84,263,817.51	1.83	2.07	1.37	164.37	98.09	61.58

Source: Author's estimations.

As shown in the above tables 1 and 2, the financial crisis had a significant impact on the operations and the financial performance of listed food companies in Greece. In particular, the profitability (% of gross profit to sales) dropped from approximately 25% in the beginning of the financial crisis to 24% in 2010 and 22% in 2011. Average debt to equity ratio (leverage) increased from 1.86% in 2008 to 2.53% in 2012, which indicates that listed food companies have been aggressive in financing their operations with debt. Although average liquidity increased to 1.51 in 2009, it soon followed a decreasing trend, dropping to 1.29 in 2012.

The average values of receivables and payables turnover days also reflect the financial difficulties that listed food companies faced in the period 2008-2012. More specifically, while it took on average 160 days to collect account receivables in 2009, this number increased to 167 days in 2012, reflecting a delay of customers to fulfill their obligations. Accordingly, while accounts payables were settled within 91 days on average in 2008, this number increased to 104 days in 2012, demonstrating the difficulty of listed food companies to meet their obligations to suppliers. Finally, the average days for which goods remained in inventory decreased from 74 days in 2008 to 55 days in 2012. However, this improvement in inventory turnover is offset by the overall decrease in profitability.

### Regression results

Table 3 that follows illustrates the results of panel regression for the years 2008-2012:

Table 3: Regression results.

Dep. Var.: prof	Coef.	Drisc/Kraay Std. Err.	T	P>   t	95% Conf	Interval
Fsize	4.970854	0.6464908	7.69	0.002***	3.175908	6.7658
Capna.	-4.591794	0.9489482	-4.84	0.008***	-7.226496	-1.957091
Lev.	0.3959798	1.101213	0.36	0.737	-2.661478	3.453438
Liq.	8.682888	4.078966	2.13	0.100	-2.642136	20.00791
Rec.	0.0311149	0.0176248	1.77	0.152	-0.0178195	0.0800493
Pay.	0.1030325	0.0132162	7.80	0.001***	0.0663386	0.1397265
Inv.	-0.1006717	0.0375774	-2.68	0.055*	-0.2050031	0.0036598
Cons.	-77.88097	15.52882	-5.02	0.007***	-120.9959	-34.76607
Regression with Driscoll-Kraay standard errors Method: Pooled OLS Group variable (i): firm num			Number of obs = 65 Number of groups = 13 F(7, 4) = 352.01 Prob > F = 0.0000 R-squared = 0.5535 Root MSE = 9.5429			
*=significant at 10%, **=significant at 5%, ***=significant at 1%						

Source: Author's estimations.

As shown in the above table, F value indicates that the model used in the study is significant (prob >F =0.0000). Regression results indicate that firm size and payables turnover had a significantly positive effect on the profitability of listed food companies, with a level of significance amounting to 1%. On the other hand, a significantly negative association between profitability and capital employed to net fixed assets ratio was identified, with the level of significance amounting also to 1%. Inventory turnover also had a negative impact on the profitability of listed food companies. However, this effect has a level of significance amounting to 10%. The remaining variables were not found to be significant explanatory factors of the profitability of listed food companies in Greece, during the crisis period of 2008-2012.

## Conclusions

The aim of this study was to determine the factors that affected the performance of food companies listed on the ASE during the 2008-2012 financial crisis. For this purpose, the profitability of 13 listed food companies was regressed on seven explanatory variables which included firm size, capital employed to net fixed assets ratio, leverage, liquidity, receivables turnover, payables turnover and inventory turnover, using panel data. The descriptive statistics of the aforementioned variables reflect the significant impact that the financial crisis had on the performance indicators of food companies listed on the ASE.

Panel regression results demonstrate that profitability was significantly and positively associated with firm size and payables turnover, thus indicating that firms which were larger in terms of total assets and had higher payables turnover days presented an increased profitability during the crisis. On the other hand, a negative correlation was identified between profitability and capital

employed to net fixed assets ratio and inventory turnover days. The remaining variables of the study were not found to be significant explanatory factors of the performance of listed food companies in Greece during the period 2008-2012.

Results regarding the impact of firm size on the performance of listed food companies confirm the findings of previous studies conducted in Greece (i.e. Notta and Vlachvei 2014, Kontogeorgos et al 2017). The findings regarding the impact on profitability of capital employed to net fixed assets ratio, payables turnover and inventory turnover offer new insight into the factors that affected the performance of listed food companies during the crisis and enrich the existing literature. Finally, future research could include non-listed food companies in Greece and could span over a longer period. In addition, the impact of corporate governance attributes on firm performance could be explored.

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## Appendix

**Table 4: List of companies examined in the study**

No	COMPANY NAME
1	Creta Farm SA (KRFr.AT)
2	Karamolengos Bakery Industry SA (KRMr.AT)
3	Hellenic Sugar Industry SA (HSI.AT)
4	Kri Kri Milk Industry SA (KRlr.AT)
5	PG Nikas SA (NIKr.AT)
6	Loulis Mills SA (LOUr.AT)
7	Flour Mills Kepenos SA (KEPr.AT)
8	Evrofarma SA (EVRr.AT)
9	Perseus Specialty Foods SA (PRSr.AT)
10	Kreka SA (KREKA.AT)
11	Flour Mills C Sarantopoulos SA (SARr.AT)
12	Kriton Artos SA (KRHr.AT)
13	Chatzikraniotis and Sons Mills SA (CHAr.AT)