the Greek regional problem: some analytic and policy perspectives

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I. introduction

Within the field of regional economic development and planning there exist a number of unresolved issues. Among these are a well-defined etiology for the emergence of unequal growth patterns within a given national space, a functional model for the interference of such unequal growth patterns with national developmental efforts, bases for making regional equalization and/or decentralization policy choices, and the nature of evaluative criteria for measuring the effectiveness of these choices.

The literature which treats these problems is fairly small and far from unanimous. For example, regional growth disparities are attributed to initial differences in factor endowments[1]—which viewpoint construes regional growth as the outcome of resource movements generated by earnings differentials; to the cumulative effect of external economies;[2] to the existence of economic «poles de croissance» (growth poles);[3] and to regional differences in production functions or in the demand for a region's exports.[4]

The policy recommendations of economic planners comprise two distinct and mutually exclusive schools of thought, one of which assumes an elastic factor supply and stresses «balanced» growth[5] with the other assuming an inelastic factor supply and favoring concentrated and sequential growth so that scalar and external economics can be maximized.[6] The latter school in particular admits that international and interregional growth inequalities are a necessary condition for continuous and sustained economic growth,[7] so that the presence of «growth poles» is indicative of the degree of economic maturity attained

1. This refers to the competitive or cumulative advantage of regions which supply the inputs that support «an extensive stream of nationally-wanted production». «See Harvey Perloff and Lowdon Wingo, «Natural Resource Endowment and Regional Economic Growth», in *Regional Development and Planning*, ed. by J. Friedman and W. Alonso (Cambridge: M.I.T. Press, 1964), pp. 224-225.

2. Gunnar Myrdal, *Economic Theory and Underdeveloped Regions* (London: Gerald Duinworthy and Co., Ltd., 1957).

3. F. Perroux, *Théories et Politique de l'Expansion Regionale* (Brussels, 1961).

4. G. H. Borts, «The Equalization of Returns and Regional Economic Growth», *American Economic Review* (June, 1960). See also, R. E. Baldwin, «Patterns of Development in Newly Settled Regions», *Manchester School of Economics and Social Studies*, XXIV (May, 1956).

5. Gunnar Myrdal, *Economic Theory and Underdeveloped Regions* (London: Gerald Duinworthy and Co., Ltd., 1957).

6. Hollis Chenery, «Competitive Advantages and Development Policy», *American Economic Review*, LI (March, 1961), 18-51. See also, Ragnar Nurkse, *Problems of Capital Formation in Underdeveloped Countries* (New York: Oxford University Press, 1953).

7. A. O. Hirschman, «Interregional and International Transmission of Economic Growth».

by various economic systems.[1] This implies that countries in the early phases of their economic development tend to exhibit keener regional growth disparities that may alter unfavorably the scheduling of profitable public investments and necessitate more infrastructural expenditures. Regional growth differentials within the more economically advanced countries are viewed as welfare problems stemming from the immobility of human resources and the autonomous changes in the metropolitan structure.[2] In either case, there are serious repercussions for any given resource allocation patterns.

The question of whether regionally imbalanced economic growth interferes with national developmental objectives is a difficult one unless it can be said that uneven growth leads to excessive urbanization rates (within a limited spatial context), to the formation of large and uneconomical cities, and to the generation of unwarranted social costs. A simple yard-stick for gauging the interference of overurbanization and regional imbalance with national economic development might be the dynamic change in the composition of the national investment budget. Available data suggest that economic growth rates diminish appreciably as the non-productive share (crime prevention, welfare payments, health expenditures, maintenance costs) of the total investment budget increases at the expense of the productive share (industrial development, land reclamation projects, water resource development, and the like). Lloyd Rodwin estimates that approximately 50 to 70 percent of the total investment budget of an average under-developed country is absorbed by social overhead.[3] Research is needed to test the hypothesis pointing to the direct relationship between overurbanization and relatively increasing infrastructural investments.

The choise between regional equalization policies (designed to redistribute populations and economic activities in space) and regional development policies (designed to raise incomes, employment levels, and productivities of lagging regions) has historically been made with a full understanding of neither the array of tools available for implementation nor the implications of their use. Many paradoxes have emerged as a result. For example, countries whose regional economies lack the dynamic potential for economic development have engaged in equalization policies—such as breaking up the preponderance of a single urban-industrial complex—thus obviously failing to grasp the substance of their problem. The reverse—that is, misapplication of regional development policies—has been executed as well in other countries.

The purpose of this paper is to demonstrate, using the case of Greece for the period between 1952-1965, that the formulation of policy decisions aiming at regional equalization can lead to undesirable results when programs fail to take into account the marginal productivities of both agricultural and industrial workers, and more importantly, the forces causing unwanted population movements as they exacerbate regional inequalities.

II. some aggregate measures of regional inequality

The Greek economy is essentially agricultural in nature with a relatively small and slow-growing industrial sector (see Table 1). In spite of the massive aid received by Greece under the auspices of the Marshall Plan between 1948 and 1955, the relative shares of the agricultural, industrial, and service sectors of the gross national income have been little affected. For example, although agriculture's share decreased from 34 percent in 1948 to 25 percent in 1955 and has continued at this level, the other major sectors—manufacturing and services—have remained roughly constant at approximately 16 and 46 percent respectively. The remarkable stability of these components of the economy indicates a lack of noticeable movement toward either industrialization or a more intensive use of the country's agricultural resources: there is a lack of resources such as iron ore, coal, and cheap electric power to sustain industrialization;and large scale agricultural development has been stymied by a constant drain of labor via both migration to the Athens region and emigration abroad.

The distribution of economic activities among the various regions is neither equal nor stable. In 1958, for example, Athens accounted for about 45.7 percent of the total number of industrial firms, 53.2 percent of total industrial employment, and 55.7 percent of total industrial output. In 1963 those figures were 50.4 percent, 54.8 percent, and 51.0 percent respectively. Moreover, of the 14 percent national increase in manufacturing employment between 1958 and 1963, Athens accounted for approximately 85 percent.

The disproportionate share claimed by Athens is pervasive throughout the Greek economy. In 1962, for example, Athens, with roughly 23 percent of the total population, accounted for approximately 41 per-

1. Myrdal has essentially expressed a similar view that implicitly accepts the inevitability, if not desirability, of unbalanced economic growth—his «backwash» effects. See *Economic Theory*.

2. The association of «North-South» dualism with degree of economic development is demonstrated in J. G. Williamson, «Regional Inequality and the Process of National Development: A Description of the Patterns», in *Regional Analysis*, ed. by L. Needleman (Baltimore: Penguin Books, 1968), pp. 99-158. See also, D. J. Plessas, *The Decentralization Aspect*, pp. 60-67.

3. Lloyd Rodwin, «Choosing Regions for Development», in *Public Policy*, ed. by Carl J. Friedrich and Seymour R.Harris (New York: 1963), p. 148.

TABLE 1. *Industrial Origin of Gross National Income at Factor Cost (In Millions of Dollars at Current Prices)*

	1948	1955	1961	1964
Agriculture, forestry and fishing	206.9	658.2	958.4	1,155.2
Mining and quarrying	2.9	19.5	37.0	44.0
Manufacturing	82.2	338.8	562.2	731.6
Electricity, gas and water works	4.6	21.6	52.5	77.5
Construction	20.7	98.6	229.9	328.3
Services	278.0	1,081.6	1,652.0	2,184.3
Gross domestic product at factor cost	595.3	2,218.3	3,492.0	4,520.9
Net income payments to factors of production due from the rest of the world	3.4	31.2	79.4	111.6
Gross National Income at factor cost	598.7	2,249.5	3,571.4	4,632.5

Source: Calculations based on Ministry of Coordination, «National Accounts of Greece», No. 16 (Athens: 1967), 49-50.

TABLE 2. *Per Capita Regional Incomes and per Capita Gross Regional Product, 1962*

Region	Per Capita Incomes (In US Dollars)[a]	Percentage of National Average for 1962	Per Capita Gross Regional Product (In US Dollars)[b]	Percentage of National Average for 1962
Greater Athens Region	812	223	627	153.6
Rest of Central Greece	273	74	307	76.6
Macedonia	271	73	371	92.6
Peloponnesos	217	59	355	80.6
Thrace	236	64	287	71.5
Thessaly	234	63	297	74.1
Aegean Islands	216	59	274	68.4
Crete	217	59	265	66.0
Epirus	145	39	227	56.9
Ionian Islands	141	38	231	57.7
Total Greece	367	100	400	100.0

a Milistry of Coordination, Regional Development Service.
b Centre of Planning and Economic Research, «Draft of the Five-Year Economic Development Plan for Greece: 1966-1970» (Athens: 1965).

cent of the national domestic product, while its share in other activities was the following:

Public Utilities	74%
Transport-Communications	47%
Trade	58%
Credit, Insurance, etc.	77%
Public Administration	51%
Health	53%
Other Services	51%[1]

The regional distribution of per capita incomes and per capita gross product,[2] perhaps the most revealing indices of regional inequality, also indicates the preponderance of the Athens region. Table 2 displays these data for 1962.

Table 3 shows the regional employment structure by economic sector. It is evident that, outside the Greater Athens Region (GAR), agriculture occupies the largest part of all the regions' labor forces. This is consistent with the absence of any massive resource concentrations that would allow some regions to specialize in non-agricultural activities. Also shown in Table 3 is the sectoral make-up of regional gross products, which is as skewed as sectoral employment.

1. Center of Planning and Economic Research, *Draft of the Five-Year Economic Development Plan for Greece, 1966-1970* (Athens: 1965), p. 146.

2. This indicator is probably more representative of the productive capacities of the regions since income differences are not adjusted for variations in the regional price structures. For example, a comparison of incomes between, say Athens and Thessaly, should yield somewhat smaller differences for the higher prices prevailing in this region.

Overlaying the regional employment data onto the sectoral distribution of regional gross products, one can note that relatively more labor is devoted to agriculture than is justified on the basis of agriculture's contribution to the gross product. This contrast by no means constitutes a yardstick for measuring relative labor efficiency by sector and region; it also tends to lead to the false conclusion, in the absence of data on marginal labor productivities, that, in the long run, migration of agricultural workers to Athens, as well as mobility of labor from agriculture to industry or services, raises per capita incomes. We will argue below that perhaps the reverse is more likely to be the case.

The distribution of regional infrastructural capital in Greece is equally lopsided. Although it is extremely difficult to inventory social capital, a crude but probably indicative picture can be drawn. Health facilities, including physicians, are overwhelmingly concentrated in the GAR, with no other region even approaching the national average. Education facilities exhibit a similar pattern. For example, in 1961 the GAR had about 15 percent of the country's school-age population while in that same year it contained some 33 percent of the country's high shool students; this can plausibly be explained by the fact that migrants receive their primary education in their villages before migrating to Athens, so that the metropolitan demand for primary education is relatively small. Also in 1961, 51 percent of all private elementary schools were located in Athens; this represented 46 percent of the total number of schools.

Vocational training facilities are also heavily con-

TABLE 3. *Employment Composition and Distribution of Gross Product by Economic Sector and Region, 1961-62 (In Percentage)*

Region	Agriculture		Manufacturing		Services	
	Percentage Employment	Percentage of Gross Product	Percentage Employment	Percentage of Gross Product	Percentage Employment	Percentage of Gross Product
Greater Athens Region	5.6	3.0	40.8	36.6	53.6	60.4
Rest of Central Greece	71.1	49.0	13.4	19.7	15.5	31.1
Macedonia	66.3	42.7	16.7	23.1	17.0	34.2
Peloponnesos	70.0	49.1	12.7	20.0	17.3	30.9
Thrace	80.0	59.6	8.7	12.8	10.5	27.6
Thessaly	67.8	48.5	15.5	19.1	16.7	32.4
Aegean Islands	55.7	31.4	19.1	23.1	25.2	45.5
Crete	72.0	41.4	11.6	18.4	16.4	40.2
Epirus	71.9	38.9	12.9	22.0	15.2	39.1
Ionian Islands	70.0	32.0	11.9	21.6	18.1	46.4
Total Greece	55.8	28.2	19.8	27.1	24.4	44.7

Source: Ministry of Coordination, Center of Planning and Economic Research.

centrated in Athens: in 1961, about 50 percent of all vocational schools and 53 percent of all vocational students were located in the GAR. The installment and consumption of electric power are additional indices of considerable importance: in 1961 the GAR consumed 65 percent of the country's total power and 62 percent of its total industrial power. Domestic power consumption at the same time was 2,900 kilowatts per 10,000 population—3.7 times the national average with, again, no other region approaching the national average.

The intensity of the Greek regional problem is clearly reflected in the relative population of the Greater Athens Region vis-à-vis the rest of the country. During the decade 1951-61, total population increased from 7,630,000 to 8,380,000—an increase of 9.8 percent—while the GAR's population increased from 1,378,000 to 1,852,000, an increase of 34.4 percent. More than 70 percent of the GAR's net population gain consisted of migration from the other nine regions of the country. Moreover, the GAR accounted for 68 percent of Greece's total urban population increase during the same decade, while Salonika, the second largest city, accounted for only 12 percent.

The GAR is the only collector of domestic migrants, adding to its population for the period 1960-65 more people through migration than the total natural population growth of Greece. The maritime regions plus Thrace, Epirus, and Peloponnesos have registered substantial population losses; of these, Thrace and the Aegean Islands are the only ones losing more population in foreign migration than to the GAR. The comparison of net migration per annum with the annual natural population increase for each individual region shows that six regions, constituting roughly 40 percent of the country's population, are actually being depopulated. Peloponnesos and the maritime regions in particular have had severe population losses dating from 1956.

The allocation of state investment funds is an effective means of leveling off regional disparities inasmuch as Greece is consciously pursuing a policy of decentralization. There are two types of public investment: productive and social or infrastructure investment. From an economic standpoint, the undertaking of productive investments is less useful for regional equalization objectives than is that of infrastructural investment, because the feasibility of productive investments is defined in terms that are irrelevant to the degree and magnitude of regional disparities. It is frequently the case that more developed regions offer more investment opportunities and higher benefit-cost ratios per dollar than do less developed regions.[1] In contrast, the provision of infrastructural capital is well-suited to the pursuit of regional equalization objectives since it is not subject to hard economic calculations.[2]

1. Mr. Rahman finds that it would pay, under certain conditions, to concentrate investment in less developed regions, that have a higher rate of saving than other regions. He states that «in the presence of differential regional rates of saving, the rate of growth of total national income is not necessarily maximized by concentrating investment in the more productive region throughout the planning period». He subsequently shows in a two-region model when to shift investments from one region to another. See M. A. Rahman, «Regional Allocation of Investment», in *Regional Development and Planning*, ed. by J. Friedman and W. Alonso (Cambridge: M.I.T. Press, 1964), p. 655. Note that in the above context, the allocation of (productive) investment may have an equalizing effect on the economy which is largely incidental.

2. In those countries where urbanization rates exceed growth rates, the large urban agglomerations absorb most of the funds earmarked for the provision of infrastructure, thus reducing the planning authority's capacity to embark upon an effective policy of regional equalization. This by itself has become a powerful argument for urban decentralization.

TABLE 4. *Percentage Distributions of Regional Investments as a Percentage of Total State Investment, by Category, 1954-1965*

Region	Total	Agric.	Mfg.	Public Utilities	Transp.	Tourism.	Educat.	Health and Welfare	Public Admin.	Housing	Misc.
Rest of Central Greece[b]	25.7	21.1	8.5	25.7	35.6	40.4	36.1	42.8	63.2	36.8	17.6
Peloponnesos	12.9	12.0	2.5	7.8	17.0	14.6	7.5	7.5	2.2	20.8	16.9
Ionian Islands	1.7	0.4	0.0	17.0	1.6	5.1	1.0	3.2	3.0	0.7	4.1
Epirus	6.0	6.8	0.2	3.0	7.6	6.0	1.9	2.5	3.8	5.0	8.1
Thessaly	9.8	6.1	17.1	3.6	12.8	5.8	2.8	10.2	4.9	3.3	7.2
Macedonia	31.2	40.1	70.8	28.5	14.6	12.4	44.1	24.7	16.9	22.6	20.0
Thrace	5.1	12.1	0.1	5.7	3.7	1.5	1.4	2.4	2.4	2.1	3.5
Aegean Islands	3.5	0.7	0.2	5.7	3.1	9.1	1.1	2.2	2.2	3.5	10.6
Crete	4.1	0.7	0.6	16.6	4.0	5.1	6.6	1.4	1.4	5.2	12.0
Total Greece	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a Only 70 per cent of the total State Investment Budget can be regionally classified.
b This region includes the Greater Athens Region.

Source: Ministry of Coordination, «The Regional Distribution of Investments in the Past» (in Greek) (unpublished paper, Athens, 1968).

Table 4 shows the percentage distribution of regional investments in Greece by category and as a percentage of the total state allocation for a given category. The dollars involved for the 11-year period shown are about $ 1.33 billion although the entire State Investment Budget was about $ 1.85 billion for the same period—about $ 0.52 billion cannot be regionally disaggregated. The table shows that the GAR's share of the State Investment Budget, although combined with that for the Rest of Central Greece region, is the second largest and not as much larger as one would expect than that of the Peloponnesos. The «non-productive» investments, such as health and education, seem to be large for the GAR-RCG but are essentially small with respect to this region's total budget. This is so because the budgets of the other regions are mostly absorbed by agricultural manufacturing and transport activities, so that relatively little is left for social overhead. Therefore, the percentage of the GAR's budget devoted to infrastructure is not higher than those of the other regions and, if adjustments are made to take into account different population sizes, it may be estimated that the GAR has roughly the third or fourth highest per-capita investment for infrastructural purposes.

III. an assessment of Greek decentralization efforts

The Greek government undertook measures for the spatial dispersion of industry under the auspices of a series of legislative acts that began in 1952 and apparently ended in 1967. These measures consisted entirely of a system of indirect subsidies to those industries willing to «decentralize» outside of the Greater Athens Region, and took the form of tax credits, accelerated depreciation, the development of tax-free reserves, and tax reductions on net profits intended for reinvestment.

Tax credits were of two varieties: those designed to lower the production costs of industries choosing a «provincial» location, and those that developed incentives for the re-investment of tax savings in an attempt to increase total investment outside the GAR. The former variety included sales tax reductions, tariff exoneration schemes for imported capital goods, freedom from local taxes, reductions in employer contributions to social security, and the elimination of the 6% tax on wages and salaries. Of these tax incentives, the last three were made available to all industries willing to locate outside the GAR, with the full benefits accruable regardless of distance from the GAR's border; the first and second offered full benefits at a maximum distance of 60 miles from the border. This proved to be one of the major weaknesses of the decentralization effort, since an industry could realize a 20% reduction in sales taxes right on the GAR border, 30% for moving an additional 30 miles, and the maximum 40% anywhere else in the country; the tariff reduction scheme offered complete tariff exoneration to any industry moving 30 miles from the GAR, and a 50% reduction within the 30-mile boundary.

The second type of tax incentives included accelerated depreciation schemes, the development of tax-free reserves, and tax benefits on net profits intended for reinvestment. These were equally unrealistic in a geographic sence since they offered no substantive benefits to truly provincial industry. For example, while depreciation rates for capital equipment of «provincial» industries were twice as high as those of industries located in the GAR, again the term

«provincial» was applied to all locations other than those directly within the GAR.

In retrospect, the main weakness of the decentralization program was its failure to place the tax incentives on a spatially graduated basis. Since in most cases the full advantages of the tax credits were realizable on the fringe of the GAR, and in some cases at a maximum distance of 30 miles from it, a «provincial» location could in theory be attained at 20 to 25 miles from central Athens and many firms «decentralized» accordingly. Because the GAR is constantly expanding and spilling over into the adjacent department of Boeotia, it is inevitable that a substantial portion of the «decentralized» industry will be reabsorbed by the GAR.

It is difficult to develop accurate measures to evaluate the effectiveness of the decentralization program given both its loose objectives and the scarcity of relevant data. Some estimates developed to measure the regional distribution of industrial employment indicate that between 1958 and 1963 the GAR's share rose from 41.4% to 46.8%. Three-fourths of this increase consisted of the entire national percentage growth for this period while the rest came at the expense of the other regions. In other words, not only did the GAR's increase account for the national increase in industrial employment but the GAR diverted workers from the rest of the country as well. Between 1961 and 1966 the GAR's share of the country's industrial firms rose from 85% to 86%, while of the 10% of the GAR's firms that responded to Decree 4002/1959, offering tax reductions on net profits to industries moving outside the GAR, nearly all relocated on its fringe.

Of greater importance is the program's effect on the enhancement of provincial investment. The difficulty in measuring this effect lies in the fact that total investment levels in those industries most likely to respond to the tax incentives exhibit both a high degree of instability and a long-run tendency to decrease. Research completed by the Center of Planning and Economic Research in Athens suggests that the development of private investments in industry over the last fifteen years has not indicated any positive response to the tax incentives.[1] A satisfactory way to measure the program's overall effectiveness in stimulating provincial investment is to identify the relationship between autonomous investment and investment induced by the system of tax credits. This can be formalized as follows for any selected period of time in which the program is operating:

$$\frac{Gtl}{I_t} \leqslant \frac{I_i}{I_a}$$

where

Gtl = government tax losses or other costs arising from the program
I_t = total investment in the areas specified by the program
I_i = investment induced by tax credits
I_a = autonomous investment

The program's effectiveness is maximized if for every positive change in total investment the value of the right side of the above expression is greater than that of the left side. A qualification of the above expression is that, since the program should be designed in such a way as to assure that a given loss in government tax revenue brings forth a positive change in total investment, the left side must be less than unity, reflecting the fact that total investment is a composite of induced and autonomous investment.

Some estimates made by the Center of Planning and Economic Research indicate that over the course of the decentralization program the total loss of government revenue attributable to the program was between 0.3 and 0.4 of total investments, and that the ratio of induced to autonomous investment was at least 0.6. The difference between the two sides of the above expression was estimated to be at a maximum. Yet the decentralization program failed both to decongest Athens and to spread investments in lagging regions. Even if induced investment was correctly estimated to equal 60% of autonomous investment, it was so only by definition since it took place at a maximum of 40 miles from the central city. Considering that the cost of the program in terms of revenue losses for the years 1959-1966 was $ 162.5 million (the total amount for 1954-1967 is not known), it amounted to a costly subsidy to industry. This large allocation might truly have narrowed interregional differences had it been used by the government to stimulate provincial industry or promote projects of a broader regional significance.

IV. an alternative analytic view

The policy followed by the Greek government for roughly fifteen years was based on the assumptions that the concentration of industry in the GAR prevented the rest of the economy from realizing its full potential, and that given the proper incentives the locational advantages of the GAR could be lessened so as to promote industrial growth elsewhere. Greek planners failed to assess properly both the full range of the GAR's locational advantages and the dynamics of population movements and consequently ac-

1. Center of Planning and Economic Research, *The Effectiveness of the Tax Incentives in Greece and Some Proposals for Their Improvement* (in Greek, Athens: 1967). This conclusion is based on the fact that other variables, independent of the tax incentives, explain all of the fluctuations in private investment levels.

tually aggravated the country's regional imbalance. An attempt is made below to construct a somewhat different, and hopefully more accurate, analytic basis for dealing with the problem.

In order to clarify the implications of the imbalance and general systemic behavior of the Greek regional economy, two parameters will be briefly analyzed: these are domestic migration and income levels. A. *Domestic Migration.* Domestic or interregional migration can be defined—in accordance with classical economic theory—as the propensity of individuals to migrate on the basis of real or assumed job opportunities, income levels, and living conditions prevailing in other regions. Table 5 lists the data for the ten Greek regions from which the following regression equation is obtained. The application of the above definition of domestic migration to the data yields a correlation coefficient of 0.9857.

$$(1) \quad DM = -1.80 + 0.20\,(w - \bar{w}) + 0.086\Delta E$$
$$[1961] \quad [1951\text{-}61]$$

Domestic migration (DM) has been expressed as a percentage of the 1960 regional population while the first explanatory variable $(w - \bar{w})$ denotes the difference between regional and national per capita incomes in 1961. The second variable (ΔE) denotes the percentage change in the demand for labor in each region during the period 1951 to 1961.

The partial correlation coefficients between (DM)

TABLE 5. *Input Data for Equations Fitted for Greece*

	% of Natural Population Increase	Domestic Migration in 1960-1965 as % of 1960 Population	% Increase in Employment	Difference between Regional and National Per Capita Income in Absolute Terms	Difference between Regional and National Per Capita Income in Relative Terms
	1951-61		1951-1961	1961	1961
	(Δ^nTP)	(DM)	(ΔE)	$(w - \bar{w})$	$(w - 100)$
GAR	2.94	9.96	35.8	448	123.0
RCG	0.67	—2.20	12.0	—91	—25.0
THE	1.04	—2.10	26.6	—130	—35.7
PEL	—0.29	—5.60	7.6	—147	—40.4
MAC	1.07	—0.27	24.9	—93	—25.6
EPI	—0.64	—5.80	23.3	—219	—60.2
THR	0.56	—0.17	14.0	—128	—35.3
ION. IS	—0.72	—6.85	—1.7	—223	—61.3
AG IS.	—1.02	—5.40	—4.5	—148	—40.7
CRE	0.46	—3.80	22.5	—147	—40.4

Source: Data taken and estimated from the 1951 and 1961 Population Censuses and the Statistical Yearbooks for the years 1960 through 1967.

TABLE 6. *Actual and Estimated Domestic Migration in Greece: 1960-1965*

Region	Actual Migration	Estimated Migration	Influence of Income Differences from National Average $(w - \bar{w})$	Influence of Growth in Demand for Labor (ΔE)
GAR	9.96	10.44	9.18	3.06
RCG	—2.20	—2.63	—1.86	1.03
THE	—2.10	—2.19	—2.66	2.27
PEL	—5.60	—4.16	—3.01	0.65
MAC	—0.27	—1.58	—1.91	2.13
EPI	—5.80	—4.30	—4.49	1.99
THR	—0.17	—3.22	—2.62	1.20
ION.IS.	—6.85	—6.52	—4.57	—0.15
AG IS.	—5.40	—5.21	—3.03	—0.38
CRE	—3.80	—2.89	—3.01	1.92

and $(w - \bar{w})$ and between (DM) and (ΔE) are both highly significant, with values of 0.9672 and 0.7133 respectively.[1]

Table 6 assists in the development of an understanding of the quantitative effect on domestic migration on the two explanatory variables. Interestingly, the income-generated pull of the GAR on migrants was three times greater than the pull linked to the growth of job opportunities. The creation of job opportunities—virtually the entire thrust of the Greek decentralization program—by itself had relatively little effect on migration. For example, the demand for labor in Macedonia increased by 150,000 jobs between 1951 and 1961, while in the GAR it rose by 180,000 jobs; but because of the GAR's more favorable income image, the impact on migration was much greater than the small differential in the demand for labor would suggest. Other regions with relatively large increases in the demand for labor, such as Crete and Thessaly, were likewise unable to check the migration to the GAR.

It appears from these observations that, while regional income differences are generally recognized as the most significant factors in the causality of migration, in the case of Greece they seem virtually to be the *only* factors. The GAR's income image essentially dictates interregional population movements, which in turn generate the regional inequalities discussed earlier. The significance of this conclusion becomes critical to economic planners when the etiology of income differences is taken into account. B. *Income Levels.* In order to examine the causes of income differences among regions, we have employed

1. With a total of ten observations the critical value for the correlation coefficients at the 0.95 confidence limit is 0.6319.

a model developed by Klaassen[1] which, simply stated, holds that income differences are linked to the demand and supply of labor in various regional settings. Its basic assumptions are: (1) migration to a region is positively related to the differences between the region's wage level and the average national wage level; (2) the wage level prevailing in various regions is the predominant factor in industrial locational preferences (a collective variable z represents all other exogenous considerations accounting for these preferences); (3) there is a constant proportion of the population representing the demand for labor by non-basic industries; and (4) in any particular region, conditions of full employment prevail. Four equations expressing these assumptions, along with three identities, constitute the seven structural equations of the model. From these equations two «reduced» equations are derived, one for the total regional labor force and the other for the regional differences in wage levels. Although it is not necessary to reproduce here Klaassen's model, his application of it to the nine Belgian provinces merits attention. Klaassen used the direct least squares method to fit his Belgian data and obtained a value for the coefficient of multiple correlation of 0.85 from his reduced form equation for wage differences. This equation is:

$$(2)\quad (w - 100) = -4.3 - \underset{[1950\text{-}59]}{2.75\Delta^n TP} + \underset{[1950\text{-}59]}{2.27\Delta E\ (0.5)}$$

[labor supply] [labor demand]

The endogenous variable (w - 100) denotes the difference between provincial and national per capita incomes. The first exogenous variable (Δ^nTP) represents the national population growth while the second [ΔE(0.5)] stands for the one-half of one percent increase in the employment of basic industries.

When the Greek data were fitted to Klaassen's model a coefficient of multiple correlation of 0.88 was obtained together with the following equation:

$$(3)\quad (w - 100) = 23.20 + \underset{[1951\text{-}61]}{50.71\Delta^n TP} - \underset{[1951\text{-}61]}{2.46\Delta E(0.5)}$$

The partial correlation coefficient between (w - 100) and Δ^nTP is statistically significant with a value of 0.85, while that between (w - 100) and ΔE (0.5), with a value of 0.57, is not statistically significant.

Klaassen's reduced-form equation was subsequently modified so that the differences between regional and national per-capita incomes—expressed now in real terms—were regressed against the percentage increase in total regional population (supply of labor) and against the percentage increase in the demand for labor by both basic and service industries. This equation is:

$$(4)\quad (w - \bar{w}) = -23.52 + \underset{[1951\text{-}61]}{56.80\Delta^n TP} - \underset{[1951\text{-}61]}{14.12\Delta E(0.5)}$$

The multiple correlation coefficient is again statistically significant with a value of 0.8538.

The contrast between the Belgian and the Greek cases illustrates the point that the laws of the demand and the supply of labor have greater applicability to Belgium than to Greece. Conceivably, the limitations imposed on the model by assumptions (2) and (4), as well as the fact that Greece has a single urban-industrial complex rather than several, may exaggerate the real differences between the two countries. However, these considerations cannot explain away the contrast since the equations could be constructed to suit them quite independently of the model mechanism. In fact the modifications imposed on equation (4) produce a better analytic framework by taking into fuller account Greece's regional peculiarities. The fact that in the Greek case the influence of population growth (supply of labor) on incomes is positive rather than negative simply reinforces the magnitude of the problem.

V. policy perspectives

Prolonged migration, as a function of the GAR's income image, coupled with relatively low investments in mechanizing agriculture (which simply means that the loss of agricultural workers to the national economy and their conversion into industrial and service workers takes place without compensatory investments in agricultural mechanization), is rapidly reducing regional incomes below their real potential. In the absence of compensatory investments, the loss of even a few agricultural workers has a disproportionate effect on incomes since the lost marginal productivity of these workers is of greater magnitude than the added agricultural capital component. The sensitivity of provincial regions to income-linked population losses amply demonstrates this point. Moreover, as discussed earlier, «decentralized» industry has neither produced the jobs nor sufficiently redirected the pattern of private investments to really compensate these regions for the decreases in agricultural productivity. If anything, «decentralized» industry has absorbed labor from agriculture and thus affected regional growth potential even more severely.

It seems apparent that as long as the GAR conti-

1. Klaassen, L. H., *Area Economic and Social Development: Guidelines for Progress.* Paris: OECD, 1965.

nues to project a higher income image to the other regions there is little or no value in industrial decentralization schemes. An alternative policy, based on the dual strategies of increased investment in provincial agriculture and of investments calculated to raise the cultural level of the provincial regions, promises greater pay-off in the long run. Since migration is triggered largely by expectations of the superior life style and its concomitant social and cultural opportunities promised by the GAR via its income picture, policies which focus on reducing these differentials are obviously preferable.

The possibility of exploring sociological solutions to problems defined in strict economic terms should open new and perhaps intriguing vistas to economic planners. Such strategies as state subsidies to regional theater groups and cultural centers, the development of day-care centers, and other related activities may boost the quality of life in cities other than Athens to the point where they too may begin acting as collectors of migrants. It is quite probable that such measures may have a better chance than the costly industrial subsidies of intervening effectively between the migrant's conception of living patterns in the GAR and the reality of his own environment.