CENTER OF ECONOMIC RESEARCH

LECTURE SERIES

4.

THE LOCATION PATTERN OF GREEK INDUSTRY

By

GEORGE COUTSOUMARIS

ATHENS, GREECE

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THE LOCATION PATTERN OF GREEK INDUSTRY

THE CENTER OF ECONOMIC RESEARCH

The Center of Economic Research in Greece was established in the expectation that it would fulfill three functions: (1) *Basic research on the structure and behavior of the Greek economy*, (2) *Scientific programming of resource allocation for economic development, and* (3) *Technical-economic training of personnel for key positions in government and industry. Its financial resources have been contributed by the Greek Government, the United States Mission in Greece and the Ford and Rockefeller Foundations. The University of California at Berkeley participates in the process of selection of foreign scholars who join the Center's staff on an annual basis. It also participates in a fellowship program which supports research in Greece by American graduate students, as well as studies for an advanced degree in economics of Greek students in American Universities.*

Fellowships are also provided to young men who have graduated from a Greek University. They join the Center as junior research fellows for a three-year period during which they assist the senior fellows in their research and participate in seminars given by them.

The Center's main task, naturally, is the carrying on of research on key aspects of the Greek economy and on the fundamental policy problems facing the country in

its effort to develop rapidly in the framework of the European Common Market. This research is carried on by teams under the direction of senior fellows. The results will be published in a Research Monograph Series.

The lectures and seminars included in the Center's program are not for the benefit only of those working for the Center. Economists, scholars and students of economics are also invited to attend and participate in this cultural exchange which, it is hoped, will be carried out in co-operation with institutions of higher learning here and abroad. A Lecture Series and a Training Seminar Series will round off the publications program of the Center.

Another need which the Center has set out to meet is the establishment of a library and a bibliographical service in the economic sciences. Besides its usefulness for the education of the trainees of the Center, this service will be of particular interest to Greek economists in general.

It is contemplated that the Center will exchange information and results with similar Centers in other countries and will participate in joint research efforts with Greek or foreign public and private organizations.

Finally, one should emphasize that this is one more example of Greek-American co-operation, a pooling of human talent, funds and efforts, designed to promote the training of economists and help in meeting Greece's needs in the field of economic development.

The final aim is eminently practical: to help in creating a better life for the Greek people.

ANDREAS G. PAPANDREOU, Director

THE LOCATION PATTERN OF GREEK INDUSTRY

I

INTRODUCTION

There is a general concensus of public opinion in Greece that manufacturing industry has been concentrated too heavily in the Athens metropolitan area; that this situation is highly undesirable, and therefore should be corrected. Although this last belief is not based upon a well founded analysis of the pertinent facts, it has found its way into government policies which aim at promoting decentralization of industry toward the provinces in an effort to modify the present location pattern.

It is not our task here to analyse all the relevant problems associated with the question of location of industrial activity, particularly since a special study on the subject of Greece's regional development in general and location of economic activity in particular has been recently completed by Professor Benjamin Ward.[1] Our present

1. Cf. B. Ward, Problems of Greece Regional Development, Center of Economic Research, Athens, This is a broader study concerning the location of the economic activity in Greece, in connection with the problem of the country's overall economic development. For a search for empirical regularities and relationships see especially chapter 4 of the study.

discussion will therefore concentrate on those structural aspects of the locational distribution of the activity which relate most directly to Greek manufacturing and especially the adequacy and effectiveness of present policies which attempt at decentralizing manufacturing activity.

II

GEOGRAPHICAL DISTRIBUTION

To measure the degree of regional concentration of manufacturing activity certain pertinent indices and coefficients have been calculated from of the 1958 census of manufacturing establishments and from the annual survey of industry for the same year carried out by the National Statistical Service among major manufacturing establishments. The measurements refer to the relative spatial distribution of industrial plants, employment and output, by major industrial groups, and to the relative share of the various geographical regions in the nation's manufacturing activity. They embrace both industry proper and manufacturing crafts.

Table 1 gives the percentage distribution of all manufacturing establishments and of the industrial employment for the year 1958 among the greater Athens area, the seven major urban

centers of the country (Salonica, Patras, Volos, Larissa, Kavala, Khania and Irakleion) taken together, and the remaining parts of Greece. A similar distribution, including output, but confined to establishments of a size of 10 persons and over is shown in table 2. The latter table is in effect more representative of manufacturing activity as opposed the handicrafts.

The Census data for industry as a whole, including crafts, show that nearly 41% of the employment and 24% of the establishments are concentrated in the Athens metropolitan area. The lesser degree of concentration in the number of establishments makes immediately evident the relatively larger average size of the establishments located in the Athens area. The highest degree of concentration into greater Athens, is shown (in a ranking order) for printing and publishing, rubber products, manufacture of electrical equipment and appliances, non-classified items, basic metal industries, paper and paper products, transport equipment and textiles. In contrast, food processing industries, beverages, footwear and clothing, manufacture of wood products, chemicals, and leather processing are more evenly distributed.

Again in the survey data (table 2) the concentration into the Athens area appears heavier for the larger size establishments than for craft man-

ufacturing, with over 50% of total employment and output of this category congregated in that area. More specifically, there is an overwhelming concentration in the Athens region of petroleum derivatives, manufacture of metal products, electrical equipment and applicances, miscallaneous items, footwear and clothing, furniture, non-metallic mineral products, transport equipment, rubber products, basic metal manufacture and chemicals. The degree of concentration is even greater in terms of output, due, as was said, to the relatively larger size of the establishments located in the area. By contrast, light industries such as foodstuffs, beverages, tobacco, and leather products show a much lesser degree of preference for the Athens area.

It is evident from the data that the heavier concentration in the Athens region is confined primarily in the heavy, relatively speaking, industries in which minimum scale requirements, because of technological conditions, are of decisive importance and whose products are the so-called «national» ones.[1] Light consumer goods industries,

1. From a regional standpoint commodities are classified into «regional» and «national» ones. «National» commodities are those sold throughout the whole country and hence travel distances between the place of their origin and that of actual utilization. Regional, on the other hand, are those locally produced and used. Cf. Wassily Leontief, «Interregional Theory», in Studies in the Structure of American Economy, Oxford University Press, 1953.

TABLE 1

REGIONAL DISTRIBUTION OF MANUFACTURING INDUSTRY IN GREECE, 1958

Code ISIC	Industry Group	Employment Ratios in % of total			Establishments Ratios in % of total		
		Athens Area	7 main cities	Rest of Greece	Athens Area	7 main cities	Rest of Greece
		(1)	(2)	(3)	(4)	(5)	(6)
2-3	**Total Manufacturing**	**41**	**16**	**43**	**24**	**13**	**63**
20	Food industries, except beverages	28	18	54	12	10	78
21	Beverage industries	20	18	62	9	11	80
22	Tobacco manufactures	40	39	21	10	56	34
23	Manufacture of textiles	52	20	28	41	15	44
24	Manufacture of footwear, other wearing apparel and made-up textile goods	38	15	47	26	15	59
25	Manufacture of wood, and cork, except furniture	23	13	64	13	9	78
26	Manufacture of firniture and fixtures	49	19	32	38	19	43
27	Manufacture of paper and allied industries	58	28	15	69	23	8
28	Printing, publishing and allied industries	74	13	13	63	14	23
29	Leather, fur and allied products, except footwear and other wearing apparel	36	14	50	29	18	53
30	Rubber industries	74	21	5	47	18	35
31	Chemical industries	25	3	72	5	2	93
32	Petroleum and coal derivatives industries	47	1	52	83	11	6
33	Manufacture of non-metallic mineral products, except by-products of petroleum & coal	39	13	48	25	10	65
34	Basic metal industries	58	7	35	82	4	14
35	Manufacture of metal products, except machinery & transport equipment	48	13	39	22	12	66
36	Manufacture of machinery & appliances, except electrical ones & transport equipment	47	29	24	41	25	34
37	Manufacture of electrical machinery, apparatus, appliances and supplies	69	15	16	54	20	26
38	Manufacture of transport equipment	53	20	27	28	17	55
39	Miscellaneous manufacturing industry	68	14	18	52	18	30

Source: National Statistical Service of Greece, Census of Industrial Establishments, 1958, Publ. Industry L:l.

(2) These cities are: Salonica, Patras, Volos, Larissa, Kavalla, Khania and Irakleion.

TABLE 2

DEGREE OF CONCENTRATION OF MAJOR MANUFACTURING FIRMS IN THE ATHENS METROPOLITAN AREA, 1958.

(Establishments of 10 persons and over)

Code ISIC	Industry Group	Employment %	Establishments %	Output (v.a.) %
2-3	**Total Manufacturing**	**53.2**	**45.7**	**55.7**
20	Food industries, except beverages	34.7	37.5	44.7
21	Beverage industries	26.4	18.3	32.6
22	Tobacco Manyfactures	17.7	7.8	17.1
23	Manufacture af textiles	55.0	53.3	57.4
24	Manufacture of footwear, other wearing apparel and made-up textile goods	74.7	66.8	78.2
25	Manufacture of wood, and cork, except furniture	41.2	40.6	58.8
26	Manufacture of firniture and fixtures	78.6	66.5	80.5
27	Manufacture of paper and allied industries	52.6	82.7	42.1
28	Printing, publishing and allied industries	80.7	72.4	89.6
29	Leather, fur and allied products, except footwear and other wearing apparel	37.4	37.6	52.3
30	Rubber industries	68.0	73.5	61.4
31	Chemical industries	57.1	14.4	72.8
32	Petroleum and coal derivatives industries	100.0	100.0	100.0
33	Manufacture of non-metallic mineral products, except by-products of petroleum and coal	70.5	33.3	56.8
34	Basic metal industries	65.8	73.9	47.7
35	Manufacture of metal products, except machinery and transport equipment	81.8	79.0	80.4
36	Manufacture of machinery and appliances, except electrical ones and transport equipment	48.7	52.4	56.1
37	Manufacture of electrical machinery, apparatus, appliances and supplies	82.5	87.4	86.8
38	Manufacture of transport equipment	69.2	66.3	69.8
39	Miscellaneous manufacturing industry	82.4	77.7	86.0

Source: National Statistical Service of Greece, Annual Industrial Survey, Pub. L:3, 1961.

especially these that are material-oriented, or of a handicraft nature, tend to be more evenly distributed among the various regions of the country.

Salonica is shown to be the second significant locational center of industrial activity with a «fair» share in the manufacture of leather, tobacco, beverarges, wood products, footwear and clothing and some other light manufacturing. This region's share in these activities usually varied between 18% to 25% of the total national employment on each corresponding group. Of the other geographical regions, the Peloponesus has a significant share of the paper and chemical industries, while the share of the remaining regions represents a minor fraction of the country's total manufacturing activity.

III

DEGREE OF REGIONAL CONCENTRATION

To measure the locational structure of industry, and to make certain structural comparisons among regions, the commonly used coefficients of localization and location quotients have been employed.[1] The respective computations refer, as

1. See for a detailed description of the properties of these concentration indices in Walter Isard, *Methods of Regional Analysis*, J. Wiley and Sons, New York, 1960, chapter 7.

TABLE 3

COEFFICIENTS OF LOCALIZATION OF GREEK MANUFACTURING INDUSTRY, 1958

Code ISIC	Industry Group	Total Manufacturing			Firms of size 10 persons and over		
		Employment		Establishment	Athens to Remaining Greece		
		By major cities*	By Regions*	By Regions*	Employment	Establishments	Output (Val. a.)
		(1)	(2)	(3)	(4)	(5)	(6)
20	Food industries, except beverages	0.46	0.156	0.19	0.08	0.11	0.07
21	Beverage industries	0.06	0.028	0.27	0.27	0.23	0.21
22	Tobacco Manufactures	0.79	0.090	0.36	0.38	0.39	0.44
23	Manufacture of textiles	0.65	0.156	0.02	0.10	0.02	0.16
24	Manufacture of footwear, other wearing apparel etc.	0.23	0.103	0.22	0.21	0.23	0.02
25	Manufacture of wood, cork etc.	0.12	0.102	0.12	0.05	0.03	0.10
26	Manufacture of furniture & fictur.	0.16	0.052	0.25	0.21	0.25	0.10
27	Manufacture of paper & allied industries	0.14	0.042	0.01	0.37	0.14	0.37
28	Printing, publishing & allied industries	0.11	0.056	0.28	0.27	0.34	0.31
29	Leather, fur & allied products, except footwear etc.	0.08	0.040	0.16	0.08	0.03	0.09
30	Rubber industries	0.08	0.028	0.15	0.28	0.06	0.21
31	Chemical industries	0.24	0.394	0.04	0.31	0.17	0.42
32	Petroleum & coal derivatives industries	0.01	0.010	0.47	0.54	0.44	0.55
33	Manufacture of metal prod. except machinery & transport equipment	0.16	0.056	0.29	0.33	0.25	0.05
34	Manufacture of non-metallic miner. products, etc.	0.18	0.072	0.17	0.12	0.01	0.08
35	Basic metal industries	0.05	0.032	0.13	0.28	0.08	0.63
36	Manufacture of machinery & applianc. except electrical ones etc.	0.12	0.039	0.045	0.07	0.004	0.18
37	Manufacture of electrical machinery, apparatus, appliances & supplies	0.11	0.051	0.29	0.42	0.31	0.25
38	Manufacture of transport equipment	0.19	0.098	0.16	0.21	0.14	0.17
39	Miscellaneous manufacturing industry	0.08	0.032	0.29	0.32	0.30	0.23

Source of data: Census of Manufacturing establishments, 1958, op. cit.

* Cities included in the Calculation: Athens, Salonica, Patras, Volos, Larissa, Kavalla, Khania, Irakleion. Regions included are: (1) Attica and Central Greece; (2) Peloponisos and Ionian Islands; (3) Macedonia and Thrace; and (4) Epiros, Aegean Islands and Crete.

TABLE 4

LOCATION QUOTIENTS FOR GREEK MANUFACTURING INDUSTRY IN 1958

(Establishments of size 10 persons and over)

Code ISIC	Industry Group	Athens Metropolitan Area			Rest of Greece		
		Employment	Establishments	Output (v.a.)	Employment	Establishments	Output (v.a.)
		(1)	(2)	(3)	(4)	(5)	(6)
20	Food industries, except beverages	0.65	0.82	0.80	1.40	0.15	1.25
21	Beverage industries	0.50	0.40	0.59	1.57	1.50	1.52
22	Tobacco Manufactures	0.33	0.17	0.31	1.76	1.70	1.87
23	Manufacture of textiles	1.03	1.17	1.03	0.96	0.86	0.96
24	Manufacture of footwear, other wearing apparel & made-up textile goods	1.40	1.46	1.40	0.54	0.61	0.49
25	Manufacture of wood, & cork, except furniture	0.77	0.89	1.06	1.26	1.09	0.93
26	Manufacture of furniture & fictures	1.48	1.46	1.45	0.46	0.62	0.44
27	Manufacture of paper & allied industries	0.99	1.81	0.76	1.01	0.32	1.31
28	Printing, publishing & allied ind.	1.52	1.58	1.61	0.42	0.51	0.23
29	Leather, fur & allied products, except footwear & other wearing apparel	0.70	0.82	0.94	1.34	1.15	1.08
30	Rubber industries	1.28	1.61	1.10	0.68	0.49	0.87
31	Chemical industries	1.07	0.32	1.31	0.92	1.58	0.61
32	Petroleum & coal derivatives industry	1.88	2.19	1.80	—	—	—
33	Manufacture of non-metallic mineral products ets.	1.33	0.73	1.02	0.63	1.23	0.98
34	Basic metal industries	1.24	1.62	0.86	0.73	0.48	1.18
35	Manufacture of metal products, except machinery & transport equipment	1.54	1.73	1.44	0.39	0.39	0.44
36	Manufacture of machinery & appliances, except electrical ones etc.	0.92	1.15	1.01	1.10	0.88	0.99
37	Manufacture of electrical machinery, apparatus, appliances & supplies	1.55	1.91	1.56	0.37	0.23	0.30
38	Manufacture of transport esuipment	1.30	1.45	1.25	0.66	0.62	0.68
39	Miscellaneous manufacturing industry	1.55	1.70	1.54	0.38	0.41	0.32

Source of data: Annual Industrial Survey, 1958, National Statistical Service of Greece, Publ. Industry L:3.

was said, to the year 1958. The coefficients of localization which are given in table 3 indicate the degree to which a given industry is distributed among regions as compared to the base magnitude, that is the degree of industrial dispersion as a whole. The values of the coefficients can vary between O and 1. If the industry is distributed exactly the same as is the base magnitude, the value of the coefficient will be zero, while a value unity indicates the concentration of the entire industry in one area. The location quotient (table 4), on the other hand, shows the relative share of the specified industry belonging to a fiven region. Where the «quotient» is less than unity, the given region has less than its «fair» share in the industry in question, and where above unity it has more than its «fair» share.

Coefficients of localization were computed: (1) For total industry, including small-size handicrafts, by (a) major cities (urban-centers) and (b) major regions; (2) for major establishment (of a size of 10 persons and over), with respect to the Athens area, on the one hand, and the rest of Greece as a whole on the other. The computations refer to both employment and the number of establishments in the former case, while in the latter case output is included too. The two region classification (Athens vs remaining Greece) was applied also to the location quotients, but

the measurement in this case was restricted to the group of establishments which make up industry proper (establishments of over 10 persons).

The computed coefficient of localization for industry as a whole, including crafts, shows a relatively heavy locational concentration in certain areas of tobacco, textiles and food processing industries, and to a secondary extent in the manufacture of footwear, clothing, and chemicals. Particularly with the large-size establishments a relatively heavy degree of concentration, reflecting evidently the attraction of the Athens area, is shown for the rather heavy producer good industries, such as petroleum refining, manufactures of metal and production of electrical equipment and appliances, and for various durable goods industries, printing and publishing, furniture and tobacco manufactures.

The location quotients, on the other hand, indicate that the Athens area has attracted a more than «fair» share of all the above listed industry groups as compared with the other regions, and also of the manufacture of footwear and clothing, non-metallic minerals and transport equipment. A less than «fair» share for Athens is shown, however, in the processing of foodstuffs, beverages and tobacco manyfactures.

It becomes evident from the above indicators that a relative disproportional concentration of

industries in the Athens region does exist. Concentration is especially strong in industries producing intermediate and investment goods or heavy durable consumer items.

Furthermore, the indicators show the absence of any serious degree of regional specialization in manufacturing activity, except to some extent in the tobacco industry, and in other minor groups not shown in the two-digit classification used in our analysis. Evidently, this is consistent with Greece's lack of any massive geographical concentration of natural resources that would lead to such a regional specialization.

IV

DETERMINANTS OF THE PRESENT LOCATIONAL PATTERN

Judging from the present regional distribution of manufacturing activity in Greece, one is led to the conclusion that its locational structure is, to a very large extent, consistent with accepted criteria of location theory, given the other overall conditions of the Greek economy. Manufacturing firms apparently have not acted irrationally in their task of choosing their optimum location, in the sense of selecting the location with conditions which would, *ceteris paribus*, maximize

net revenue (locational equilibrium).[1] Moreover, the pattern is indicative of a slow, undunamic expansion process which seems to have characterized the development of the Greek economy in the prewar years.[2]

Given the investment opportunities, the fundamental guide to the individual manufacturing firm in its choice of location is, as is known from our location theory, the comparative cost schedule of alternative sites. Thus cost information is required on the basis of the geographic distribution of raw and other working materials, of labor, power and other inputs, in addition to information on the established or anticipated pattern and location of the markets to be served, in order to make locational comparisons.

The most important factors usually considered by individual manufacturing firms in making location decisions are the following:

(1) The direct cost of access to the various inputs utilized, including transport facilities for moving both inputs to the processing site and outputs to their consumers.

(2) The size and the other characteristics of the market which relate to (a) the cost and reg-

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1. See Walter Isard, op. cit. Also Edgar M. Hoover, Location of Economic Activity, Mc Graw-Hill, N.Y. 1948.

2. Cf. about it our forthcoming study on Morphology of Greek Industry.

ularity of transportation and (b) the scale of operation and bence the development of internal economies (or diseconomies) of scale.

(3) The occurence and the magnitude of the various external economies (or diseconomies) to the individual firm because of location, which location theorists have grouped under the concepts of *localization* and *urbanization* economies.[1] Localization economies depend on accessibility to buyers, a full utilization of diverse specialized facilities, markets for by-products or opportunities for waste disposal etc. and are usually found in light consumer good industries. They are generally not found in heavy industries where economies of scale are likely to be much more impor-

1. Conceptually, all types of economies associated with a particular location are usually placed under the general term of «agglomeration» economies or diseconomies. Such are of (a) scale, (b) localization and (b) urbanization (regionalization).

E c o n o m i e s o f s c a l e refer to those achieved through changes in the level of a given activity, the level of other activities and other external variables being held constant. L o c a l i z a t i o n e c o n o m i e s confine to those obtained when plants of a similar character congregate at one site. Finally, u r b a n i z a t i o n economies, though closely associated with localization economies, are those which emerge when various not related plants congregate around one site, i.e. are spatially juxtaposed rather than geographically separated. In general, they emerge for all firms, in all industries at a single location, consequent upon the enlargement of the total economic size (as determined by population, income, output or wealth) of that particular location for all industries.

Cf. Edgar M. Hoover, o p. c i t. and W. Isard o p. c i t. pp. 400-410.

tant. On the other hand, urbanization economies emerge where greater use is made of (a) infrastructure facilities, (b) a finer articulation of economic activities usually found in urban structures; (c) national and municipal administrative facilities, education, recreational facilities and (d) social welfare gains.

Urbanization diseconomies arise from regional differences in costs of living, money wages, wasting of time, land values, rents, or from the absence of any of the economy creating facilities listed above.

It is the net balance of these attracting and repelling forces which must in the final analysis determine the optimal location of a particular manufacturing plant. In general, entrepreneurial ability, organization and scale of output vary from firm to firm and hence each firm faces a different cost situation.

Deviation from the such an optimal location is of course possible, and as a matter of fact, is quite common in less developed countries. Much depends on other conditions, such as the nature and degree of tariff protection, the availability of skilled entrepreneurs, government intervention in setting transportation prices and certain sociological characteristics of the entrepreneurial class and/or its other personal interests and pursuits.

With these determinants of location in mind,

we find an appreciable correlation between regional concentration of Greek industry and the cost structure of the various industrial groups. The relative importance of production expenditure on working materials is shown to be inversely related to the degree of concentration of industrial activity as measured by the location quotient (see graph). The strength of this relationship is particularly significant when one considers the countervailing influence of certain other non-economic factors.

It is evident that raw-material oriented industries show a rather satisfactory degree of dispersion or at least a tendency to locate outside of greater Athens. Such industries with low location quotients for the Athens area are food processing industries, tobacco manufacture, beverages, and those chemicals which use large quantities of local agricultural materials (e.g. soap, oil refining and similar activities).

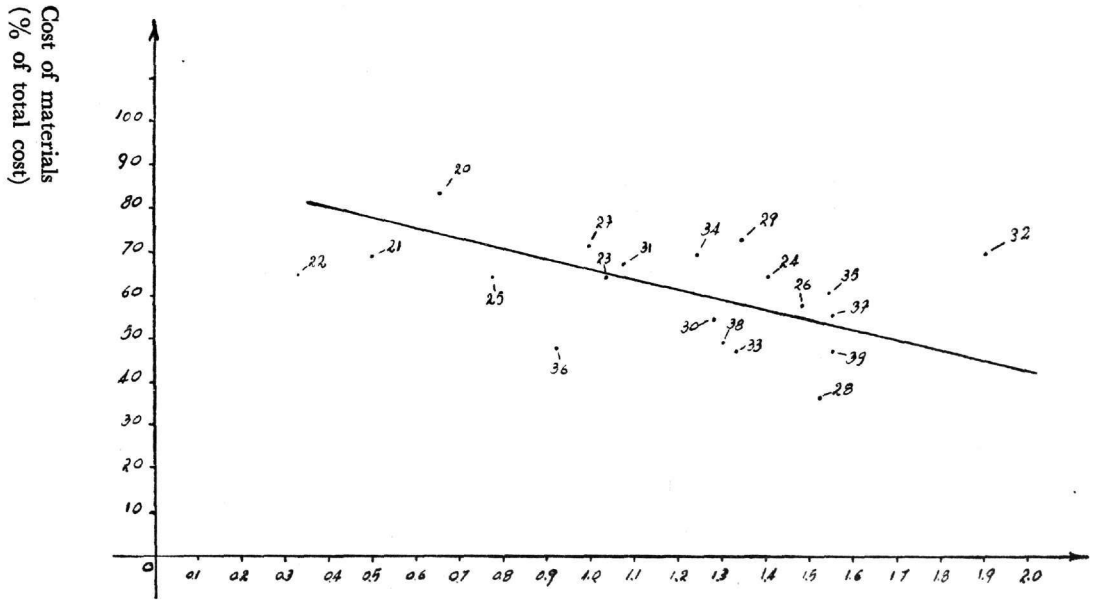
By contrast, industries in which other than raw material costs count heavily, tend to be market-oriented, and thus to concentrate in a few urban centers and particularly in the Athens area. This shows that the size of the market, economies of scale, economies of localization and economies of urbanization (agglomeration) become more dominant as attracting forces in all industries other than those heavily dependent on Greek agricultural products. In general, *the market orientation is*

the primary opportunity factor in attraction in the locational distribution of Greek manufacturing activity.

Notwithstanding, market-oriented industries in which severe technical indivisibilities of production do not exist, have a more balanced spatial distribution. Examples of this occur in the manufacture of metal products, appliances, wood products where economies of scale are not as strong and thus small scale and craft production persist together with geographical dispersion. The footwear and clothing industry is an exception to this since it has a relatively high degree of concentration in the Athens area in spite of its small size and craft production structure. Localization economies stemming from access to raw materials other than those of a farm origin, availability of specialized labor and proximity to the market seem to be responsible for the disproportional concentration of this group of activities in the Athens area.

Apart, however, from the above special case of the footwear and clothing industry, the majority of the remaining non-raw-material-oriented industries (including fuel oriented industries) show a more than proportional concentration in the Athens area. Apparently, economies of scale and «agglomeration» effects weigh more heavily as attracting forces than the transport of materials, and are responsible for the observed concentration. The localization of these industries in the

DIAGRAM. Relationship between cost of materials and Degree of Industrial Concentration.
(Establishments of 10 persons and over)



Athens area is therefore economically justified.

The size, on the other hand, of the immediately accessible market for the Athens area provides the attractive opportunity of a much larger scale of operation than any other location site in Greece, given of course the conditions which prevail in the transportation system and other servicing facilities. The latter factor at present, in hardly conducive toward the concentration or production into larger units in locations outside Athens. As a result, the production on a national scale by plants located in the provinces, even for light consumer good industries, is burdened by sizable diseconomies of «regionalization».

In more concrete terms, the factors which give locational advantages to Athens over the other regions (and hence are responsible for attracting in that particular area most of the non-raw material oriented industries) are in brief as follows:

(1) The Athens area congregates the largest portion of family (household) expenditures for manufactured goods and perhaps of all expenditures for products of final consumption. A rough estimate for the year 1958, based on the household survey, runs as follows:[1]

1. The estimate was based on the Household Survey of 1958, op. cit. The average income per capita for the respective urban areas was derived from the same survey by C. Delis («Κατανομὴ Εἰσοδημάτων Ἀστικοῦ Πληθυσμοῦ, Δελτίον Οἰκονομικῶν Πληροφοριῶν, Νοέμβ. - Δεκέμβριος 1961, σελ. 20-29.

	Percent of total expenditures for industrial products by urban households
Greater Athens	61.4
Salonica	8.6
Cities between 30.000 and 80.000 inhabitants	15.2
Cities of 10.000 to 30.000 inhabitants	14.8
Total	100.0

It is evident from this distribution that greater Athens represents the largest single market for manufactured consumer goods due to the large urban concentration and the comparatively higher incomes (average income per capita in Athens appears to be 40% higher than the national average).[1] The market share of the Athens region is even greater, going up to 80% of the total expenditures of the Greek urban households for such goods, if the urban centers of the southern part of Greece (to which firms located in Athens have easier access compared with the other major center of Salonica) are also included. This leaves the Salonica region with influence on only 20% of the urban consumers demand for manufactured goods.[2]

1. Cf. S. Geronymakis «Regional Distribution of National Income», Oekonomiki Poreia, Dec. 1961.

2. This explains to a great degree the observed declining attractiveness of the Salonica area as an industrial location. See the aforementioned study by Professor Benjamin Ward of the Center of Economic Research.

This single fact, combined also with the interrelationships which usually exist among industries (especially between those producing for final consumption and those turning out intermediate goods), and the mutual dependence of their markets, give to the Athens region an over-whelming advantage as a site of industrial location.[1] The size of the market by being a basic determinant of the scale of operation conditions also the ability of the manufacturing firm to grow towards its optimum size and hence to benefit from economies of scale. This notion is so common that it hardly requires further amplification. It should not be strange, therefore, that the Athens area presents for most manufacturing firms the most economical location in the country, at least from a market point of view.

(2) The dependence of a great many Greek manufacturing industries upon imported working materials, is the second major determining force. Access to the less expensive facilities of the Piraeus port represents another major source for economies and thus a locational advantage for

1. An inter-industry matrix of input-output (or inter-activity matrix) showing the inter activity linkage in quantitative terms would make this point and the degree of industry interdependence even more clear. Existing statistical data from manufacturing censuses, however, do not provide any detailed information of industrial production in a way that would enable the construction of such an inter-industry matrix.

industries based on imported working materials as compared with any other prospective location site with port facilities.

(3) The Athens area appears to offer to the individual manufacturing firm the largest, external agglomeration economies (localization and urbanization). For instance, Athens still has a lower rate for electric energy for industrial users than any other center of the country. Also, the recent establishment of the oil refinery in this area increased further the advantage of the Athens region due to the cost differentials of energy and fuels. Such economies become even greater once industrial concentration in an area, no matter under what impetus, has proceeded enough to affect the size of the local market. By becoming from an early period the country's commercial, administrative, financial and social center, the greater Athens area has concentrated investments and developed definite location advantages for the establishment of manufacturing firms. Such conditions by creating opportunities of investment have become centrifugal forces for the attraction of new industries far stronger than the repelling influence of diseconomies stemming from excessive urbanization associated with a higher cost of living, higher money wages, etc.

(4) Finally, the factor management (including entrepreneurship) in Greece is not as mobile in

space as is customarily assumed. Location theory usually assumes capital and management to be perfectly mobile in space, and hence as not presenting obstacles to the regionalization of the industrial activity. In Greece, however, entrepreneurship and industrial management in general are primarily localized in the Athens area and only to a very lesser extent in Salonica and the other major urban centers of the country. The Greek entrepreneur appears to be quite immobile in space, and it has a strong preference to locate his business activity as close as possible to his living quarters, unless there is special strong motivation (such as accessibility to his raw materials requirements) which may pull him elsewhere. The reasons for such immobility of management may of course be numerous. There are, however, two factors which appear to be of particular relevance to the Greek situation, namely: (a) the attractiveness of social life in the nation's capital and the offered greater opportunities for social advancement, and (b) the fact that entrepreneurship and management coincide actually in almost every Greek industrial firm. And wherever a separation of the two elements (limited only to a very few large firms) does exist, there is always the need for a close supervision on the part of the owner entrepreneur because of the lack of capable and trusted professional managerial talents

and the inability of management to exercise from a distance full and effective control over production operations.

We may conclude from the foregoing discussion that as long as the above conditions remain in force, the attracting power of the industrial complex of the Athens area as a location site for manufacturing industries will remain unaffected; unless of course stronger repelling forces are developed or created and/or the attractiveness of other areas in made (through subsidizing of their location) strong enough to exercise a countervailing force. This finding bears seriously on any deliberate government effort to influence the present forces which determine the location of industrial activity in Greece and hence to modify the present location structure.

To repeat, the main conclusion of the foregoing analysis is that the *locational pattern of the Greek manufacturing industry is fundamentally consistent with the operating economic forces. The observed concentration of manufacturing firms in the greater Athens area is nothing but the natural outcome of past conditions and expectations which have led the individual firms to search for the «optimum» location of their plants. The minor exceptions can be attributed to non economic considerations.*

V

NOTE ON GOVERNMENT POLICY TO DECENTRALIZE MANUFACTURING ACTIVITY

As was already mentioned, the Greek Government has recently embarked upon a policy of promoting the establishment of industry in the provinces. This is not of course something peculiar to Greece. A great many countries are currently pursuing «regionalization» policies in an effort either to correct economic and political imbalances between regions, or/and to get away from problems of excessive urban concentration.

The notion behind these policies is that if new locations can be started, the industrial activity will have a stimulating effect on the area surrounding.[1] This understanding is result of improvement in recent post-war years in our knowledge of the mechanics of the process of economic development. Regional studies in the United

1. To put it in the terms of the tripartite hypothesis proposed by Schultz: (1) Economic development occurs in a specific locational matrix; (2)these matrices are primarily industrial-urban in composition; and (3) existing economic organization works at or near the Center of a particular matrix of economic development. In general, development has certain locational attributes and it appears to have its mainspring in an industrial-urban complex. See, T. W. Schultz, The Economic Organization of Agriculture, McMillan Co., New York, 1953, ch. 9; also, W. Isard Location and Space-Economy, op. cit., chapter 1.

States and elsewhere give ample empirical support to the existence of such a relationship.[1]

The desire to cope with excessive urban concentration in the Athens area must also be a motivating factor behind the program. This tendency has admittedly been of sizable proportions in the post-war years with evidently heavy demands on social overheads.

The measures of the Greek government in this respect are too recent to have exerted any significant influence on regional dispersal of industry and thus it is too early to make an appraisal. Nevertheless, some comments, on a priori grounds, on the possible effectiveness of the program with respect to its primary objective and perhaps on its probable effects on industry's productive efficiency are in order at this point. But before we get into its particular merits or demerits, a brief

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1. See for empirical inquiries on this particular point in William Nickolls. «Industrialization, Factor Markets, and Agricultural Development» The Journal of Political Economy, Vol. LXIX (Aug. 1961) and «The Effects of Industrial Development on Tennessee Valley Agriculture, 1900-1950», Journal of Farm Economics, Vol. XXXVIII (1956); also in Anthony M. Tang, Economic Development in the Southern Piedmont, 1860-1950; Its Impact on Agriculture, Chapel Hill; University of North Carolina Press, 1958. Based on this particular notion is also Zolotas' proposition about the creation or such industrial complexes as a means to promote Greece's regional development. See. X. Zolotas, Regional Development Policy, Bank of Greece, Athens, 1961.

résumé of the main features of the dispersal program are in order:

(1) Generally the program consists of incentives which aim to attract industries to the provinces.[1] It relies, to its largest extent, on indirect subsidization in the form of tax credits, tariff exoneration and reduced rates of the various contributions which presently burden the manufacturing firms. The non-tax provisions are of minor importance at least in monetary terms, and hence of doubtful effectiveness with respect to the objective pursued.

(2) There is no specific provision whatsoever as toward what regions the decentralization should be oriented. The only broad distinction provided is for industries which will be established outside the *Athens area* and either in the *provinces of the mainland* or in the *Islands*. The obvious implicit assumption in this distinction between mainland and islands is (a) the existing unfavorable income divergencies between the islands and the regions of the mainland and (b) the increased transportation costs (localization diseconomies) which the establishment of a factory in the islands implies in connection with the moving of the produce to the markets. How far these underlying

1. The policy appears to have first been introduced in 1952 by Decree No 2176. It was formalized however on a broader basis by Legislative Act No 3213/1955, 4002/1959 and 4171/1961.

assumptions are valid cannot be assessed without specific investigation into the comparative structure of the transport costs of the various potential regional industrial sites of the country, with respect to both the supplies of materials and the markets for the products.

(3) The program as such indicates two further underlying assumptions of the policy pursued: first, that the establishment of a manufacturing firm in an area outside Athens does involve diseconomies because of location and/or (b) that the establishment in the provinces is not attractive to Greek entrepreneurs (management immobility). Therefore, a relatively higher rate of profits becomes necessary in order to lure them away from the Athens area.

(4) The program makes no distinction whatsoever as to the kind of industries which should be pushed toward the regions. The benefits are indiscriminately granted to any manufacturing firm that would be willing to establish its plant anywhere as long as it is outside of greater Athens.

(5) Only to a limited extent do the awarded benefits affect directly the cost structure of the firms concerned. Such cost affecting benefits are those referring to (a) exemption from local taxes; (b) reduced rates of contribution to the Social Security Organization; (c) exemption from contributions paid by the firms to various orga-

nizations; and (d) reduced amortization costs because of the lower cost of investment which the tariff exoneration on imported equipment implies.

It is difficult of course to assess in concrete numerical terms the effects of such benefits on the unit-cost of production of the particular manufacturing firms. The largest portion of the benefits must be represented by the income tax credits which appear to go up to practically full exemption from any income tax payments, at least for the period provided by the measure.

It is not of course our purpose here to get into a detailed analysis of the various implications which the measure may have. Such an endeavor would be outside our scope. Instead, the intention is to pose certain questions concerning the effectiveness of the adopted means and the adequacy, and perhaps the wisdom, of the industry deconcentration policy in the way it has been conceived and is being applied.

It is necessary perhaps at this point to state again the main conclusion of our analysis thus far: The location structure of the Greek manufacturing industry is in accordance with the operating economic forces and existing relationships. Such relationships concern: (a) the direct cost of moving inputs and outputs given the geographical distribution of the local raw materials and of the

markets for industrial products; (b) the regularities and other market characteristics in the purchase of inputs and the shipment of products; (c) conditions in transport and hence the direct and indirect costs involved; (d) the least costly access to imported materials; and (e) the emerging concitions of the so-called «agglomeration» economies and diseconomies and of the scale of operation.

Judging the set of measures (on which the program relies for the attainment of its objective) in the light of the foregoing conclusions, we may state that the major weakness of the program is its failure to link the measures to specific regional industrial locations consistent with objectives of an industrial development policy. Luring industries toward the provinces without any distinction in the type of manufacturing activity, or any consideration of the specific effects of the location upon the industry's cost levels does not contribute to a sound industrial development.

In fact, industries which are by their nature material-oriented tend to be established near the location of the materials they process, in as was indicated above (at least in terms of broader industry groups). Greek manufacturing firms falling in this category do not appear to have shown irrationality in their choice of the most economical location. The granting of special benefits to such industries in order to induce them to be

established in the provinces does not serve any purpose and it only results in an unjustified subsidy to the respective firms. Such measures would be justified only if: (a) resources available in the provinces remain undeveloped because of failure of the entrepreneurs to take the lead because of inertia or inefficient profitability, and (b) firms of material-oriented industries are uneconomically located in the Athens area because of management immobility or other factors of a social character. The latter is rendered possible by strong tariff protection and the absence of adequate market competition, which enable the respective firms to disregard the effects of the locational diseconomies.

Furthermore, the question remains as to whether the benefits provided by the program are sufficient to offset other difficulties or diseconomies involved in the development of such industries. There remains also the fundamental question as to whether idle and undeveloped resources (which private entrepreneurship has neglected to take over) do exist in the various regions. If they do exist, the situation calls for an entirely different type of program, one that would be more effective in coping with immobility of factor supply.

The problem remains of course for the «non-material-oriented» industries for which other forces exert a dominant influence on location. Trans-

port costs with respect to the markets, economies of scale, and urbanization economies appear to be of decisive importance in determining the location of such industries. A meaningful policy in this case — aiming at decentralizing industry without ill effects upon the productive efficiency of the producing firms - must make a clearcut distinction between industries or firms producing «national» commodities and those producing «regional» ones. Given the present structure of Greek industry, the latter type must include small-csale production units, whose present departmentalization is a clear indication of the relatively minor importance which the economies of scale exert on their cost as compared with the direct costs of moving their produce to the market. In this case the measures adopted are not very meaningful, in the sense of serving a predetermined goal. The only exception is with the provision concerning the merger of regional firms aiming to encourage the creation of larger units. Yet this provisions too is of doubtful effectiveness.

There remains the bulk of industries and firms producing on a national scale. To such firms direct transportation costs, economies of scale, and agglomeration economies are of major influence with respect to their location. Any effort to decentralize industrial activity of this type cannot neglect cost differentials created by such factors

without damaging the efficiency of the manufacturing firms and their capacity to compete. A policy aiming at offsetting centripetal locational forces must concentrate primarily on measures that would increase the attracting power of alternative regional sites and do this in a way that will not impair the locational equilibrium of the respective firms. The subsidization of specific industrial locations would be a more appropriate means in this respect.

This approach implies that the measure should be primarily concerned with (a) the offsetting of transport cost differentials, (b) the creation of localization economies through investment in social, industry-servicing, over-heads, and (c) the other external (localization) economies created from the concentration of complementary activities in the same area.[1] Efforts of the government

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1. Certain «economies» are mobile and hence facilitate a decentralization of localization. «Economies» become mobile when incorporated in materials (through improvements in techniques of the inputs producing industries). But when they are incorporated in services, they are not easily transferable and hence decentralization is not easy. Industry therefore is attracted not only toward the locations with cheap factors but also toward the immobile ones. See on this, E.A.G., Robinson, o p. c i t., pp. 124-126.

The point is of particular significance whensuch mobile economies are incorporated in imported materials. Rigid tariff policies in this case may block the industry's progress by obstructing technological substitution which, as Professor Chenery's recent empirical studies have shown, constitute a major factor in industrial growth. Cf. Hollis Chenery, o p. c i t. An example of this type of

to promote decentralization of industry will fail if the diseconomies that will be created from dispersal of industry will offset the economies enjoyed from the tax benefits of the program.

The outlined measures may prove effective, in coping with immobility of entrepreneurship, when the concentration of industry in the Athens area is caused not by economic forces but by social factors. In this case, increasing the profitability of the firm through tax credits may lure manufacturers to establish their plants away from Athens. Nevertheless, this factor is probably of rather minor importance as a pulling force toward the Athens area.

The probabilities are that the current measures either will be without any significant effect on their objective of decentralization, or it may result in driving industries into uneconomic locations, thus accentuating the inefficiency problem which currently faces Greek manufacturing industry.

A policy that deliberately seeks to divert industrial firms away from their optimum location can be justified only if it aims (a) at reducing serious regional income disparities and (b) at giving rise to the creation of industrial-urban com-

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obstacle may be found for instance in the protection of the local glass container industry in Greece against imported can containers needed for the development of certain type of food industries.

plexes that would initiate development in the respective regions. In both cases a policy of industry regionalization would be acceptable, since it is consistent with specific goals, but it has to be tied up with specific regional development programmes or specific welfare objectives. In such instances the community may delibarately undertake to pay for the inefficiencies involved, as the price for achieving certain development or welfare goals. Measures, however, designed to serve the indiscriminatory and in many respects vague purpose of luring industry away from the Athens area are not very meaningful. Instead, they may produce, as was said, ill-effects by inducing the establishment of industries in uneconomic locations.

Normally, it is risky and in many respects uneconomic to force firms to decide on other than economic criteria. The present policy of motivating business to act on a non-economic basis in the location of their plants contributes little toward the healthy development of the country's manufacturing industry. Such risks are not easily taken under conditions of competition, but under the present circumstances of strong tariff protection and restricted competition, inefficient locations may easily be chosen under the stimulus of monetary benefits. The important question, however, is whether the government policy should at this

moment contribute deliberately to the creation of structural inefficiencies in the country's industrial activity, in sight of the conditions that will be developed from Greece's association with the European Common Market. The decision to join the common market demands that regional allocation of resources be efficient. The program does not seem to contribute to such a purpose.

The foregoing analysis does not imply of course that a continuous concentration of manufacturing industries in the Athens metropolitan area is desirable or that it should be tolerated. On the contrary, what we want to stress is that a government policy aiming at decentralizing industry must work through the economic forces which determine location and in a way that will not impair the long run efficiency of the producing firms. Thus changes in differentials of transport costs and transport facilities among regions, in the supply and location of raw materials, in the cost of overhead industrial services and the like will be more effective in altering the location pattern of industry without affecting at the same time the cost structure of the individual firms.

To sum up, decentralization or regionalization policy can be based upon other than economic criteria: Goals such as national security, or income equalization between regions may be equally

important in policy formulation and in certain cases highly desirable. A community may always chose between more product (efficiency) and industry regionalization for social and welfare benefits. This does not seem to be the case, however, with the question at hand. Greece's problem, at least at this stage, is more the development of an economically sound industry, combined perhaps with the development of certain regions, than a dispersal policy that would serve other kind of objectives.

A meaningful policy of industry regionalization should (a) be assigned specific goals and (b) be tied up with concrete programs of regional development and the creation of new industrial-urban complexes able to offset, in terms of operating efficiency, the locational attraction of the Athens area. The latter implies (1) that the appropriate potential sites will be found and be specified as such in advance; (2) that the necessary industrial overhead services and social facilities will be developed in these locations and will be provided to the industry at competitive prices; and (3) that adverse transport cost differentials (including port facilities) with respect to movement of inputs and outputs will be offset, so that industrial firms established in the provinces and producing for the national market will

not be at a disadvantageous competitive position for their products.

In short, there is need for an action based on previous concrete planning of industrial locations. Industry regionalization in the case of Greece is not meaningful unless it is carefully planned and guided by predetermined norms and policy objectives. The assumption of the present policy that once monetary incentives to attract industry to the provinces are established, entrepreneurs will find the «optimum» location for their plants, may prove a not altogether correct. The latter outcome is most probable if we take into account the present level of the managerial capabilities of the average Greek entrepreneur and the fact that the adopted measures have no reference whatsoever to structural factors which influence the location of manufacturing industry. Moreover, an approach of this type to the decentralization problem of Greek industry requires the consideration of each particular case (firm or industry) in the light of all the considerations of economic location involved. The need is therefore for detailed study of the «gains» and «losses» which the various alternative locations imply for individual manufacturing firms. It is only in the light of such concrete studies that programs of subsidization of specific industrial locations should be undertaken.

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