ΕΛΕΓΧΟΣ
ΣΠΟΥΔΑΙ

Τριμηνιαία Επιστημονική Έκδοση της Ανωτ. Βιομηχανικής Σχολής Πειραιάς

ΕΤΟΣ **1986** ΙΑΝΟΥΑΡΙΟΣ-ΔΕΚΕΜΒΡΙΟΣ 1986 ΑΡΙΘΜ. 1-4
ΕΤΟΣ 1986 | ΤΟΜΟΣ ΤΕΥΧΟΥΣ

PATTERNS OF GROWTH DIFFERENTIALS IN MANUFACTURING EMPLOYMENT: NORTHERN GREECE

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1. INTRODUCTION

The sustained substantial differences in growth rates observed among regions has in the latter part of the century, received a good deal of attention from economists and policy makers. Particularly, the attention has been focussed on theoretical issues related to differences in : (1) political and economic institutions ; (2) structural changes ; and (3) causal factors, including timing and amplitude of business fluctuations that may either reproduce or perpetuate the differential performance among the regions or close the disparity gap. Despite the theories and policy measures, regional socio-economic imbalances persist and the understanding of the regional process remains limited. This, among other things, can be attributed to : (1) the lack of a general theory that incorporates all factors of regional growth (such as resource availability and mobility, regional comparative advantages, technology, market imperfections and appropriate/inappropriate development policies) ; and (2) the fact that there has been no systematic study and formal testing of economic growth among the regions of a nation.

The purpose of this paper is to : (1) analyse on a comparative static basis, the growth differentials in manufacturing employment in northern Greece ; (2) identify the causes of the observed disproportional economic performance of the individual regions of northern Greece relative to the national and northern ave-

rages; and (3) propose, on the basis of the findings, policy measures designed to reduce regional economic disparities.

The paper is subdivided into five main sections. Section 2 presents a synoptic overview of the changing economic performance in the various regions examined. Section 3 discusses the methodological approach adopted as well as data source and utilization. Section 4 focusses on the empirical estimation of the model and critically evaluates the findings. Section 5 extends the analysis in Section of the model and critically evaluates the findings. Section 5 extends the analysis in Section 4 to include a discussion on policy measures. Finally, summaries, conclusions and suggestions for further investigation are discussed in Section 6.

2. REGIONAL ECONOMIC DISPARITIES : AN OVERVIEW

Greece, as is the case of most less-developed nations, is characterized by a wide disparity gap between a few growing industrial centres and declining or stagnating rural and semi-urban areas. The evidence is striking. A conclusive feature of the spatial structure of the Greek economy is the heavy concentration of population, industry, commerce and public services in the departments (nomos) of Attica and Salonica. Of a total population of 9.7 million in 1981 [Population Census, 1981], 58.4% lived in two regions (East-Central Greece and Macedonia), with one-third living in Athens and its suburban fringes. This disproportional distribution as well as the composition (urban vs non-urban) of the nation's population can be related to the wide differentials observed in regional employment and production growth rates.

In the time period extending from 1961 to 1981, total employment and the economic active population delined by 1.2 and 2.8 % respectively in Greece. With the exception of two, all regions experienced negative percentage changes ranging from -0.87 % in Thessaly to -60.0 % in East Macedonia. In the same (1961 - 1981) time period the increase in secondary and tertiary employment was insufficient to offset the significant employment decline in regional primary activity.[1].

The disproportional distribution of employment among regions and the diversity in labor composition among the sectors of the regional economies can be attributed to different growth rates and levels in regional production. In the 1970-1979 time period, regional production, measured on the basis of Gross Domestic Product (GDP), increased in all regions and the regional growth rates were compa-

1. Reflecting the case for population, it should be noted that employment is highly concentrated in East-Central Greece and Macedonia and the upward trend in secondary and tertiary employment was unevenly distributed among the various regions of the nation.

rable to the national average. However, the distribution and sectoral composition of the nation' s GDP by region reflected the patterns observed for population and employment. The share of national GDP by the two dominant regions together increased from 63.6% to 65.2% between 1970 and 1979. In 1979, the remaining regions, representing 24.6 % of the nation's population and 43.8 % of national employment, only produced 34.6 % of the total with the remainder accounted for the tertiary and secondary sectors.

The significance of the disparity gap among the regions is further illustrated by a comparison of rural and non - rural GDP per capita. With the exception of the department of Attica, all regions experienced low rural to non - rural ratios, with the rural share representing 8.7 and 32.0% of total GDP in 1970 and 1979 respectively.

Socio-economic inter - regional imbalances continue to be an issue of contention in Greece. Furthermore, despite well defined regional development goals neither market forket forces nor government policies have been able to significantly reduce the disparity gap and promote regional balanced growth.

3. THE THEORETICAL MODEL

The methodological approach used in this paper is the Shift-Share Model (hereafter SS - M). Conceptually, in its original formulation, the SS-M has been utilized to break down the growth in employment (or output) in an industry (or region) into three components : (1) the national growth component (hereafter NG-C), defined to be the growth that would have occured in regional employment (output) if industries in the region had experienced the same growth rate as the national average ; (2) the industrial - mix component (hereafter IM - C), whit measures the growth in employment (output) attributed to whether the region is characterized by a predominance of national rapid growth industries (positive IM-C); or declining industries at the national level (negative IM - C); and (3) the regional share component (hereafter RS-C), which measures the extent to which additional employment (output) growth in a specific industry is the outcome of that industry growing in the region at a rate different from the national industry growth rate. It points to the presence of regional or locational advantages (disadvantages) that enable regional industries to grow at faster (positive RS-C), or slower (negative RS-C) rates than if located in other regions (Edwards,

1976][2] The industry's (region's) changing position relative to the rest of the country is measured by the net relative change (hereafter NR-C) which is given by the sum of the IM - C and RS-C.

The SS - M, outlined above, can be measured by the following identity :

$$\Delta E = \sum_{i=1}^{m} r_{oo} e_{ij} + \sum_{i=1}^{m} (r_{io} - r_{oo}) e_{ij} + \sum_{i=1}^{m} (r_{ij} - r_{io}) e_{ij} \qquad [1]$$

s.t.

$$\Delta E \gtrless 0, \quad \sum_{i=1}^{m} r_{oo} e_{ij} \lessgtr 0, \qquad i = 1, \ldots, m$$

$$\sum_{i=1}^{m} (r_{io} - r_{oo}) e_{ij} \gtrless 0, \quad \sum_{i=1}^{m} (r_{ij} - r_{io}) e_{ij} \lessgtr 0$$

Equation [1] suggests that the actual change in employment in a region, ΔE, equals the summation of the NG-C, $\sum_{i=1}^{m} r_{oo} e_{ij}$, the IM-C, $\sum_{i=1}^{m} (r_{io} - r_{oo}) e_{ij}$, and the RS-C, $\sum_{i=1}^{m} (r_{ij} - r_{io}) e_{ij}$.

Where

e_{ij} is the employment in the ith industry and the ith region.

r_{00} is the actual national employment growth rate.

2. It has been proposed elsewhere [Andrikopoulos, 1977, 1978a, 1978b, 1980], that the RS-C is the dynamic element of regional growth and, therefore, more important than the IM-C for regional planning and development. This further suggests that policy measures designed to correct regional imbalances should be formulated on the basis of the region's comparative advantages.

r_{io} is the growth in the ith industry nationally and.

rij reflects the rate 01 growth in the ith industry regionally.

The term ΔE measures the actual change in employment in the jth region and m is the number of industries in region j. [3].

The SS - M]Equation (I)] has been the subject of numerous enpirical tests. However, the results have been mixed and on the whole, inconclusive. To begin the SS - M was criticized on conceptual grounds [Houston 1967] as well as on its inability to provide convincing explanations as to why the industrial structure of a region is different to that of the nation or why the growth (decline) of regional industries is different from the national average [Brown 1969; Parie, 1970; Buck, 1970; Stilwell, 1969]. Nevertheless, recent investigations, including those of Hellman [1976], and Chalmers and Beckhelm [1976], as well as modifications and extension of the SS-M including those by Andrikopoulos [1980] and Buck and Atkins [1983] provide the basis for employing the model not only as adescriptive tool but most importantly for predicting regional expansion paths of employment and output and as a guide for policy analysis [4].

The SS - M, for the purposes of this paper, was estimated for three major regions (Epirus, Macedonia, and Thrace) which were further subdivided into twenty administrative departments 5. Employment data for two-digit manufacturing industry and for the years 1963, 1969, 1973 and 1978 were used for the estimation. The data was obtained from the manufacturing censuses [National Statistical Service of Greece, 1963, 1969, 1973 and 1978].

3. The SS-M is significant in that it summarizes the effects of three major factors on the growth performance of a regional economy (or an industry). These include : (1) national factors as summarized by ri_0 and r_{o0} ; (2) local factors, as summarized by rij ; and (3) differential factors, as summarized by $ri_0 - r_{o0}$ and $rij - ri_0$. In other words the SS-M demonstrates that the growth of a region's economy can be attributed to a combination of factors including exogeneous or national factors, the initial economic structure as well as size and differential factors.

4. For further discussion of the SS-M and its variants see also Whipple [1966], Tihanyi [1966], Beaud [1966], Thirlwall [1967], Floyed and Sirmans [1973, 1975], Steed [1967], Randall, [1973], Maddox and Liebharsky [1967], Estban - Marguillas [1972], James and Hughes [1973] Klassen and Paelinck [1972], Sakashita [1973], Zimmerman [1975], and Ireland and Moomaw [1981].

5. These departments include : Arta, Thesprotia, Ioannina, Preveza, Grevena, Drama, Imathia, Salonica, Kavala, Kastoria, Kilkis, Kozani, Pella, Pieria, Serres, Fiorina, Chalkidiki, Xanthi, Evros and Rodopi.

4. APPLICATION OF THE SHIFT - SHARE MODEL

The SS - M [Equation (1)] was estimated by comparing the growth performance of the individual northern regions to that of : (1) the nation's average ; and (2) the overall average of the north. For the purpose of evaluating structural changes, the model was estimated for three time periods (1963 - 1969, 1969 - 1973 and 1973 - 1978).

4.1. North Relative to the Nation's Average

Table 1 reports the actual employment in manufacturing by region and the corresponding growth components for the three time periods considered. On a broad comparative basis, only two regions (Grevena and Kozani) in the 1963-1969 time period, two regions (Kastoria and Kozani) in the 1973 -1978 period and four regions (Salonica, Kavala, Kastoria and Kozani) in the 1973-1978 time period, experienced positive IM-C. In contrast, in the 1963-1969 time period, two regions in Epirus (Arta and Preveza), six regions in Macedonia (Grevena, Imathia, Salonica, Kastoria, Kozani, Pella and Pieria) and two regions in Thrace (Evros and Rodopi)were found to be relatively competitive (positive RS-C), when the basis for comparison was the national average.

The observed performance of the regions changed slightly in the 1969-1973 as compared to the earlier two periods. Specifically, Arta, Imathia, Kastoria, Pella and Evros retained their competitive position (RS - C > 0), Thesprotia, Ioannina, Kilkis, and Fiorina became more attractive regions, and the remaining geographical departments became either less attractive regions (RS - C < 0) or retained the «disadvantage» growth performance of the 1963-1969 period [Table 1). Substantial changes, however, are observed in the 1973 -1978 period. Seventeen of twenty geographical departments experienced positive RS -C [Table 1].

In respect to overall regional growth patterns, as indicated in Tablel,the NRC-Cwas positive in ten regions in 1963-1969, seven regions in 1969-1973, and fifteen regions in 1973-1978. This suggests that these regions experienced faster rates of growth in manufacturing employment in comparison to the national average. This differential performace can be attributed to the existence of fast growing industries at the national level (positive IM-C) in the regions in question, the ability of these regions to attract industries because of locational advantages (RS-C>0), or a combination of both.

TABLE 1

Regional growth patterns in manufacturing employment : Northern Greece relative to Nation's Average (1963 - 1969, 1969 - 1973, 1973 - 1978)

		Regions	Employment: 1963	Growth Components: 1963-1969 N.G	I.M	R.S	NRC	Employment: 1969	Growth Components: 1969-1973 N.G	I.M	R.S	NRC	Employment: 1973	Growth Components: 1973-1978 N.G	I.M	R.S	NRC	Employment: 1978
A.		EPIRUS	6969	444	-122	438	307	7716	1578	-319	435	114	9409	1054	-423	98	-325	10138
	1.	Arta	1242	79	-24	654	630	1950	399	-111	208	96	2445	274	-87	608	-695	2024
	2.	Thesprotia	687	44	-18	-100	-117	613	125	-27	85	57	796	89	-20	7	-13	872
	3.	Ioannina	3883	247	-53	-178	-231	3898	797	-141	436	295	4990	559	-283	151	-132	5417
	4.	Preveza	1157	74	-27	52	25	1255	257	-40	-294	-334	1178	132	-33	548	515	1825
B.		MACEDONIA	89614	5693	-3006	10105	7099	102407	20936	-2603	-1438	-4042	119299	13451	12	15652	15664	148312
	5.	Grevena	20	1	4	769	773	795	163	-35	-131	-166	791	89	-25	29	4	883
	6.	Drama	4988	317	-127	-2321	-2448	2857	584	-187	-603	-790	2651	297	-86	2682	2596	5544
	7.	Imathia	4988	317	-127	203	76	5381	1100	-153	2198	2045	8526	955	-224	653	428	9909
	8.	Salonica	46531	2956	-1366	11158	9792	59280	12118	-965	-1146	-2111	69287	7758	138	5702	5840	82885
	9.	Kavala	7487	476	-826	-188	-1014	6949	1421	-818	-1304	-2122	6248	693	39	1035	1074	8015
	10.	Kastoria	3936	250	-105	1264	1159	5345	1093	221	724	944	7382	827	505	192	697	8905
	11.	Kilkis	1891	120	-61	-421	-482	1529	313	-46	39	-7	1835	205	-11	1694	1683	3723
	12.	Kozani	4932	313	18	611	629	5874	1201	65	-983	-918	6157	689	254	-687	-433	6413
	13.	Pella	3506	223	-79	323	244	3972	812	-108	675	567	5351	599	-214	1719	1505	7455
	14.	Pieria	2184	139	-106	171	65	2388	488	-99	-158	-257	2619	293	-64	531	467	3379
	15.	Serres	6504	413	-182	-1235	-1417	5500	1124	-389	-542	-931	5693	637	-213	1795	1583	7913
	16.	Florina	1245	79	-2	-211	-213	1111	227	-44	97	53	1391	156	-43	-304	-347	1200
	17.	Chalkidiki	1402	89	-47	-18	-65	1426	292	-45	-304	-349	1368	153	-44	611	567	2088
C.		THRACE	7874	500	-276	-144	-420	7955	1626	-353	-1391	-1744	7837	878	-279	3373	3094	11809
	18.	Xanthi	3692	235	-16	-435	-451	3476	711	-68	-860	-928	3258	365	-146	1218	1072	4695
	19.	Evros	2052	130	-183	14	-169	2013	411	-227	52	-175	2250	252	-57	1825	1768	4270
	20.	Rodopi	2130	135	-77	277	200	2466	504	-58	-583	-641	2329	261	-76	330	254	2844

Source: Estimated from: Statistical Service of Greece, Manufacturing Censuses, 1963, 1969, 1973, and 1978. Where: N.G = National Growth; I.M = Industrial Mix; R.S = Regional Share; and NRC = Net Relative Change.

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4.2. Northern Regions Relative to the North's Average

The differential growth pattern of the individual geographical departments of the north relative to the northern average are reported in Table 2. Generally, structural changes occurred in all geographical departments in Epirus. The structural break occurred in the 1973-1978 time period as noted by the IM-C which went from positive in 1963-69 and 1969-1973 to negative in 1973-1978. Of the **four** geographical departments located in Epirus, Arta was the most attractive area in the 1963-1969 period (RS-C > 0). Preveza was the less attractive in the 1969-1973 period (RS-C < 0) and most attractive in the 1973-1978 period (RS-C > 0). However, on the basis of the NRC-C, Arta (1963-1969), Thesprotia and Ioannina (1969- 1973), and Preveza (1973-1978), grew faster than the overall northern average.

In Macedonia, four regions in the 1963- 1969 period, six regions in the 1969-1973 period and seven in the 1973-1978 period, experienced a positive NRC-C This can be attributed to the IM-C which was sufficiently strong to offset the negative RS-C or the locational attractiveness of certain regions which compensated for the weak industrial structure (IM-C < 0). In Thrace, two regions in the 1963-1969 period, all regions in the 1969- 1973 period and one region in the 1973- 1978 period, experienced a negative growth performance.

A cross comparison of the figures in Tables 1 and 2 reveals that, other things being equal, the geographical departments of the north performed more satisfactorily when their growth patterns were estimated on the basis of the north's as compared to the nation's average. This is especially the case in the first and last periods of study.

A better understanding of the observed growth differential patterns among the sampled regions requires a more detailed investigation of the nature of the industries located in each of the individual geographical departments in the north. Insights related to the nature of northern regional manufacturing industries are discussed in the following section.

5. INDUSTRIAL REGIONAL CHARACTERISTICS AND POLICY ANALYSIS

5.1. Industrial Regional Characteristics

Three basic criteria have been used to identify the nature of the industries in each individual region of the North : (1) the degree of specialization of the geograp-

TABLE 2

Gegional growth patterns in manufacturing employment : Northern Greece
Relative to "Northern Greece,, Average (1963 - 1969, 1969 - 1973, 1973 - 1978)

		REGIONS	REGIONAL GROWTH COMPONENTS IN MANUFACTURING EMPLOYMENT											
			1963-1969				1969-1973				1973-1978			
			N.G	I.M	R.S	NRC	N.G	I.M	R.S	NRC	N.G	I.M	R.S	NRC
A.		EPIRUS	1053	1122	-1426	-306	1286	145	261	406	2121	-498	-894	-1392
	1.	Arta	188	427	94	520	325	97	73	170	551	-103	-869	-972
	2.	Thesprotia	104	205	-382	-177	102	22	58	80	179	-22	-81	-103
	3.	Ioannina	586	289	-861	-572	650	4	438	442	1125	-337	-361	-698
	4.	Preveza	175	201	-277	-77	209	22	-308	-286	266	-36	417	381
B.		MACEDONIA	13625	2585	-3417	-833	17148	361	-617	-258	26879	740	1394	2134
	5.	Grevena	95	233	538	771	193	19	-156	-137	178	-39	-47	-86
	6.	Drama	753	-3	-2881	-2884	477	-177	-505	-683	998	-45	2341	2295
	7.	Imathia	753	-3	-357	-360	898	299	1948	2247	1922	-325	-214	-539
	8.	Salonica	7027	780	4941	5721	9892	-170	286	115	15219	753	-2775	-2022
	9.	Kavala	1131	-702	-967	-1669	1160	-850	-1071	-1921	1395	105	267	372
	10.	Kastoria	594	806	9	815	892	906	239	1145	1664	639	-781	-141
	11.	Kilkis	286	198	-846	-648	255	42	8	50	414	52	1423	1474
	12.	Kozani	745	576	-378	197	980	-44	-653	-697	1388	134	-1266	-1132
	13.	Pella	529	144	-207	-63	663	365	351	716	1206	-267	1165	898
	14.	Pieria	330	141	-267	-126	398	-45	-122	-167	590	-58	227	170
	15.	Serres	982	24	-2101	-2077	918	-6	-719	-725	1283	-136	1073	937
	16.	Florina	188	219	-541	-322	185	-3	98	95	314	-49	-455	-504
	17.	Chalkidiki	212	172	-360	-188	238	25	-321	-296	308	-24	436	412
C.		THRACE	1188	392	-1500	-1109	1327	-213	-1233	-1446	1707	-270	2535	2265
	18.	Xanthi	556	220	-993	-774	580	-3	-795	-798	675	-191	953	762
	19.	Evros	310	11	-360	-349	336	-182	83	-99	507	-32	1545	1513
	20.	Rodopi	322	161	-147	14	411	-28	-521	-549	525	-47	37	-10

Source : Ibid Table 1.

hical departments[6]. (2) the proportion of employment in highly concentrated industries[7], and (3) the relative economic growth performance of each individual industry». Table 3 summarizes the regional industrial characteristics. Firstly, the figures indicate that in all geographical departments except Kastoria, the specialization coefficients are relatively low. This is the case not only when the basis of comparison was the national average but also the northern average. The low specialization coefficients suggest that the sampled regions are «diversified», small - size, and «inefficient - type» operations[9]. Secondly, the bulk of manufacturing employment is absorbed by a small number, but highly concentrated industrial sectors, that is, sectors experiencing a location quotient greater than onei[10]. Thirdly, the majority of the industrial sectors in each region displayed a negative performance ($NR-C<0$, Table 3). The negative performance can be attributed mainly to the regions' comparative disadvantages and consequently, their inability to attract economic activities. This is supported by the findings summarized in Tables I and 2. When compared to the national average, although fifty percent or more of the industries experienced a positive industrial mix, the negative competitive effect

6. The degree of regional specialization is measured by the specialization coefficient which is defined as :

$$S_c = 1/2 \sum_{i=1}^{n} \left| \left[(e_{ij}/\varepsilon_j) - (\varepsilon_i/\varepsilon) \right] \right|$$

with $0 < S_c$ 1. Where eij = employment in the ith industry regionally, εj = total regional employment, εi = total employment in the ith industry nationally, and ε = total national employment.

7. The measure used to identify the highly concentrated industries in each region is the location quotient. It is defined as :

(LQ)i=[eijεj)/εi/ε))]

with (LQ)i 1. A value of LQ = 1, suggests that the industry in the region in question is self-sufficient in the ith industry's production. If on the other hand the location quotien is less than one, the regional industry is import - oriented. Finally, if the $LQ>1$, the regional industry is considered to be export - oriented.

8. The economic growth performance of each industry in the region is evaluated on the basis of the growth components, as specified by the SS - M [Equation (1)].

9. Statistical figures indicate that in 1978 the average firm size ranged from 2.22 employees ta Grevena to 6.34 in Salonica. These figures compare to 5.21 and 4.71 employees at the national average and the average of the north, respectively.

10. For example, Table 3 indicates that the percentage of employment in the industries with $LQ>1$ in 1963 ranged from 57.9 %) in Salonica to 79.7 % in Kilkis. On the other hand, in 1978 industries with $LQ>1$ ranged between 54.8 % in Kilkis to 89.6 % in Kastoria.

TABLE 3

Industrial regional Characteristics

No.	REGIONS	Specialization Coefficients (S_C)		% of Employment in Industries with L.Q > 1		No. of Industries with Positive Net Relative Change		
		1963	1978	1963	1978	1963-1969	1969-1973	1973-1978
1.	Arta	0.32[0.29]	0.42[0.39]	71.0[78.9]	68.3[74.0]	10[9]	8[10]	8[6]
2.	Thesprotia	0.37[0.34]	0.33[0.31]	62.1[74.8]	77.9[78.0]	8[7]	6[8]	6[6]
3.	Ioannina	0.25[0.23]	0.40[0.38]	77.7[74.3]	80.3[81.7]	8[7]	8[9]	6[5]
4.	Preveza	0.25[0.25]	0.31[0.30]	65.6[59.9]	70.2[72.1]	12[8]	3[3]	10[7]
5.	Grevena	....[....]	0 33[0.28]	....[....]	78.7[74.4]	..[.]	5[7]	8[7]
6.	Drama	0.34[0.31]	0.36[0.32]	67.0[67.1]	82.9[44.2]	6[5]	5[6]	13[13]
7.	Imathia	0.33[0.31]	0.47[0.43]	67.1[67.1]	77.5[77.6]	11[10]	9[9]	10[9]
8.	Salonica	0.12[0.12]	0.14[0.16]	57 9[72.8]	57.3[78.4]	17[16]	8[9]	12[7]
9.	Kavala	0.38[0.31]	0.30[0.24]	63.8[58.4]	72.1[65.6]	7[5]	3[4]	8[6]
10.	Kastoria	0.76[0.74]	0.87[0.83]	78.5[78.5]	89 6[89.6]	9[8]	4[5]	6[5]
11.	Kilkis	0.23[0.22]	0.30[0.28]	79.7[79.7]	54,8[65.9]	4[2]	5[8]	12[12]
12.	Kozani	0.24[0.21]	0.41[0.40]	73.1[64.8]	58,8[60.7]	8[9]	5[7]	6[11]
13.	Pella	0.20[0.19]	0.37[0.32]	77.0[68.8]	69.2[67.7]	9[7]	7[5]	15[5]
14.	Pieria	0.25[0.19]	0.29[0.22]	68.4[77.8]	73.2[79.6]	9[8]	7[9]	10[6]
15.	Serres	0.22[0.19]	0.31[0.27]	74.4[83.0]	61.4[63.3]	6[4]	6[7]	15[13]
16.	Florina	0.27[0.24]	0.40[0.37]	80.4[81.0]	79.7[69.1]	5[4]	8[9]	6[4]
17.	Chalkidiki	0.36[0.33]	0.30[0.28]	86.6[86.6]	62.5[69.0]	9[7]	5[5]	11[11]
18.	Xanthi	0.31[0.28]	0,35[0.27]	78,5[49.3]	75.2[44.4]	9[4]	4[4]	17[12]
19.	Evros	0.33[0.23]	0.30[0.24]	67.9[78.1]	81.8[69.3]	5[7]	4[5]	13[15]
20.	Rodopi	0.25[0.25]	0.26[0.22]	72.4[75.5]	75.2[86.6]	7[6]	4[4]	11[9]

Note: The numbers in the brackets reflect the comparison of the sampled regions to the northern average.

(RS-C<0) was in most cases strong enough to outweigh the positive structural effect.

Other things being equal, the industrial regional characteristics [Table 3] and regional growth patterns of the northern part of Greece [Tables 1 and 2] clearly suggest that : (1) the disproportional growth of the geographical departments of the north, measured relative to the national and northern averages, to a great extent reflect the lack of pre - conditions (sizeable local markets, natural resources, infrastructure, etc.) necessary for an equitable regional growth performance ; and (2) the «small-size» and «inefficient - type» of operations in the north combined with the absence of locational advantages, perpetuates the regional disparity gap. Essentially, this implies that government action in various forms and on a regional (industrial) differentiating basis is required for a more equitable growth performance among the regions of the country. Some guidelines to this direction are discussed in the following section.

5.2. Regional Policy Analysis

Along with the shift components of employment, Boudeville's «regional - classification - type» is used to evaluate the differential growth performance in the sampled regions. The Boudeville method involves a classification of regions according to their performance in respect to composition (IM-C) and differential (RS-C) effects. Boudeville proposed an eight-fold classification of regional types[11]. Regional types 1-4 relate to regions that are growing faster than the average, whereas, regional types 5-8 relate to slow growing or declining regions. The classification of regions on the basis of Boudeville's method is reported in Table 4. In the 1963-1969 time period nine regions had a rate of growth exceeding the national average (regional types 1-4). The number decline to seven in the 1969-1973 period and increased to fifteen regions in the 1973- 1978 time period. When compared to the northern average, four regions in the 1963 -1969 period, nine in the 1969-1973 period and ten in the 1973-1978 period, fell into the 1-4 category. It should be noted that with the exception of two cases only, the regional - classification type changed between the periods considered. This among other things could be explained by the unstable performance of the regional growth components upon which the regional classification-types is based.

11 For the criteria used for this classification see Note, Table 4 ; Boudeville [1966] ; and Andrikopoulos [1978 and 1980].

TABLE 4

		REGIONS	BOUDEVILLE'S REGIONAL CLASSIFICATION-TYPE: North Relative to Nation 1963-69	North Relative to Nation 1969-73	North Relative to Nation 1973-78	Northern Regions Relative to North's Average 1963-69	Northern Regions Relative to North's Average 1969-73	Northern Regions Relative to North's Average 1973-78
A.		EPIRUS	4	4	5	7	2	8
	1.	Arta	4	4	8	2	1	8
	2.	Thesprotia	8	4	7	7	2	8
	3.	Ioannina	8	4	6	7	2	7
	4.	Preveza	8	8	4	7	6	4
B.		MACEDONIA	4	7	2	1	1	6
	5.	Grevena	2	8	4	2	6	8
	6.	Drama	8	8	4	8	8	4
	7.	Imathia	4	4	4	8	1	7
	8.	Salonica	4	8	2	1	4	6
	9.	Kavala	7	8	2	8	8	2
	10.	Kastoria	4	2	1	2	1	6
	11.	Kilkis	8	5	4	8	1	2
	12.	Kozani	2	6	6	5	8	6
	13.	Pella	4	4	4	7	1	4
	14.	Pieria	4	8	4	7	8	4
	15.	Serres	8	8	4	7	8	4
	16.	Florina	8	4	8	7	4	8
	17.	Chalkidiki	7	8	4	7	6	4
C.		THRACE	8	8	4	8	8	4
	18.	Xanthi	8	8	4	7	8	4
	19.	Evros	5	5	4	7	5	4
	20.	Rodopi	4	8	4	5	8	5

N o t e : The eight-fold classification suggested by Boudeville is : Regional Type 1: IM—C)0, RS—C>0, IM—C;>RS—C; Regional Type 2 : IM—C>0, RS—C>0, RS—C>IM—C; Regional Type 3: IM—C>0, RS—C>IM—C; Regional Type 4: IM—C<0, RS— **C>IM** -C; Regional Type 5 : IM—C<0, RS—C>0, IM—C>RS—C; Regional Type 6 : IM—C>0, RS-C<0; RS—C>IM— C; Regional Type 7 : IM—C<0, RS—C<0, RS —C<IM— C; and Regional Type 8 : IM—C<0, RS— C<0, RS—C> IM—C. The regional classification-type in the table were calcula ted from Tables 1 and *2,* above.

The Boudeville regional-classification-type can provide some useful guide, lines related to «regional - differentiating» economic policies designed to reduce regional economic disparities. Since in the present context, the differential growth performance of the regions is attributed either to the area's possession of fast (slow) growing industries at the national level (IM-C>0) or to the area's comparative advantages and consequent attractiveness to economic activities (RS-C>0), the Boudeville regional-classification-type : (1) enables the ordering of regions on a «priority» basis (ascending/descending) in accordance to need of economic assistance ; and more importantly (2) provides valuable information related to type and direction of economic policies required to alleviate regional disparities. Specifically, if a region' s growth deficiency is attributed to the structural component (IM-C<0), the focus of regional policy should be on the distribution of industrial capital. On the other hand, deficiencies attributed to differential growth(RS-C<0) call for policies aimed at infrastructure improvement in certain regions or the injection of growth industries in other regions. In either case, the purpose of regional policy is to increase the area's attractiveuness to industrial location[12]. The injection of fast growth industries into declining regions requires spatial diversity in employment structure over time and the ability to predict the change and direction of this structure. Alternatively, improvement of the region's comparative position requires the identification of the sectors sharing a regional comparative advantage and the causes responsible for the advantage. Together, the Boudeville classification and the SS - M provide the basis for a policy framework of this nature.

6. SUMMARIES AND CONCLUSIONS

The basic purpose of this paper was to : (1) provide a descriptive analysis of the growth patterns of manufacturing employment of the northern regions of Greece ; (2) identify, using the SS - M as a tool, the causes (i.e., industrial sructure and regional comparative advantage) of the observed regional disparities, relative to both the national and northern averages ; and (3) on the basis of the findings propose guidelines related to future regional development policies.

Depending on both the nature of the individual geographical regions of the north (i.e., fast vs slow growth regions) and the specific characteristics of regional industries {i.e., highly localized vs diversified industries ; fast growing vs slow

12. For a further discussion related to these issues, see also Buck [1970], Stilwell [1969], Hellman [1976] and Chalmers and Beckhelm [Г1976].

growing or declining industries), two sets of policies are recommended. Firstly, development policies directed at the region's industrial structure. Specifically, policies designed to modify the industrial structure of the region which will produce income changes. Through their impact on demand, these changes will generate further modifications in the regions industrial structure. Secondly, development policies aimed at the overall improvement in regional infrastructure. The emphasis of this group of policies is on locational advantages designed to attract industries to the region. Development policies of this nature should be implemented on a regional (industrial) differentiating basis and should complement national policy objectives.

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REFERENCES

Andrikopoulos, A.A. [1977]. «Regional Growth Differential of Manufacturing Employment : The Case of the Province of Ontario, Canada», The Review of Regional Studies,7, No. 3:45-61.

Andrikopoulos, A.A. [1978]. «Industrial Structure and Regional Change : The Case of the Greek Economy, 1963-1969», The Greek Review of Social Studies, 32: 106-116.

Andrikopoulos, A.A. [1980]. «A Synthesis of the Production Function and the Shift - Share Model, A New Regional Modelling Approach», Regional Science and Urban Economics, 10 :539-: 560.

Beaud, M. [1966]. «Analyse Régionale-Structurelle et Planification Régionale,» Revue Economique, XVII-2: 254-287.

Boudeville, J.R. [1966]. «Problems of Regional Economic Planning,» U.P., 77-80.

Brown, H.J. [1969], «Shift and Share Projections of Regional Economic Growth : An Empirical Test,» Journal of Regional Science, 9:1-8.

Buck, T.W. [1970]. «Shift and Share Analysis - A Guide to Regional Policy», Regional Studies,4:445-450.

Buck, T.W. and Atkins, M [1983]. «Regional Policies in Retrospect : An Application of Analysis of Variance», Regional Studies, 17-3: 181- 189.

Chalmers, J.A. and T.L. Beckhelm [1976]. «Shift and Share and the Theory of Industrial Location», Regional Studies, 10 : 15 - 23.

Estban - Marguillas, J.M. [1972]. «A Reinterpretation of Shift - Share Analysis», Regional and UrbanEconomics, 2 :577 - 581.

Edwards, T.A. [1976]. «Industrial Structure and Regional- Change : A Shift -Share Analysis of the British Columbia Economy, 1961 - 1970, «Regional Studies, 10 : 307 - 317.

Floyed, C.F. and Sirmans, CF. [1973]. «Shift and Share Projections Revisited,» Journal of Regional Science, 19. : 115- 120.

Floyed, C.F. and Sirmans, CF. [1975]. «The Stability of the Regional Share Components : Some Further Evidence», Annuals of Regional Science, 9: 72-82.

Helman D. A. [1976]. «Shift - Share Models as predictive Tools», Growth and Change, 7 : 3-8.

Houston, D. [1967]. «The Shift and Share Analysis of Regional Growth», Southern Economic Journal, 33 : 577-81.

Ireland, T. and Moomaw, R. [1981]. «The Competitive Effect in Shift Share Analysis : A Wil of the Wispc» The Review of Regional Studies, 11: 72-82.

James, F.J. and Hughes, J. [1973]. «A Test of Shift and Share Analysis as a Predictive Device», Journal of Regional Science, 13 : 233-41.

Klassen, L.H. and Paelinck, J.H.P. [1972]. «Asymmetry in Shift - and - Share Analysis», Regional and Urban Economics, 2 :256- 61.

Maddox, J.G. and Liebharsky, E.G. [1967]. The Advancing South, The Twentieth Century Fund (New York).

National Statistical Service of Greece, Manufacturing Censuses, 1963, 1969, 1973 and 1978 (Athens).

National Statistical Service of Greece, Population Census, 1981, (Athens).

Paris, J. D. [1970]. «Regional Instructural Analysis of Population Changes, «Regional Studies, 4:425 -443.

Randall, J.N. [1973]. «Shift- Share Analysis as a Guide to the Employment Performance of the West Central Scotland,» Scottish Journal of Political Economy, 20 : 1 - 26.

Sakanita N. [1973]. «An Axiomatic Approach to Shift- and - Share Analysis,» Regiona and Urban Economics, 3: 263 - 72.

Steed, G.P.E. [1967]. «Locational Changes: A Shift-Share Analysis of Northern Ireland's Manufacturing Mix, 1950-64,» Tijdschrift, Voor Econ.Soc. Geografie, Sept.- Oct. 265- 270.

Stilwell, F.J.B. [1969]. «Regional Growth and Structural Adaptation,» Urban Studies, 6:162-78.

Thirlwall, A.P. [1967]. «A Measure of the «Proper» Distribution of Industry», Oxford Economic Papers, 19 : 46 - 58.

Tihanyi, E. [1966]. An Approach to the Study of Regional Labor Absorption: The Case of Saskatchewan, 1941 - 61 (Saskatoon : The Canadian Center of Community Studies).

Whipple, R.T.M. [1966]. «Regional Differentials and Economic Planning», Australian Planning Inst. Journal, IV-4 : 180- 187.

Zimmerman, R. [1975]. «A Variant of the Shift and Share Projection Formulation», Journal of Regional Science, 15: 29-38.