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**The Effects of Regional Policy Incentives on Firm Profitability and Survival:  
A Case Study of the Greek Food Industry**

by

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**Abstract**

Research on the effects of regional financial incentives has focused on firm and aggregate employment, on capital formation, regional output, and on aspects of regional policy efficiency. More specifically, research on regional policy efficiency has concentrated on issues such as additionality, displacement, and deadweight, the cost per job created, etc. The present paper examines the consequences of providing financial incentives on firm profitability and survival.

Firm profitability may be variously defined, however, recent research has attempted and successfully attached a wide definition of firm profitability pertaining to the firms financial structure, efficiency and liquidity. A sample of firms that were granted aid under the Greek regional development framework is examined and the evolution of certain financial indices is related to the size of the granted aid. Furthermore, the effect of various financial incentives on firm survival is measured. The receipt of grant aid prolongs firm survival rates while it does not improve all of a firm's profitability indices.

JEL Classification: R58, R42, R51, G32

**1. The Greek Regional Development Framework**

Right after World War II, the Greek economy faced two major problems. First, a destroyed manufacturing industry and agricultural sector and second, a large and wide regional inequality in development and growth rates. Different governments since 1949 attempted to solve the problem of unbalanced regional growth. In 1949, tax incentives aiming to strengthen the industry in provinces and rural areas, were adopted by the

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state. In 1952 a law named 'Law for the Protection of Provincial Industry' further strengthened and broadened these incentives. This framework stated the first 'regional' differentiation of industry by defining 'provincial industry' as every industry established or transferred in every province and region except Athens. In 1955, the first industrial zones were established in different towns and regions of Greece while tax reductions for manufacturing industries were further supported and reached 80% in the lagging areas of the country.

In the period 1961-67, the country was divided into seven planning regions. This was eventually the first measure of decentralization of the central government, albeit the fact that the created administrative mechanisms had no statutory rights. The first pure regional development framework was introduced in 1971. In this framework, Greece was divided in three regions where various quantitatively differentiated incentives held. The first incentives concerned with tax reductions but consecutive alterations to this basic regional framework provided subsidies for the establishment of new firms and extended the incentives besides the manufacturing industry to the mining industry and the primary sector. In the period to 1981, various amendments to the previously established regional development framework extended incentive provision and support to the tertiary sector and especially the tourism industry of the country.

In the period to 1982, the targets of the Greek regional policy as these appear from the previously reviewed laws and as these are summarised by CPER (1976, p.84) and the OECD (1981) were:

- The reduction of the differences in income among the different regions of the country and more specifically between Greater Athens Area and the rest of the country
- Decentralization from Athens of certain economic, social and administrative activities
- Curtailment of internal migration from the less developed areas to the major cities and particularly to Greater Athens Area
- Creation of employment opportunities in less developed regions by promoting industrial, tourist and other economic activities
- The rational utilization of the resources of all regions
- The provision of the proper economic environment for the self-powered development of different economic activities
- Improvement of the standard of living in the less developed regions by expanding basic infrastructure and social services
- The improvement of the economic structure of rural areas

In 1982, the first integrated and coherent framework for regional development was introduced by Law 1262/82. In 1990 the regional development Law 1892/90 as amended by Law 2234/90 corrected and completed the regional development framework held up to 1998. Under these frameworks, four types of incentives were provided to all industries: Capital subsidies in the form of free capital provision differentiated among the different regions of the country; Interest rate subsidy on the bank loans received for servicing the investment; Tax free discounts on the firms net profits, if new investments are realised; Increased depreciation on the firm's fixed assets.

Until now, very few researchers have attempted to examine the effects of Greek regional development policy and assess whether the aims and objectives of the policy were met. One interesting work examined the impact of regional grant aid to the spatial distribution and sectoral structure of investments under the regional development framework 1262/82 (Georgiou, 1991). Psycharis and Papadaki (1996) have attempted to examine various issues concerning with the sectoral and spatial concentration of investments under the regional framework 1892/90. Other researchers have examined the effectiveness and efficiency of grant-aid schemes specifically for firms in lagging rural areas of the country, including schemes under the Common Agricultural Policy (Skuras and Tzamaras, 1997). All aforementioned research has focused on the effects of grant-aid on either the macro characteristics of the regions (concentration, sectoral structure, etc.) or on job creation and the additionality of grant aid.

There is very little research internationally on the effects of grant aid on firm profitability and survival. In other words we have little information on the effects of regional development grant aid on the firm's investment behaviour and on the firm's performance. In this work we attempt a preliminary examination of the effects of grant aid on firm profitability. For this reason we have selected the Food manufacturing industry, one of the most important and dynamic sectors of the Greek economy.

## **2. Data and Methods**

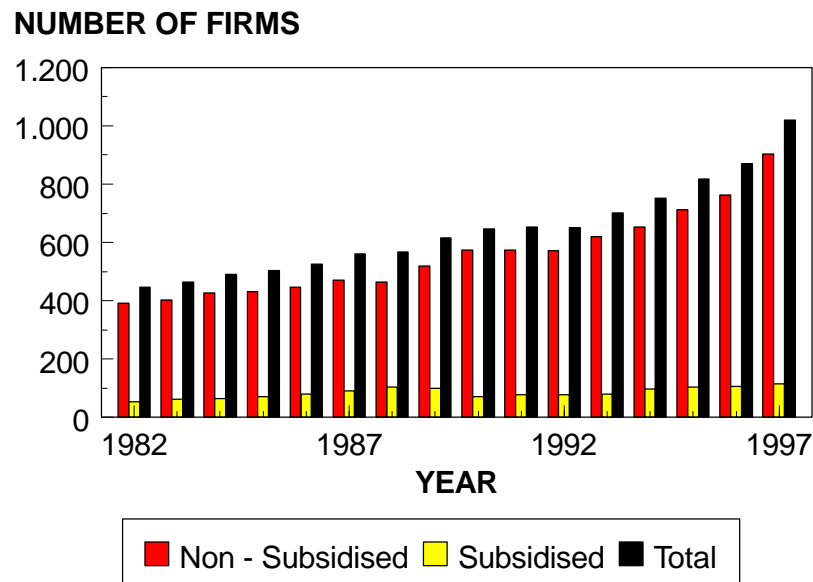
In order to accomplish our research tasks we have compiled data from three distinct databases. First, a database of firms supported under the 1262/82 regional development framework, including all companies that were subsidised between 1982 and 1989. Second, a database of firms supported under the 1892/90 regional development framework, including all companies that were subsidised between 1991 and 1998. Third, a database containing financial and business characteristics of limited firms for the period 1982 to 1998. The first two databases are maintained by the Ministry of National economy and include all companies irrespective of their size, while the third database is maintained by ICAP, a private consulting company and includes only limited companies. From the three databases we isolated the companies active in the Food-Beverages manufacturing sector and for the period 1982-1998. Thus, for this period and for the specific type of companies we have a consolidated database containing financial characteristics and information on grant aid. Figure 1 shows the final number of subsidised and non-subsidised firms of the Food and Beverages Sector that remained in the database and are subject of examination.

The figure shows the total number of firms existing in the database each year and the number of firms that had or had not received a grant aid in any year in the study period. The total number of firms grew from 446 in 1982 to 1019 in 1997. This is not due to firm birth during the period under consideration but due to the fact that various firms converted their legal status to a limited company status and thus, qualified for inclusion in the database of financial data. In the respective period we have found that 115 firms received aid from the regional development frameworks in operation. The database of the firms financial structure contained information that allowed us to construct a number of various indices for studying firm financial performance.

The term performance is used to mean the ability to generate the necessary resources for investment and meeting the firms commitments vi-a'-vis all players (employees, government, lenders , suppliers, etc.). In evaluating a firm's performance, it is important to take into account the various choices that determine the long-term survival of the firm . Three kinds of management choices exist :

- choices of market, namely identifying a need which can be profitably satisfied, i.e. according to the method and terms of financing obtained.
- choices of investment, i.e. defining a combination of factors of production integrating both technology and organization;
- choices of organization, which determine how time lag in return on investment are managed and more generally how combinations factors of production are implemented.

**Figure 1. Number of Examined Firms**



Financing problems, particularly differences in equity between firms of different size, may be analyzed in the light of the above choices, especially those relating to investment. By examining the basis of a firm's profitability, it is possible to determine whether financing and credit access difficulties experienced by MSEs are due to the fact that their performance is insufficient compared with that of larger firms. Many other factors independent of the lack of equity as such may undermine the health of a firm. These may include, for example, poorly targeted investments or investments that take too long , or longer than forecast, to produce a return. This leads to an increase in the enlarged debt ratio to finance the delay in the return on investment and an inability to meet debt servicing payments due to insufficient wealth creation. The loss of one or several markets can also cause serious difficulties, in the same way as an excessive dependence on customers or suppliers. For this reason reference to the industry's

performance is vital. However, in this preliminary study we do not incorporate and aggregate industrial performance data.

There are two approaches to performance measurement. The first and easier is to compare actual cash flow with forecasted cash flow. The second is to compare actual profitability with the opportunity cost of capital. The second approach is difficult and risky. Most firms measure performance in terms of accounting or book profitability. Unfortunately book income and return on income are often seriously biased measures of true profitability and thus should not be directly compared to the opportunity cost of capital. In principle true or economic income is easy to calculate. In this survey we have calculated two measures of firm performance and profitability:

- The Returns on Equity (%) and,
- The Debt to Total Assets

The Returns On Equity (ROE) measure or net financial profitability is the ratio between the self financing capacity (after tax) and shareholder's equity. Shareholder contributions make up the share capital which, together with the reserves of undistributed profits from previous years and earnings for the current year, constitute the shareholder's equity. Equity is a broader notion than 'share capital' as it includes shareholders contributions which differ from 'share capital' in the sense that they confer voting rights as well as other stable funds without voting. The Debts to Total Asset Ratio is a leverage ratio showing how heavily the firm is in debt.

### **3. Results and Discussion**

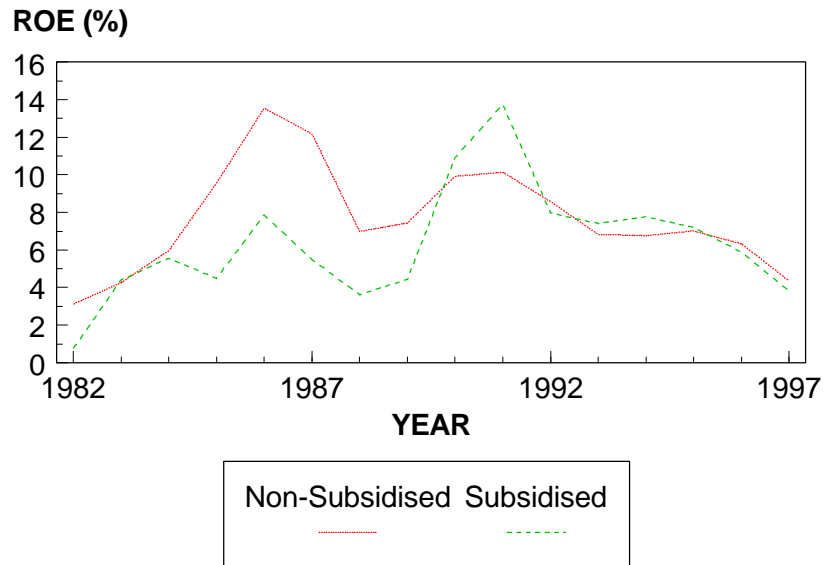
In order to examine the differences between subsidised and non-subsidised firms as concern profitability we calculated the median of the ROE and Debt to Total Assets measures. Figures 2 and 3 show the evolution of the time series for the two measures and the two criteria.

Non-subsidised firms present higher ROE for the period 1982 to 1990. Since then, however, subsidised firms equalised and overpassed non-subsidised firms. In the last two years of the study period under consideration ROE was almost equal for the two groups of firms. This profitability measure is used to judge how efficiently the firm is using its assets. Due to the fact that the subsidy runs through the profit-loss account of the firm and affects the profitability calculations, one may assume that subsidies assisted supported firms to improve their financial position and more specifically their profitability. Finally, it should be noted that, a formal test (t-test, or non-parametric test for equality of means) does not reject the hypothesis of equality of the mean ROE between the two groups of firms for almost every year.

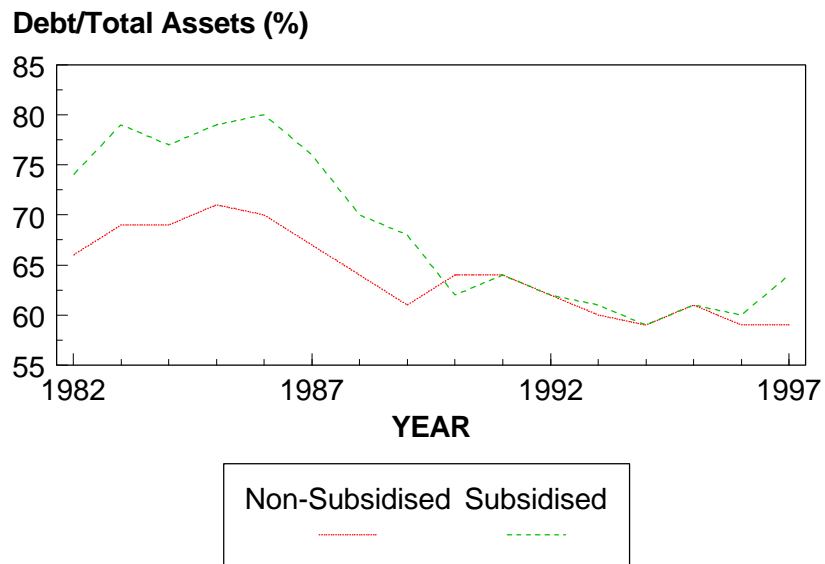
From an examination of the median Debt to Total Assets Ratio shown in figure 3, useful indications are drawn. Between 1982 and 1990, subsidised enterprises appear to be more in debt than non-subsidised firms. In 1991 to 1997, it appears to be only small difference between the two firm categories. Financial autonomy of subsidised firms rose substantially between 1982 and 1990. The subsidy represents an additional cash-flow which is assumed to strengthen the solvability position of a firm. We observe, however, that there is considerable variability in the time series of the ratio. We ascertain that the sources of variability should be searched within the sector and the

incorporation of sector specific data will allow a further refinement of the reasons causing the observed debt to total assets variation. Finally, it should be noted that, a formal test (t-test, or non-parametric test for equality of means) does not reject the hypothesis of equality of mean of debt to asset ratios between the two groups of firms for almost every year.

**Figure 2. Median Return on Equity**



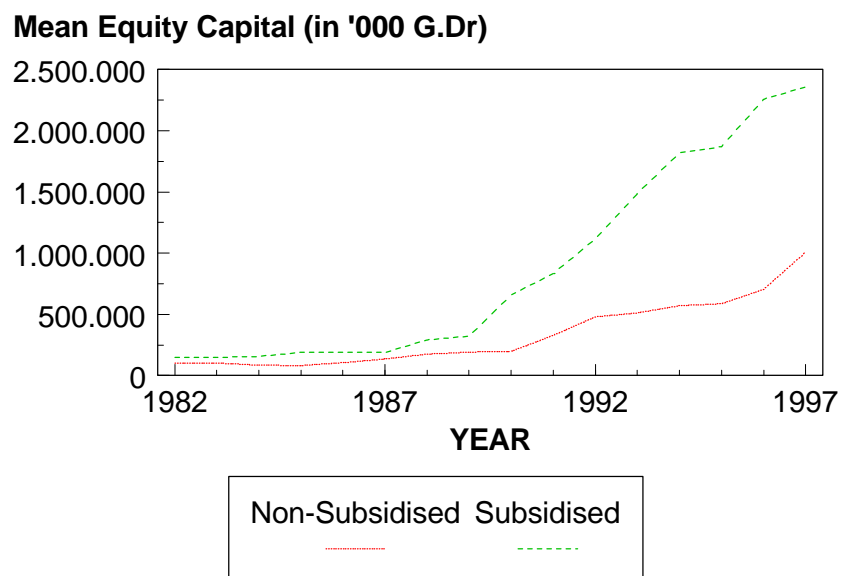
**Figure 3. Median Debt to Total Assets (%)**



The debts to total assets ratio (i.e the firm's leverage) is closely connected to the concept of additionality. Additional subsidies rise the firm's leverage by intensifying the firm's search for raising capital. However, when investment is not additional, then subsidies act as a substitute to the firm's own capital and the leverage is reduced. This point calls us to examine further the relationship between the ex-ante and ex-post levels of leverage in relation to subsidisation. Furthermore, when examining the effect of subsidies on leverage, we should include other variables assumed to influence the firm investment behaviour and the firm's position towards additionality.

One major conclusion of our research, however, concerned with the difference in the size of subsidised and non-subsidised firms. On the contrary of what it is widely acknowledged for the regional development framework, we found that among the examined firms (limited companies of the Food-Beverages sector) the subsidised firms are considerably larger in financial size than the non-subsidised firms. We run a series of tests on key variables indicative of financial size. Figure 4 presents the time series for the mean equity capital for subsidised and non-subsidised firms. In the period 1982 to 1987 the difference is not very large. From 1987 onwards, the difference widens significantly and ends up in 1997 to be very high (almost 2 billion Greek drachmas). Of course, one may argue that the difference builds upon the received subsidies. However, we observe a consistent pattern in the difference of size as this is revealed by total assets, fixed assets, liquid assets, etc. Regional development policy in many European countries has been criticized for been discretionary towards larger firms that have the human capital and resources to prepare applications for subsidisation. This indication should be examined under a wider econometric framework that will include a range of factors influencing investment behaviour of firms.

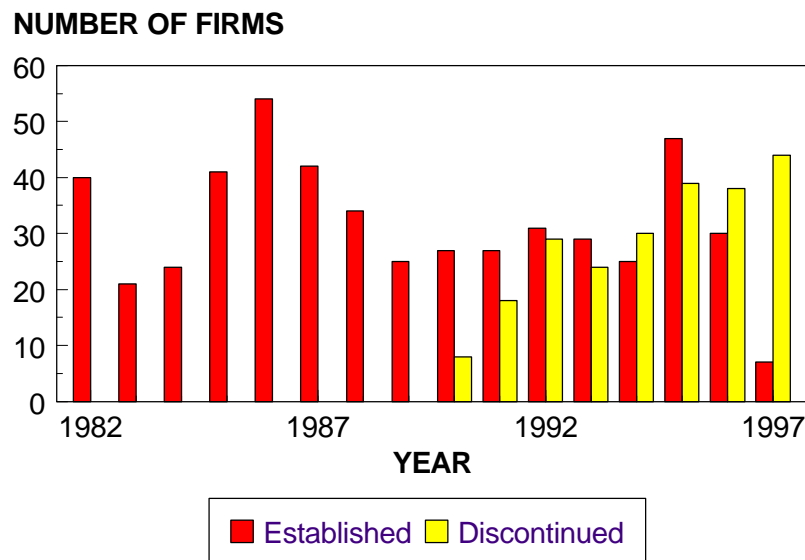
**Figure 4. Mean Equity Capital**





Firm birth and death (survival rates) were studied from the total sample of firms, subsidised and non-subsidised included. Figure 5 shows the actual number of firms that were established or discontinued operation during the period under consideration. The period 1982 to 1990 is characterised by consistent firm birth, having a peak in 1986. Firm closures are observed after 1990 with increasing rate. In total we found that a number of around 260 firms discontinued their operation in the period 1990 to 1997, of which, only 4 had received a subsidy. This provides strong evidence that the regional grant aid incentives contribute towards firm survival. However, a deeper examination of the birth and death patterns calls for an econometric model that will attempt to identify and isolate the various factors influencing firm survival.

**Figure 5. Number of Firms Created and Discontinued**



#### 4. A Future Research Agenda

Future research in the subject should be extended to various areas covering:

- A theoretical model of the investment behaviour of firms under grant aid
- An integrated econometric approach testing:
  - The performance and profitability of subsidised versus non-subsidised firms
  - The effects of grant-aid on firm survival

A theoretical model of investment behaviour under the grant-aid regime should be based on investment models already proposed in the international bibliography. Grant-aid may be introduced in investment models as another source of finance (Blundell et al., 1992; van Tongeren, 1998). Another theoretical model attempts to identify the role of financing sources on the firm's investment decisions using a hierarchy of finance (Bond and Meghir, 1994).

The econometric approach to examine performance and profitability should extend the utilised indices of ROE and debts to total assets to include indices that reflect the firm's financial structure, financial efficiency and liquidity as this has been defined and used by many financial researchers (Paranque, 1997; Bacidore et al., 1996). In doing so, the databases should be extended to include industry specific data, while the models should use a wide range of firm specific data. The econometric methods to be used should utilise unbalanced panel data analysis to facilitate for the unequal number of firms in each year.

Survival and death of firms should also be examined empirically using econometric techniques that estimate the probability of surviving given a range of covariates. Such models have been used to estimate the survival rate of new firms (Audretsch, 1994; Audretsch and Mahmood, 1995) and the survival of firms under article 11 of the American law for bankruptcy (Bandopadhyaya, 1994).

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