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Regional Development Policy And The Location Of Manufacturing Industry: A Greek Case Study

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**Regional Development Policy and the Location of Manufacturing Industry:
A Greek Case Study**

by

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Abstract

The operation of regional development policy incentives in Greece has attempted, among others, to diversify the economic base of the Greek regions and re-allocate the establishment of manufacturing plans. In consecutive regional development frameworks, the whole of the country was divided into regional development priority zones that differentiated the intensity of the provided financial support. Early scientific works attempted to test the hypothesis that the operation of differentiated financial incentives had an impact on the establishment and operation of manufacturing plans and consequently affected the structure and mixture of the manufacturing sector in the Greek regions.

A large database concerning over 25,000 assisted investments since 1982 of which 15,367 in the manufacturing industry, has been assembled. For the first time, the sectoral and regional characteristics of assisted investments in Greece are described.

The location of manufacturing industry is modeled through the use of location quotients of the number of assisted projects, the number of jobs created and the total investment. Early results show that the locational patterns of assisted projects are not particularly influenced by either the size of the provided assistance or the location of existing manufacturing activity. Further research is needed in the direction of more complicated regression models that will take account of a wider range of regional factors likely to influence the locational patterns of assisted projects. Furthermore, future research should distinguish the location between investments for new plans and investments for the extension, modernization or relocation of existing plans.

Introduction

The historical trend of regional imbalances in the location of the manufacturing activity in Greece is well-documented (OECD, 1981; Psycharis and Papadaki, 1996). Regional policy has employed a series of financial incentives and attempted through consecutive development frameworks to reverse and divert the locational trends in the manufacturing sectors. The main aim of regional policy was, besides job creation, to direct investments in the manufacturing sector and diversify the economic base of the regions. The state attempted, through the differentiation in the degree of grant aid among regions, to direct investments in the less developed regions and thus to affect the locational pattern of the Greek manufacturing sectors.

A wide range of factors affects the regional location of manufacturing activity. The existing location of manufacturing activity in terms of employment determines the location of future investments in the sense that new investments are either carried out by existing manufacturing plans or tend to locate in regions with a derived advantage in the operation of specific sectors. On the other hand, financial support directed to businesses signals the direction of investments into specific regions and sectors. The present paper attempts to describe the sectoral and regional impacts of two consecutive regional development frameworks applied in Greece in the period 1982-97. The paper proceeds as follows: first, a brief description of the regional development policy frameworks in Greece is presented. Second, a description of the sectoral characteristics of assisted investments is presented and the main inter-regional variation is sketched. Third, the location of investments for 17 manufacturing sectors are analyzed through the

estimation of location quotients and examples from the location of main manufacturing sectors are presented. Finally, some preliminary conclusions and directions for further research are presented.

2. Regional Development Policy in Greece 1982-97

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. Various governments have attempted to provide solutions to the issue of unbalanced regional growth in Greece. All the attempts include the use of financial and fiscal incentives to various industrial sectors. In 1949, tax incentives aiming to strengthen the industry in provinces and rural areas, were adopted by the 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 1982, the first integrated and coherent framework for regional development was introduced by Law 1262/82. Law 1262/82 provided grant aid (free capital) and interest rate subsidization to businesses, together with several fiscal incentives. Table 1

summarizes the final outcome from the application of this regional development framework.

Table 1. Results from the Application of Law 1262/82 (1982-1990).

Manufacturing Sectors	Number of Approved Plans	Employment creation	Total Investment*	Total Private Contribution*
1) Food, Beverage, Tobacco	4179	38209	240247237	89608408
2) Textiles	522	6604	42521660	15184660
3) Clothing and Footwear	1034	8873	51112729	18515927
4) Wood and Cork	619	5694	31584408	11160666
5) Furniture	510	5101	29795786	10308577
6) Paper and Printing	311	3182	16388153	5553317
7) Leather	155	1517	8273623	3104948
8) Rubber and Plastic	313	3831	15390129	5374064
9) Chemical	232	2992	21162141	8268735
10) Oil Refinement	66	713	4107797	1395490
11) Non-metallic Minerals	896	8897	57547547	20121887
12) Basic Metal Industries	100	2604	7416182	2771193
13) Metallic Products	541	4906	30056373	11734442
14) Machinery and Equipment	315	3117	21932783	7601696
15) Electric Supplies	221	1689	15208877	6363483
16) Transport Equipment	170	3921	17382235	6535992
17) Other Manufact. Sectors	164	879	6459417	2534833
Total Manufact. Sector	10348	102729	616587076	226138321
All Other Sectors	7942	61913	453523721	175105180
TOTAL	18290	164642	1070110798	401243500

*Monetary values in 1980 deflated thousand Greek Drachmas

Law 1262/82 assisted a total of 18,290 investment projects in the period 1982-90 of which 10,348 or 56.6% of assisted projects concerns projects in 17 sectors of the manufacturing industry. Assisted projects claimed the creation of 164,642 new jobs of

which 102,729 or 62.4% of all created jobs were in the 17 sectors of the manufacturing industry. The Food, Beverages and Tobacco sector accounted for the largest share of investment plans followed by Clothing and Footwear. Table 2 summarizes the purpose of the approved investment plans. In the manufacturing sector, establishment concerns about 35.9% of all assisted projects as opposed to 73% in all other sectors of the economy.

Table 2. Investment Purposes for Assisted Projects under Law 1262/82

Investment Purpose	All Investments*	Secondary Sector Only	All Other Investments
Establishment of New Plans	9531	3716	5815
Extension	5730	4571	1159
Transfer	469	387	82
Modernization	6389	4827	1562
Environmental Protection	146	103	43
Energy Saving	114	49	65
Introduction of Modern Technology	15	9	6
Total	22394	13662	8732

* Investments may claim multiple purposes and thus the total number of investment purposes does not add up to the total number of assisted projects.

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. For the investment plans approved under the regional development framework, our data end to year 1997. Table 3 summarizes the outcome from the application of this regional development framework

up to the end of 1997. Table 4 summarizes the purpose of the approved investment plans.

Table 3. Results from the Application of Law 1892/90 (1990-1997).

Manufacturing Sectors	Number of Approved Plans	Employment creation	Total Investment*	Total Private Contribution*
1) Food, Beverage, Tobacco	1690	12309	251387456	969542431
2) Textiles	287	7875	112008578	376094591
3) Clothing and Footwear	219	3420	34591520	130191279
4) Wood and Cork	241	1746	35254905	120468955
5) Furniture	212	1297	22862916	80738191
6) Paper and Printing	371	3211	88410909	319483028
7) Leather	55	698	8183508	25631694
8) Rubber and Plastic	237	3047	70418807	245716879
9) Chemical	143	1846	59313793	221427277
10) Oil Refinement	62	273	21857437	89617874
11) Non-metallic Minerals	554	4145	**	**
12) Basic Metal Industries	103	5851	67319596	237717072
13) Metallic Products	464	2862	55584181	211216043
14) Machinery and Equipment	176	1374	20156914	82159289
15) Electric Supplies	76	962	18225439	66848902
16) Transport Equipment	24	414	6226681	18877919
17) Other Manufact. Sectors	114	1551	39058575	208055899
Total Manufact. Sector	5028	52881	910861216	3403787330
All Other Sectors	2138	77149	416665728	1949711476
TOTAL	7166	130030	1327526944	5353498806

*Monetary values in 1980 deflated thousand Greek Drachmas.** Data not yet available.

In the period 1990-97, a total of 7,166 projects were approved under Law 1892/90 of which 5,028 or 70.2% concerns with sectors in the manufacturing industry, indicating a stronger trend to the assistance of manufacturing industry as opposed to the

previous regional development framework. Establishment of new plans concerns 25.4% of all projects financed in the manufacturing sector, a figure well below the corresponding figure (35.9%) of the previous regional development framework.

Table 4. Investment Purposes for Assisted Projects under Law 1892/90

Investment Purpose	All Investments*	Secondary Sector Only	All Other Investments
Establishment of New Plans	1981	1274	707
Extension	2207	1855	352
Transfer	406	357	49
Modernization	4320	3203	1117
Environmental Protection	109	96	13
Energy Saving	11	4	7
Introduction of Modern Technology	77	29	48
All Other Purposes	107	10	97
Total	9218	6828	2390

* Investments may claim multiple purposes and thus the total number of investment purposes does not add up to the total number of assisted projects.

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 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.

3. Spatial and Sectoral Characteristics of Assisted Investments in the Manufacturing Industry

In order to describe the spatial-sectoral characteristics of assisted investments in the sectors of the Greek manufacturing industry a database of all projects assisted under the two regional development frameworks was assembled. To the best of our knowledge this is the only approach to deduce an electronic database including all investments from both regional development frameworks in Greece. The database includes all relevant available information per assisted project and, where possible, the final financial outcome of the project including all amendments and changes. More specifically information is included on the financial structure of assisted projects pertaining to the project's total cost, state contribution in the form of grant aid and interest rate subsidization, source and amount of private capital (own capital, loans from private banks, capital imported from activities abroad, etc.), purpose of investment, location of investment at prefectural level (NUTSIII level), industrial sector of the assisted plan, etc.

All monetary values were deflated using a GDP deflator series constructed by the authors and with 1980 as the base year. Due to the fact that the flow of finance followed the evolution of the project installments were granted in various years of the project's construction life. However, deflation was applied to the year the project was approved and granted aid for the first time. Deflating all monetary values to a common base, we were able to aggregate projects assisted under the same regional development framework and also to draw comparisons among projects assisted in various time periods.

Our preliminary analysis focused on the differences between industrial sectors as these are revealed by their regional allocation. Thus, we estimated the mean over regions for a number of characteristics including the number of assisted projects, the number of new jobs created, the total cost of investment, the rate of grant aid, the cost effectiveness of projects measured as cost per new job and the mean size of assisted projects measured as cost per assisted investment plan. This analysis was carried out for each regional development frameworks separately. Tables 5 and 6 present the results of

the regional development framework under Law 1262/82 while tables 7 and 8 present the corresponding results for Law 1892/90.

Table 5. Mean Value of Major Characteristics of Assisted Projects per Sector,
Regional Development Framework under Law 1262/82.

Industrial Sector	Mean Values per Prefecture			Number of Prefectures
	Number of Projects	Number of New Jobs	Cost of Investment*	
Food, Beverage and Tobacco	83.6	764.2	4800	50
Textiles	10.9	137.6	890	48
Clothing and Footwear	21.5	188.8	1060	48
Wood and Cork	14.4	138.9	730	43
Furniture	10.6	113.4	620	48
Paper and Printing	6.8	77.6	360	46
Leather	4.1	43.3	220	38
Rubber and Plastic	6.8	87.1	330	46
Chemical	5.3	69.6	480	44
Oil Refinement	2.1	32.4	130	31
Non-metallic Minerals	18.3	181.6	1170	49
Basic Metals Industry	2.5	70.4	190	40
Metalic Products	11.5	104.4	640	47
Machinery and Equipment	7.2	72.5	500	44
Electric Supplies	4.9	40.2	340	45
Transport Equipment	4.0	103.2	410	42
All Other Manuf. Industries	4.2	26.6	170	39

* in million Greek drachmas at 1980 values.

The Food, Beverages and Tobacco sector is by far the largest contributor to new jobs and total investment at prefectural level followed by the clothing and footwear industry and the non-metallic minerals for the period 1982-90. At the same time, the cost per new job in the Food, Beverages and Tobacco sector is the second lowest and

the percentage of financial assistance finally granted to the sector extremely high (65.0%).

Table 6. Mean Value of Financial Support, Size and Cost Effectiveness of Assisted Projects per Sector, Regional Development Framework under Law 1262/82.

Industrial Sector	Mean Values per Prefecture			Number of Prefectures
	% of Financial Assistance	Cost per New Job	Cost per Investment	
Food, Beverage and Tobacco	65.0	6437920	49894480	50
Textiles	65.2	9445990	77210270	48
Clothing and Footwear	63.4	7361030	46905560	48
Wood and Cork	65.1	8987250	55864920	43
Furniture	64.6	6780570	63321700	48
Paper and Printing	65.4	7952490	50417210	46
Leather	65.0	7730360	58394890	38
Rubber and Plastic	65.2	7001440	41423980	46
Chemical	62.5	7959260	70883080	44
Oil Refinement	66.4	6767880	53685330	31
Non-metallic Minerals	65.2	7369880	53739090	49
Basic Metals Industry	62.8	6193540	64553830	40
Metalic Products	62.5	7015270	65832190	47
Machinery and Equipment	64.7	8207290	65071140	44
Electric Supplies	61.8	10347100	67029190	45
Transport Equipment	64.9	7907690	117262380	42
All Other Manuf. Industries	63.0	6925090	32261130	39

The Food, Beverages and Tobacco sector continues to be the most important sector in terms of number of projects and total cost of investments in the period 1990-97. However, the number of new jobs per investment plan in the sector is the second

largest The cost per new job in the Food, Beverages and Tobacco sector is the third largest, outperformed by the textiles and basic metals industry.

Table 7. Mean Value of Major Characteristics of Assisted Projects per Sector,
Regional Development Framework under Law 1892/90.

Industrial Sector	Mean Values per Prefecture			Number of Prefectures
	Number of Projects	Number of New Jobs	Cost of Investment*	
Food, Beverage and Tobacco	33.1	241.4	4930	51
Textiles	8.0	254.0	3110	36
Clothing and Footwear	6.6	114.0	1050	33
Wood and Cork	5.1	40.6	750	47
Furniture	4.8	29.5	520	44
Paper and Printing	7.9	78.3	1880	47
Leather	2.5	33.2	370	22
Rubber and Plastic	6.1	78.1	1810	39
Chemical	4.2	55.9	1740	34
Oil Refinement	2.4	18.2	840	26
Non-metallic Minerals	11.1	84.6	***	50
Basic Metals Industry	4.1	254.4	2800	25
Metalic Products	9.5	62.2	1130	49
Machinery and Equipment	4.6	40.4	530	38
Electric Supplies	3.2	43.7	760	24
Transport Equipment	2.4	46.0	620	10
All Other Manuf. Industries	3.6	73.9	1260	32

* in million Greek drachmas at 1980 values.

The Clothing and Footwear sector retains the lowest cost per new job created while the cost in the Food, Beverages and Tobacco sector has increased by more than three times. The percentage of financial assistance that was granted to investment project is, on average, 10% lower in this regional development framework. The mean

cost per investment is also higher in this regional development framework indicating a rise in the size of assisted projects.

Table 8. Mean Value of Financial Support, Size and Cost Effectiveness of Assisted Projects per Sector, Regional Development Framework under Law 1892/90.

Industrial Sector	Mean Values per Prefecture			Number of Prefectures
	% of Financial Assistance	Cost per New Job	Cost per Investment	
Food, Beverage and Tobacco	54.9	22332610	134617190	51
Textiles	57.7	21559620	296800490	36
Clothing and Footwear	54.8	9640580	107348200	33
Wood and Cork	53.7	30601830	99987000	47
Furniture	56.9	20562460	75858620	44
Paper and Printing	57.3	91943420	248007920	47
Leather	57.3	13396440	127254640	22
Rubber and Plastic	57.4	29602740	250740420	39
Chemical	53.7	36955390	306485700	34
Oil Refinement	52.3	96891570	283152290	26
Non-metallic Minerals	56.1	***	***	50
Basic Metals Industry	55.0	25028160	485282520	25
Metalic Products	58.4	23649710	90164470	49
Machinery and Equipment	52.8	16907000	114580790	38
Electric Supplies	57.9	20703070	188220670	24
Transport Equipment	60.3	24305640	194834180	10
All Other Manuf. Industries	52.1	26200150	334600940	32

4. The Location of Assisted Investments in Greek Manufacturing Sectors

The location of assisted investments was examined through the derivation of location quotients for the number of assisted projects, the number of new jobs, and the total size of the investment. For each one of the 17 industrial sectors and for each of the two regional development frameworks we computed the following location quotients:

$$QL = A_{ir} / A_r / A_{in} / A_n$$

where QL is the estimated location quotient, A_{ir} is the examined characteristic of sector i at region r (number of assisted projects, number of new jobs, total investment), A_r is the examined characteristic for all sectors at region r , A_{in} is the examined characteristic for sector i at national level and A_n is the examined characteristic for all sectors at national level. Location quotients larger than one indicate that the share of the characteristic at regional level (share of number of projects in sector i out of total number of projects in all sectors) is larger than the share of the same characteristic at national level. Thus, the estimated location quotients are independent of the scale of the sector or the region and make direct reference to national figures. In the appendix of this paper we show the regional variation of estimated Location Quotients for the Food, Beverages and Tobacco Sector and for the number of new jobs for the two regional development frameworks (maps 1 and 2).

Location quotients are descriptive tools and cannot explain why the observed variation occurs. In order to test whether the location of assisted projects is influenced by the size of provided assistance, we correlated the estimated location quotients for the number of new jobs and for the total investment for each sector, with the percentage of assistance granted to each sector in each region. Almost none of the correlation coefficients were found to be statistically significant. Thus the hypothesis that the size of assistance provided affects the locational patterns of assisted projects cannot be accepted. In order to test whether the location of assisted projects is influenced by the existing location of the sector, we again correlated the estimated location quotients with the location quotients of total employment at 1981 and 1991 respectively for each regional development framework, each sector and region. Almost none of the correlation coefficients were found to be statistically significant. Thus, the hypothesis that the existing location of manufacturing activity influences the locational patterns of assisted projects cannot be accepted.

5. Preliminary Conclusions and Future Research Directions

Regional development policy in Greece has assisted a significant number of projects across the spectrum of all industrial sectors in the in the period 1982-97. The size of assistance, the number of projects, and the total size of investments were very high and able to influence the locational pattern of the Greek manufacturing industry. The analysis of location through the use of location quotients showed that various sectors present distinct locational patterns. However, the location of assisted projects in various sectors of the manufacturing industry was not found to be correlated to either the location of existing manufacturing industry or the percentage of granted aid. The analysis of all investment projects (pooled) may mask the difference in location that may emerge from a separate analysis of the location of investments establishing new plans and investments extending, modernizing or reallocating existing investments plans.

Future research should be directed in two fields. First, future analysis should take into account the fact that a wide range of factors other than the location of existing manufacturing activity or the percentage of granted aid might influence the location of assisted projects. Factors that are related to the region's human capital (demographic and educational conditions), infrastructure, quality of life and others might adequately describe the locational patterns of assisted projects. Furthermore, the analysis should distinguish between investments to new and existing plans. Finally, the analysis should be extended to account, besides the location of assisted plans, for the concentration and specialization of assisted projects in the sectors of the manufacturing industry.

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Appendix

The Location of New Jobs for the Food, Beverages and Tobacco Sector for the 1262/82 and 1892/90 Regional Development Frameworks.



